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REMEDIATION DIVISION, PCB PROGRAM, AND
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  - For Remediation Filings: **REM_REMID #_SiteAddress_Town_DocumentType_DateofDocument**
  - For LUST Filings: **LUST_SiteAddress_Town_AbbreviationForDocumentType_DateofDocument**
  - For PCB Filings: **PCB_SiteAddress_Town_AbbreviationForDocumentType_DateofDocument**
  Example: LUST_1MainStreet_Hartford_ESA_01-01-2001
  Note: For "AbbreviationForDocumentType" use appropriate abbreviation at Transmittal of Documents
- If no Rem ID assigned (new filing) or REM ID is unknown leave field blank

Part I: Primary Recipient*: Remediation Program (* required)

For Remediation documents:	For PCB/LUST documents:
Primary Program*: Voluntary Remediation	UST Facility ID: (if applicable)
Rem ID*: 14385	Spill Case Number: (if known)

Part II: Site Information

Site Name*: Western Middle School
Site Address*: 1 Western Junior Highway
City/Town*: Greenwich State: CT Zip Code: 06830

Secondary Programs (complete as many as applicable for this document):

Program: Select Secondary Program	Project ID:
Program: Select Secondary Program	Project ID:
Program: Select Secondary Program	Project ID:
Program: Select Secondary Program	Project ID:

Provide Project ID for each secondary program if it is known.
Each program has a unique ID (i.e. Rem ID, Spill Case #, UST Facility ID, etc.)

Part III: Document Information (document type required for appropriate program[s] only)

Remediation*: Remedial Action Plan
LUST/PCB*: LUST/PCB Document Type
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Part IV: Submitter Information

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Langan Engineering

REMEDIAL ACTION PLAN

for

WESTERN MIDDLE SCHOOL
1 Western Junior Highway
Greenwich, Connecticut

Prepared For:

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Greenwich, Connecticut 06830

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LIST OF ACRONYMS

AOC	Area of Concern
Bgs	Below ground surface
BMP	Best management practice
C-O-C	Chain-of-custody
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COC	Constituent of concern
CT	Connecticut
DEC	Direct Exposure Criteria
DEEP	Department of Energy and Environmental Protection
DPH	Department of Public Health
DOT	Department of Transportation
EC	Engineered Control
ETPH	Extractable total petroleum hydrocarbons
EUR	Environmental Use Restriction
GPS	Greenwich Public Schools
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHRA	Human Health Risk Assessment
I/CDEC	Industrial/Commercial DEC
LEP	Licensed Environmental Professional
mg/kg	Milligrams per kilogram
Msl	Mean sea level
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photoionization Detector
PMC	Pollutant Mobility Criteria
RAAR	Remedial Alternatives Analysis Report
RCRA	Resource Conservation Recovery Act
RSR	Remediation Standard Regulations
SVOC	Semi-volatile organic compound
TSCA	Toxic Substances Control Act
UST	Underground storage tank
VOC	Volatile organic compound
WMS	Western Middle School

1.0 INTRODUCTION

Langan CT, Inc. (Langan) has prepared this Remedial Action Plan (RAP) on behalf of Greenwich Public Schools (GPS) for the Western Middle School (WMS) property located at 1 Western Junior Highway in Greenwich, Connecticut (the "Subject Property"). The Subject Property is owned by the Town of Greenwich and is improved with grass athletic fields and recreational area that are part of the WMS. A Site Location Map is provided as Figure 1 and a Site Plan and Existing Conditions map, depicting pertinent site features, is provided as Figure 2. The Subject Property was enrolled into the Connecticut Department of Energy and Environmental Protection (CTDEEP) Voluntary Remediation Program (VRP) on 15 June 2020 (Remediation ID No. 14385) following submission of an Environmental Conditions Assessment Form (ECAF) pursuant to Connecticut General Statutes (CGS) Section 22a-133x.

The objective of this RAP is to address historic impacts to soil at the Subject Property's athletic fields (AOC-1) and recreational area (AOC-2) and is being submitted in accordance with the requirements of a risk-based cleanup and disposal under the Toxic Substances Control Act (TSCA), as described in Chapter 40 of the Code of Federal Regulations (CRF) Section 761.61(c), and the VRP, as defined by the CGS Section 22a-133x.

This RAP presents an evaluation of remedial alternatives and recommends a proposed remedial approach that demonstrates compliance for soil impacts exceeding the CTDEEP Remediation Standard Regulations (RSR) Criteria, Regulations of Connecticut State Agencies (RCSA) 22a-133k-1 through 3. The proposed remedial approach includes soil excavation and off-site disposal, construction of Engineered Controls (ECs), and placement of an Environmental Use Restriction (EUR) on the Subject Property.

1.1 Site Setting and History

The Subject Property is approximately 21.4-acre parcel identified as Tax ID 057 04-4519/S by the Town of Greenwich Assessor's office. The athletic fields and recreational area, referred to throughout this report as areas of concern AOC-1 and AOC-2, respectively, are located on the northeastern portion of the Subject Property and total an approximately 10.4-acre portion of the larger 21.4-acre parcel. The Subject Property is bound to the northwest by a wooded area followed by residential properties, to the north/northeast by a wooded area followed by the Town of Greenwich's Holly Hill Resource Recovery Facility and Muskrat Pond Drive, to the east/southeast by wooded areas followed by several commercial properties, and to the south/southwest by an asphalt-paved parking area and WMS building followed by Western Junior Highway. The athletic fields are situated on an elevated plateau with grades approximately 10 to 20 feet higher than that of the WMS buildings and the recreational area. Utilities provided to the Subject Property include municipal water, stormwater drainage and sanitary sewer, electricity,

and communications. Heating is provided by oil-fired boilers; fuel oil for heating is stored on-site in three underground storage tanks (USTs) (5,000-gallon, 7,500-gallon, and 8,000-gallon in size).

Prior to the 1960s, the Subject Property was undeveloped woodlands. During construction of the WMS in the early-1960s, the athletic fields at the Subject Property were filled and graded to meet final design grades using blasted rock (which may have been blasted on-site) and imported fill material of unknown origin. Based on a review of historical aerial photographs and topographic maps, the areas beneath the WMS buildings (which are located at elevations approximately 10 to 20 feet below the athletic fields) are believed to not have been constructed on the imported fill used on the elevated athletic fields. The Subject Property has been used exclusively as the WMS since its construction in the early 1960s.

1.2 Physical Setting

1.2.1 Topography

The Subject Property generally slopes up-gradient from west to east across the site with the WMS buildings and recreational area located on the western portion of the site being at a lower elevation than the athletic fields located on the eastern portion of the site. The athletic fields are located on an elevated plateau with grades approximately 10 to 20 feet higher than that of the WMS buildings and the grass-covered recreational area. The athletic field's elevation ranges between approximately 78 and 85 feet above mean sea level (msl) while the recreational area located to the northwest of the athletic fields and the WMS buildings located west of the athletic fields are at an elevation ranging between 58 and 61 feet above msl. Also, the northern edge of the Subject Property slopes down-gradient toward the adjacent Holly Hill Resource Recovery Facility and the southeastern edge of the Subject Property slopes up-gradient toward the adjacent commercial properties.

1.2.2 Geology

The subsurface conditions of the Subject Property have been determined following the completion of numerous investigations completed by Langan between 2016 and 2022. The subsurface at the athletic fields consists of a surficial layer of topsoil followed by a layer of fill overlying successive strata of blasted rock, glacial till, and bedrock. The subsurface at the recreational area located northwest of the athletic fields consists of topsoil followed by a layer of fill overlying glacial till, and bedrock. A more detailed description of each layer encountered is provided below:

Surficial Layer – Approximately 3 to 6 inches of topsoil.

Fill Layer – Beneath the athletic fields, the non-native fill material can generally be characterized as brown to dark-brown, coarse- to fine-grained sand, with some fine-gravel

and varying amounts of debris containing brick, charcoal, glass, ceramic, wood, metal, fibers, organic material, and construction and demolition debris. Although fill material was also observed beneath the grass-covered recreational area, located topographically down-gradient and to the northwest of the athletic fields, the composition of the fill within this area differed from that beneath the athletic fields and consists of silty sand with gravel, similar to the presumed native soils encountered at the Subject Property and may represent reworked native materials that had been moved during construction activities in the early 1960s. Further, this fill was not observed to contain the same deleterious material identified within the fill beneath the athletic fields. Across the athletic fields, the fill material has been encountered at depths ranging from 2 to 10 feet below grade surface (bgs).

Blasted Rock – A layer of blasted rock up to approximately 11-feet thick was encountered beneath the fill material throughout the athletic fields. It appears that prior to the import of fill material, grades at the athletic fields were first raised using rock that was likely blasted on-site. The layer of blasted rock observed beneath the fill material on the slope between the athletic fields and the down-gradient recreational area was generally observed at thicknesses ranging from 1 to 9 feet. Blasted rock was not observed beneath the recreational areas.

Till – Beneath some areas of the Subject Property, a layer of till was encountered beneath the blasted rock at the athletic fields and beneath the fill at the recreational area. The till is generally composed of brown to yellow-brown fine to coarse sand with varying proportions of silt, gravel, and cobbles and extends to depths ranging from 15 to 26 feet bgs.

Bedrock – Competent bedrock was encountered underlying the blasted rock and/or glacial till at the athletic fields. The top of the bedrock was inferred based upon auger refusal and split spoon samples. The bedrock underlying the site consists of gray mica schist and white gneiss, the top of which was encountered at depths ranging from 3.5 to 37 feet bgs, which is approximately between elevations 23 and 77 feet above msl.

1.2.3 Hydrogeology

According to the Water Quality Classifications Greenwich, CT map (CTDEEP, October 2017), the groundwater underlying the Subject Property is classified as GB. Based on the Connecticut Water Quality Standards and Criteria, class GB designated uses are industrial process water and cooling water, and base flow for hydraulically-connected water bodies; groundwater is presumed not suitable for human consumption without treatment. Overburden groundwater has been encountered on the southwestern portion of the athletic fields and western portion of the recreational area. Overburden groundwater was observed between 7 feet bgs at the southwestern portion of the athletic fields and 16.5 feet bgs at the western portion of the recreational area, which is approximately between elevations 66 and 39.5 feet above msl, respectively. Overburden groundwater has not been observed on the central or eastern portions

of the athletic fields; however, bedrock groundwater has been encountered in these areas. Bedrock groundwater was observed between 14 and 25 feet bgs at the central portion of the athletic fields and between 18.5 and 22 feet bgs at the eastern portion of the athletic fields, which is approximately between elevations 52 and 63 feet above msl on the central portion and 54 and 60.5 feet above msl on the eastern portion. The inferred bedrock groundwater flow direction is to the southwest.

The closest surface water body to the Subject Property is an unnamed stream located approximately 400 feet to the east of the Subject Property. The unnamed stream is classified as Surface Water Quality SB with designated uses as habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation. The stream empties into Byram Harbor, approximately 1,000 feet to the southeast, classified as Surface Water Quality SA. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. According to the National Wetlands Inventory online web viewer (https://www.fws.gov/wetlands/data/mapper.html), the closest wetlands are 1,600 feet to the southeast and classified as estuarine and marine.

1.3 Potential Constituent Migration Pathways

The primary migration pathways being assessed as part of remedial design are ingestion and dermal contact exposure pathways. Additional potential migration pathways to be considered for contaminated properties generally include; leaching of chemicals from impacted soils, groundwater transport through soil and subsurface conduits, and vapor migration through unsaturated soils. Based on subsurface investigations completed between 2016 and 2022, chemical impacts within the fill material at the Subject Property are not expected to be migrating off-site through groundwater migration or discharge to surface water.

Based on observations made at the Subject Property (and supplemented by a desktop review of the surrounding areas) risks to ecological communities have not been identified. This conclusion is based on the lack of sensitive environmental resources (i.e., habitat that could support and sustain an ecological community) at the Subject Property and in the surrounding vicinity. Given the current use of the Subject Property as a maintained athletic field and recreational area, ecological receptors are not likely to come in contact with site-related impacts given the lack of suitable habitat for foraging and nesting. Additionally, there are no sensitive environmental resources in the immediate vicinity of the Subject Property to which site-related impacts could potentially migrate. As such, ecological risk evaluations are not warranted at the site.

A drinking water well receptor survey was performed in 2018 and a Human Health Risk Assessment (HHRA) was submitted to the CTDEEP in 2016. The drinking water well receptor survey confirmed there are no water supply wells within a 500 foot radius of the Subject Property.

2.0 REGULATORY BACKGROUND

2.1 Voluntary Remediation Program

The Subject Property is enrolled in the CTDEEP VRP under CGS Section 22a-133x; therefore, the CTDEEP RSRs apply to the Subject Property and will be used as the remedial standards for site compliance. The analytical results for soil and groundwater obtained at the Subject Property are compared to the numeric criteria listed in the RSRs Sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies (RCSA) dated January 1996 (amended 16 February 2021), and to numeric criteria in the Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances (APS) and Certain Alternative Criteria dated 10 December 2015 (revised 20 September 2018). The RSRs were developed by the CTDEEP to define the remediation performance standards for soil, groundwater, specific numeric cleanup criteria, and processes for establishing alternative site-specific standards.

2.2 Remediation Requirements

Investigation of the Subject Property under the VRP requires adherence to the CTDEEP RSRs. The RSRs contain procedures and numeric criteria to evaluate whether remediation, institutional controls, and/or engineered controls will be required to abate identified petroleum products, hazardous substances and/or hazardous waste at the Subject Property. The RSRs require that the nature and extent of impacts be fully characterized prior to a final determination with respect to RSR compliance.

2.2.1 Soil Criteria

A soil release is defined by an area of soil exceeding either the analytical detection limit for a particular substance or site-specific background concentrations if the substance is naturally occurring. The RSRs define two criteria that apply to soil: the direct exposure criteria (DEC) and the pollutant mobility criteria (PMC). The DEC defines the maximum level of regulated substances allowed in soil, to a depth of 15 feet, without posing a threat due to direct human exposure, while the PMC sets the maximum level of regulated compounds allowed in soil without posing a threat to groundwater quality. Each criterion is further divided into two categories; the DEC is based on either residential sites or industrial/commercial sites, while the PMC is based on either GA/GAA or GB groundwater classification areas. The Subject Property is located within a GB groundwater classification area and is required to meet the GB PMC.

The residential DEC (RDEC) must be met unless an Environmental Use Restriction (EUR) is filed for the Subject Property. If a site or property is not to be used for residential purposes, and an EUR has been filed, then the industrial/commercial DEC (ICDEC) may be used in place of the RDEC.

The DEC does not apply if soil meets the definition of "inaccessible," and the PMC does not apply if soil meets the definition of "environmentally isolated". In either case, an EUR is required. Based upon the Subject Property's use as a school and it being located within a GB classified area, the applicable soil criteria for the Subject Property is the RDEC and the GB PMC.

2.2.2 Groundwater Criteria

The RSRs define three criteria that apply to groundwater: the groundwater protection criteria (GWPC), the surface water protection criteria (SWPC), and the groundwater volatilization criteria (GWVC). Contaminated groundwater in a GB area must comply with the SWPC and the GWVC. Additionally, contaminated groundwater within a GB area must comply with the GWPC when the use of groundwater in the area is for drinking or other purposes.

A Water Supply Well Receptor Survey was completed in April 2018 which identified no water supply wells or aquifer protection areas are located within 500 feet of the Subject Property. As such, in accordance with CGS Section 22a-133k-3(d)(1), because the groundwater in the area is not used for drinking or other purposes, the applicable groundwater criteria for the Subject Property is the SWPC and the GWVC.

The SWPC applies to groundwater that is discharging to a surface water body, including wetlands, streams, rivers, ponds, lakes, and the Long Island Sound. The SWPC was established to protect surface water from impacted groundwater discharges. One standard has been set for all surface water bodies, regardless of quality classification. The SWPC specifies the levels of compounds allowable in groundwater just prior to discharging into surface water. Compliance with the SWPC can be established with the 95% upper confidence level (UCL) of the plume or the portion of the plume immediately up-gradient of the discharge point to the surface water body meeting the applicable criteria. The RSRs also allow the calculation of an alternative SWPC, based on available dilution in the receiving water body.

The GWVC sets the allowable levels of volatile organic compounds (VOCs) in groundwater that is less than 15 feet below grade. The GWVC is designed to protect humans from exposure to VOCs present in shallow groundwater. Residential and industrial/commercial GWVC have been established, with the residential GWVC (RVC) being more stringent, and the industrial/commercial GWVC (ICVC) requiring the use of an EUR. The RSRs also establish Soil Vapor Volatilization Criteria (SVVC), which can be used as an alternative means of demonstrating compliance with the GWVC. If groundwater concentrations are above the GWVC, soil gas beneath a building can be analyzed to determine if VOC concentrations are below the SVVC. If groundwater concentrations exceed the GWVC but soil gas concentrations are below the SVVC, then there is no exposure hazard.

The RSRs also provide self-implementing alternatives as well as engineered controls to demonstrate compliance with the various soil, groundwater, and soil vapor criteria.

2.2.3 Applicable RSR Criteria

RSR criteria applicable to the Subject Property include the RDEC, GB PMC, SWPC, and the RVC. In order to provide site verification, compliance with these criteria must be demonstrated for the constituents of concern (COCs) identified at Subject Property.

2.3 Required Public Notification

Public notice will be made for remedial activities in accordance with the Connecticut RSRs and RCSA regulations. The public notification process will be conducted in accordance with CGS §22a-133x (i) and RSR §22a-133k-1(d). A public notice of remediation activities will be placed in the Greenwich Times and notification will be made to the director of the Greenwich Health Department. The notice will allow for a minimum of 45 days for public comment on the RAP. Additionally, notice of the planned remediation activities will be mailed to each owner of record of each property that abuts the WMS property, and a six-foot by four-foot sign will be posted at the school that is visible from Western Junior Highway stating that a RAP has been submitted to DEEP for the site. In accordance with the referenced general statute and regulation, the site will be posted for a minimum of 30 days following RAP submittal and includes a name and telephone number of a person who can provide additional information about the project. In addition, the Town has an ongoing public outreach program which includes publication of periodic informational updates that are posted on the GPS website and distributed through an electronic newsletter to parents, students, and members of the community who have previously expressed interest in the remediation project. A template of public notice materials is provided as Appendix E. Copies of final public notice materials along with publication date will be submitted with an EC Application Confirmation of Public Notice transmittal form.

3.0 ENVIRONMENTAL INVESTIGATIONS

Release identification, groundwater and soil vapor monitoring, and delineation activities have been completed at the Subject Property between June 2016 and March 2022. Impacts to soil at the Subject Property are attributed to historic fill imported to the Subject Property to raise grades at the athletic fields and recreational area during construction of the Western Middle School during the early 1960s. The following sections summarize the Environmental Site Investigations (ESI) completed by Langan at the Subject Property in the areas of proposed remediation.

3.1 June 2016 Limited Phase II ESI

In June 2016, the building committee for the New Lebanon School (a Greenwich public school serving students, kindergarten through 5th grade) was evaluating the construction of a temporary swing space for its students on the grass-covered recreational area of the Subject Property. As part of the evaluation, Langan was engaged to evaluate potential environmental concerns in the proposed construction area. The initial evaluation included the collection of three subsurface soil samples (at 2 to 2.5 feet bgs) for analysis of VOCs, SVOCs, PCBs, pesticides, herbicides, extractable petroleum hydrocarbons (ETPH), and metals; and the collection of eight surficial soil samples (0 to 6 inches bgs) for analysis of metals.

Langan used the RSRs, specifically the RDEC, as a screening level criterion to identify driver compounds that may require additional assessment. Arsenic was identified above the RDEC at depths ranging from 0 to 6 inches at two locations and from 2 to 2.5 feet bgs at one location. PCBs were detected in the three soil samples collected from 2 to 2.5 feet bgs at concentrations ranging from 0.0533 to 0.275 milligram per kilogram (mg/kg), below the RDEC of 1 mg/kg. The analytical results of the June 2016 investigation are summarized in Tables 1A and 1B and are shown on Figure 3A.

Based on the results of the sampling completed for the proposed New Lebanon swing space, Langan completed a HHRA to provide a site-specific evaluation of potential health risks associated with the constituents identified in soils exceeding the RDEC. The HHRA was submitted to the Connecticut Department of Public Health (CTDPH) for review and comment. Following their initial review, the CTDPH requested that the remaining portions of the WMS athletic fields be tested and incorporated into the HHRA. Although WMS was no longer being considered as a swing space location for New Lebanon students, the GPS administration continued with the testing in order to finalize the HHRA as requested by the CTDPH.

3.2 July and August 2016 Surficial Soil Investigation

Langan conducted soil sampling at the athletic fields in July 2016, which included the advancement of 30 shallow soil borings and the collection of 30 surficial soil samples directly

below the grass cover (0 to 3 inches) for analysis of SVOCs, PCBs, pesticides, herbicides, and metals. Laboratory analytical results of the top 3 inches of surficial soils identified impacts from PCBs, arsenic, lead, and pesticides (chlordane) at concentrations exceeding the RDEC. The analytical results of the July and August 2016 investigation are summarized in Table 2 and are shown on Figure 3B.

The July 2016 investigation results were incorporated into a revised HHRA. Based on the results of the HHRA, the calculated site-specific risk values for receptors at the Subject Property fell within published USEPA acceptable ranges, indicating adverse health effects are unlikely to occur. However, in coordination with CTDPH, the GPS administration made the conservative decision to fence and close the fields until additional assessment could be completed and all appropriate parties provided input.

Upon discussion of the results, the GPS, Langan, CTDPH, and CTDEEP agreed to complete soil delineation for six areas of the Subject Property's athletic fields. Three of the proposed delineation areas (represented by soil sample locations SS-9, SS-22, and SS-24) were related to identified releases of lead and chlordane and the remaining three areas (represented by soil sample locations SS-28, SS-31, and SS-37) were related to PCB contamination.

3.3 October 2016 Lead and Chlordane Soil Delineation

Horizontal and vertical delineation sampling for the three previously identified lead and chlordane exceedances (represented by soil sample locations SS-9, SS-22, and SS-24) was conducted on 8 August 2016 and 7 October 2016 and included the advancement of 38 shallow soil borings. The analytical results of the October 2016 lead and chlordane delineation are summarized in Tables 3A and 3B and are shown on Figure 3C. The results of the delineation sampling were used to define the vertical and horizontal extent of soil excavation activities to remove elevated levels of lead and chlordane at the three areas. The results of the delineation sampling successfully defined the extent of remediation proposed for areas of the athletic fields with lead and chlordane-contaminated surficial soil. Delineation sampling determined elevated concentrations of the lead and chlordane were limited to surficial soils above 1 foot bgs.

Due to the discovery of elevated concentrations of PCBs and pesticides within shallow soil at the athletic fields during the July and August 2016 investigation, 16 shallow soil samples were collected within the recreational area for analysis of PCBs and pesticides as a part of the October 2016 delineation of lead and chlordane exceedances. The analytical results of the additional recreational area investigation are summarized in Tables 3C and 3D and are shown on Figure 3D. Chlordane and PCBs were detected above laboratory reporting limits but below the applicable CTDEEP criteria in shallow soil samples collected from the recreational area.

3.4 October 2016 through October 2017 PCB Soil Delineation

Horizontal and vertical delineation sampling for the three previously identified PCB exceedance areas (represented by soil sample locations SS-28, SS-31, and SS-37) began in October 2016 and continued through October 2017. Delineation of the three PCB exceedance areas included the advancement of more than 100 soil borings and the laboratory analysis of nearly 200 soil samples. The analytical results of the 2016 through 2017 PCB delineation are summarized in Tables 4A, 4B, and 4C and are shown on Figures 3E, 3F, and 3G. Soil delineation sampling at these three exceedance areas identified PCBs in historic fill at elevated concentrations (up to 543 mg/kg) ranging between 0 and 9 feet bgs. The results of the delineation sampling were used to define the vertical and horizontal extent of the proposed soil excavation activities to remove concentrations of PCBs in exceedance of 10 mg/kg at the three locations.

Based on the findings of the three PCB exceedance area delineations, it was determined further investigation of PCBs within historic fill both vertically and horizontally was needed across both the recreational area and athletic fields. In June 2017 Langan advanced 66 soil borings evenly spaced across the recreational area and the athletic fields to investigate the presence of PCBs in historic fill. The analytical results of the June 2017 PCB investigation are summarized in Table 5 and are shown on Figure 3H. Two soil samples between ground surface and 1 foot bgs were collected from each boring and submitted for analysis of PCBs. The investigation confirmed the presence of historic fill containing varying amounts of deleterious debris (i.e. construction and demolition debris, charcoal, ceramic) across the athletic field's portion of the Subject Property. PCBs at concentrations exceeding the RDEC (up to 21 mg/kg) were found in 7 of the 66 soil borings.

Following the receipt of initial delineation activities in October 2016, it was determined the fill area was subject to the Toxic Substances Control Act (TSCA) with regard to PCBs detected in soil at concentrations exceeding 50 milligrams per kilogram (mg/kg). Soil with PCB concentrations greater than or equal to 50 mg/kg are classified as PCB Remediation Waste in §761.3 of Chapter 40, Code of Federal Regulations, Part 761 (40 CFR Part 761). Because PCB concentrations at or above this level were identified within the historic fill layer at AOC-1, the GPS, the Town of Greenwich, and Langan worked with the USEPA Region 1 PCB Coordinator with regard to investigation and remediation of PCBs at the Subject Property.

On 23 January 2017, Langan submitted a Significant Environmental Hazard (SEH) Notification to the CTDEEP due to elevated concentrations of PCBs that were discovered in shallow soils during the PCB soil delineation sampling. SEHs are specific conditions defined in Section 22a-6u of the CGS, for which property owners have an obligation to notify the CTDEEP when they become aware of such conditions. These conditions are termed significant hazards because they pose a potential health risk from short-term exposure to individuals or the environment. Notification is

required to CTDEEP when soil within two feet of the surface has been reported to contain a constituent at a concentration at or above 15 times the residential DEC.

Based on the sampling data received during the delineation of the three PCB exceedance areas it was determined PCB-contaminated soils extended beyond the athletic fields (to the north of SS-31 and to the east of SS37) and into the adjoining wooded slopes on the Subject Property.

3.5 October 2018 Supplemental Soil and Groundwater Investigation

Pursuant to discussions with the CTDEEP, the CTDPH, and the USEPA, supplemental environmental sampling was completed to evaluate the extent of PCB-impacted soils along the boundaries of the athletic fields, to further evaluate the nature and extent of the impacted fill material beneath the athletic fields, and evaluate the condition of the Subject Property's groundwater. The supplemental investigation included advancement of 13 soil borings, 24 hand auger borings, the installation of two overburden and two bedrock groundwater monitoring wells, the analysis of 108 soil samples and four groundwater samples. The analytical results of the October 2018 investigation are summarized in Tables 6A, 6B, and 6C and are shown on Figures 3I and 3J.

The supplemental soil investigation determined historic fill is present throughout the athletic fields and extends to the adjacent areas surrounding the athletic fields to the north, south, and east on the Subject Property. The historic fill contained concentrations of VOCs, SVOCs, pesticides, metals, and PCBs at concentrations exceeding the RDEC and GB PMC. The sampling data showed concentrations of contaminants generally decreased as you move further away from the athletic fields.

Two overburden groundwater monitoring wells were installed on the western portion of the Subject Property; one at the southern edge of the athletic fields and one at the southwestern edge of the recreational area. Overburden groundwater was observed between 9 feet bgs (athletic fields) and 16.5 feet bgs (recreational area). Two bedrock groundwater monitoring wells were installed on the eastern portion of the Subject Property; one on the northcentral portion of the athletic fields and one on the northeastern portion of the athletic fields. Bedrock groundwater was observed at 22 feet bgs (northcentral athletic fields) and 18.5 feet bgs (northeastern athletic fields). VOCs, ETPH, and various metals were detected above laboratory reporting limits but below applicable CTDEEP criteria in groundwater. SVOCs, pesticides, herbicides, and PCBs were not detected above laboratory reporting limits in groundwater. The contaminants encountered in soils were not identified in groundwater exceeding the applicable criteria. Given that the athletic fields have been open to infiltration since placement of the fill in the early-1960s, the results indicate the contaminants present in the fill material are not leaching into groundwater at concentrations that would warrant action.

Langan completed a Water Supply Well Receptor Survey on 25 April 2018, prior to the October 2018 soil and groundwater investigation. The survey confirmed there are no water supply wells within a 500 foot radius of the Subject Property.

3.6 September 2020 Soil and Groundwater Investigation

Following enrollment into the CTDEEP VRP on 15 June 2020, the CTDEEP requested further assessment of the historic imported fill material to confirm it did not extend west of the athletic fields and below the WMS buildings. The investigation was completed between 2 and 17 September 2020 and included the advancement of five soil borings, the installation of three bedrock groundwater monitoring wells, and the collection of five soil samples and three bedrock groundwater samples. The analytical results of the September 2020 investigation are summarized in Tables 7A and 7B and are shown on Figures 3K and 3L.

Five soil borings were advanced along the western boundary of the athletic fields between the fields and the WMS buildings. Historic fill was not observed within any of the five soil borings and laboratory analytical results did not identify any non-naturally occurring compounds above background within soil. Based on the investigation the historic fill material and its related contaminants do not extend below the WMS buildings.

Three bedrock groundwater monitoring wells were installed on the western portion of the athletic fields. Like the previously installed bedrock groundwater monitoring wells on the eastern portion of the athletic fields, water bearing fractures within bedrock varied by location. Bedrock groundwater was observed between 13 and 25 feet bgs on the western portion of the athletic fields. Laboratory analytical results of groundwater samples identified VOCs and various metals above laboratory reporting limits but below the applicable CTDEEP criteria. PCBs, pesticides, and herbicides were not detected above laboratory reporting limits. Groundwater investigation data was found to be consistent with the previous investigations, indicating the contaminants present in the fill material were not leaching into groundwater at concentrations that would warrant action.

3.7 August 2021 Soil Delineation Investigation

Following discussion and review of previously completed investigations, the CTDEEP requested that additional soil delineation activities be completed at the Subject Property. The primary objective of the August 2021 soil delineation investigation was to further define the nature and extent of historical fill-related contamination along the boundaries of the Subject Property's athletic fields. The delineation investigation was completed between 16 and 23 August 2021 and included the advancement of 32 soil borings, the excavation of seven test pits, and the collection and analysis of 63 soil samples. The analytical results of the August 2021 investigation are summarized in Table 8 and are shown on Figure 3M.

The 32 soil borings were installed along the boundaries of the athletic fields to the north, south, east, and west. Two soil samples were collected from each soil boring between 0.5 and 7 feet bgs. Laboratory analytical results identified VOCs, SVOCs, pesticides, metals, and PCBs at concentrations exceeding the applicable CTDEEP criteria within historic fill to depths of 4 feet bgs at the boundaries of the athletic fields.

Seven test pits were advanced within a mounded area on the southeast-central portion of the athletic fields to determine what the mound was comprised of. Langan observed the mound consisted of 10 to 12 inches of topsoil underlain by historic fill material followed by blasted rock and bedrock.

3.8 March 2022 Soil, Groundwater, and Soil Vapor Investigation

Based on the findings of August 2021 soil delineation investigation, the CTDEEP requested that additional soil delineation activities be completed to further define the nature and extent of historical fill-related contamination along the border of the Subject Property's athletic fields and parcel boundary. In addition to further soil delineation activities, the CTDEEP also requested the installation and sampling of groundwater monitoring wells and soil vapor monitoring points to assess the concentrations of VOCs in groundwater and soil vapor in the vicinity of the Western Middle School building for use in the evaluation of the volatilization pathway and potential risk.

The investigation was completed between 18 February and 15 March 2022 and included the advancement of 28 soil borings and the collection and analysis of 30 soil samples, the installation of three groundwater monitoring wells and the collection and analysis of five groundwater samples, and the installation of three soil vapor monitoring points and collection and analysis of three soil vapor samples. The analytical results of the March 2022 investigation are summarized in Tables 9A, 9B, and 9C and are shown on Figures 3N and 3O.

The 28 soil borings were installed using stainless steel hand augers along the boundaries of the athletic fields and along the parcel boundary. Laboratory analytical results identified SVOCs, pesticides, metals, and PCBs at concentrations exceeding the applicable CTDEEP criteria to depths of 2 feet bgs at the boundaries of the athletic fields. Historic fill material consistent with the material underlying the athletic fields was only observed within 4 of 22 soil borings located along the Subject Property parcel boundary and/or along the toe of the slope that extends along the perimeter of the athletic fields, further delineating the extent of impacted historic fill material and future remedial excavations.

The three groundwater monitoring wells and three soil vapor monitoring points were installed southwest of the athletic fields along the exterior of the Western Middle School building. Groundwater samples were collected from the three newly installed monitoring wells as well as two existing monitoring wells located along the exterior of the Western Middle School building. VOCs were not identified in groundwater or soil vapor at concentrations exceeding applicable

RSR criteria. Groundwater investigation data was found to be consistent with the previous investigations, indicating the contaminants present in the fill material were not leaching into groundwater at concentrations that would warrant action. Soil vapor analytical results indicate that vapor intrusion mitigation will not be required for the Western Middle School building.

4.0 CONCEPTUAL SITE MODEL

Used for evaluating investigation and remedial actions at a site, the Conceptual Site Model (CSM) incorporates site-specific and hydrological information to identify COCs, the nature and extent of impacts, migration and exposure pathways, and potential points of exposure. The conceptual model of a site contains sufficient information to: (1) identify sources of the impacts; (2) determine the nature and extent of the impacts; (3) identify the dominant fate and transport characteristics of the Site; (4) specify potential exposure pathways; and, (5) identify potential receptors that may be impacted.

The CSM has been developed to evaluate the impacts identified in site soils and groundwater, resulting from on-site releases of contaminants, and how these compounds may interact with the environment, wildlife, and humans. Langan's investigations between 2016 and 2022 have included the collection of more than 600 soil samples, 12 groundwater samples, and three soil vapor samples analyzed for COCs from across the Subject Property.

As outlined in previous sections of this report, fill material imported in the early-1960s is the primary source of contamination beneath the Subject Property. COCs identified in the fill include VOCs, SVOCs, pesticides, metals, and PCBs; however, PCBs have been determined to be the main driver for delineation and remediation activities at the Subject Property. Although pesticides have also been identified in surficial soils, pesticide impacts are likely the result of grounds-keeping activities, and likely not inherent to the fill material brought to the Subject Property.

Previous investigations have identified two distinct Areas of Concern (AOC) at the Subject Property, the athletic fields (AOC-1) and the recreational area (AOC-2). Historic fill containing COCs in exceedance of the RDEC and GB PMC is present at both AOC-1 and AOC-2; however, the historic fill observed underlying AOC-1 and AOC-2 are distinctly different, as described below.

AOC-1 – Historic Fill

Investigations of AOC-1 have found a layer of historic fill extending between 0.5 and 10 feet bgs with the general depth of historic fill increasing from southwest to northeast across AOC-1. Based on a review of historical aerial photographs and topographic maps we believe the fill material was imported to the Subject Property to raise grades at the athletic fields during the construction of the WMS in the early 1960s. The historic fill underling AOC-1 contains varying amounts of deleterious materials including brick, charcoal, glass, ceramic, wood, metal, fibers, organic material, and construction and demolition debris. Investigations have found VOCs, SVOCs, pesticides, metals, and PCBs exceeding the RDEC and/or GB PMC within the historic fill layer underlying AOC-1. Delineation sampling has found these COCs are limited to the historic fill layer and have not migrated down into the underlying native soils.

AOC-2 – Historic Fill

Investigations have found a shallow layer of fill extending between 0.5 to 3 feet bgs underlying AOC-2. Based on a review of historical aerial photographs and topographic maps we believe the historic fill observed at AOC-2 is primarily reworked on-site material, placed and graded during construction of the WMS in the early 1960s. This fill was observed consisting of silty sand with gravel, similar to the presumed native soils, and did not contain the same deleterious material identified within the fill beneath AOC-1, suggesting two different source material locations. Investigations of AOC-2 have found the metal arsenic at concentrations exceeding the RDEC and the pesticides 4,4'-DDT and chlordane at concentrations exceeding the GB PMC at select locations. The varying COCs and elevated concentrations found within historic fill at AOC-1 were not found within the fill layer at AOC-2.

4.1 Impact Sources, Mechanisms, and Migration Pathways

The impact sources for the Subject Property have been fully investigated and found to be limited to the historic fill material and historic grounds-keeping operations at both AOC-1 and AOC-2. Potential migration pathways at the Subject Property include releases from historic fill, volatilization from historic fill, leaching from the historic fill and transport to groundwater, and/or migration via groundwater.

As previously stated, delineation of the historic fill at both AOC-1 and AOC-2 has not found COCs migrating out of the historic fill and into the underlying native soils. Both overburden groundwater and bedrock groundwater aquifer samples have been collected and analyzed for site-specific COCs at the Subject Property. The COCs encountered in soils were not identified in any of the groundwater samples collected at concentrations exceeding the SWPC or RGWVC. Given both the AOC-1 and AOC-2 areas have been open to infiltration since the placement of the historic fill in the early 1960s, the analytical data suggests the COCs present within the fill have never, or are no longer, leaching into groundwater at concentrations that would warrant regulatory action.

4.2 Exposure Pathways

Exposure pathways associated with soil impacts at the Subject Property is limited to direct contact with impacted soil.

Under Current Conditions

Exposure pathways under existing conditions are limited to incidental ingestion of soil, dermal exposure to soil, and inhalation of fugitive dust from wind erosion of soils to a depth of 0.5 feet bgs. Following discovery of elevated concentrations of COCs within soil in 2016 the athletic fields were closed by the CTDPH and GPS and a perimeter fence was constructed around the athletic fields to limit site access. The closure of the athletic fields and construction of the perimeter

fencing have limited current exposure pathways to inhalation of fugitive dust from wind erosion of soils to a depth of 0.5 feet bgs.

During Construction/Remediation Activities

Exposure pathways during construction and remediation activities would be limited to on-site construction and remediation workers and would include incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dust during excavation and grading operations. Best management practices will be implemented during construction and remediation activities to limit exposure pathways to on-site personnel, including but not limited to the monitoring and mitigation of fugitive dust and safe material handling practices.

Post-Remediation Conditions

Post-remediation exposure pathways will be limited due to the implementation of engineered and institutional controls. Engineered controls will be constructed to render remaining impacted soils inaccessible and physically isolated from human contact and an EUR will be placed on the Subject Property that will prohibit actions that would disturb the ECs or expose remaining impacted soil. Exposure pathways would be limited to on-site construction and remediation workers during controlled excavation activities that breach the ECs and would include incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dust. These excavation activities would be managed in accordance with the EUR and would include the monitoring and mitigation of potential exposure.

4.3 Ecological Assessment

Based on observations made at the Subject Property (and supplemented by a desktop review of the surrounding areas) risks to ecological communities have not been identified. This conclusion is based on the lack of sensitive environmental resources (i.e., habitat that could support and sustain an ecological community) at the Subject Property and in the surrounding vicinity. Given the current use of the Subject Property as a maintained athletic field and recreational area, ecological receptors are not likely to come in contact with site-related impacts given the lack of suitable habitat for foraging and nesting. Additionally, there are no sensitive environmental resources in the immediate vicinity of the Subject Property to which site-related impacts could potentially migrate. As such, ecological risk evaluations are not warranted at the site.

A down-gradient wetland located adjacent to the north of the Subject Property was assessed by All-Points Technology Corporation (APTC) Senior Wetland Scientist, Dean Gustafson. Mr. Gustafson found the delineated wetland is an isolated feature that has been subject to historic disturbances from nearby properties as evident by the dominance of invasive species that exist in the surrounding uplands as well as the stormwater discharges and culverted outlet from this small isolated wetland. The surrounding influences result in diminished ecological integrity to the

wetland system and limit its ability to service typical functions and values making the wetlands primary function water quality treatment principally associated with stormwater runoff. Mr. Gustafson reports the proposed construction and remediation activities would not have an adverse effect to the small isolated wetland nor would it significantly diminish its capacity to provide its principal function of stormwater renovation.

5.0 AOC-1 REMEDIAL ALTERNATIVES

The following sections present various remedial alternatives to address the contamination at the Subject Property's athletic fields (AOC-1). The contamination at AOC-1 is attributed to historic fill material containing various COCs including VOCs, SVOCs, pesticides, metals, and PCBs at concentrations exceeding the CTDEEP RDEC and/or GB PMC. Although multiple COCs are present within the historic fill at AOC-1, PCBs have been the main driver for delineation and remedial activities due to the correlation between the presence of PCBs within soil samples and the presence of historic fill material containing COCs at concentrations exceeding the RDEC and/or GB PMC.

Alternatives for the remediation of AOC-2 were not necessary due to the limited presence of impacted soil within AOC-2. The proposed remedial approach for AOC-2 is provided in Section 7.2 of this RAP and includes this excavation and off-site disposal of soil containing COCs at concentrations exceeding CTDEEP RSR criteria. The remedial alternatives for AOC-1 presented in this Section all assume the remediation of AOC-2 in accordance with the remedial approach provided in Section 7.2.

Unrestricted compliance with the RDEC and GB PMC would require the excavation and off-site disposal of all historic fill underlying AOC-1. This approach is not feasible due to the volume of material and the significant costs associated with the excavation and disposal of such material. The cost for excavation and off-site disposal of all historic fill underlying AOC-1 is estimated to be approximately $38,700,000 and it is estimated that it would take approximately 374 working days to complete.

Although remedial technologies may be applied to treat PCBs and other COCs with the approval of the EPA and the CTDEEP, implementing in-situ and/or ex-situ technologies requires extensive testing and permitting to confirm effectiveness. In reality, remedial technologies to effectively treat PCBs in soil are not economical for the Subject Property. Due to restrictions in future site uses, limitations in remedial technologies, and the significant costs, remediation to unrestricted compliance with the RDEC and GB PMC at AOC-1 was found to be infeasible. As such, the most appropriate remedial actions for AOC-1 will require a combination of impacted soil removal, the use of an engineering control variance, and an EUR in order to achieve compliance with the RSRs.

In accordance with Section 22a-133k-2(f)(2)(A) of the CTDEEP RSRs, the remediation of AOC-1 can achieve compliance with the RDEC through the use of an engineered control variance, pending CTDEEP Commissioner approval of the following:

- The cost of remediating the polluted soil at the subject release area is significantly greater than the cost of installing and maintaining an engineered control for such soil and conducting groundwater monitoring (22a-133k-2(f)(2)(A)(iv) of the CTDEEP RSRs)

- The cost of remediating the polluted soil at the subject release area significantly outweighs the risk to the environment and human health if the engineered control fails (22a-133k-2(f)(2)(A)(v) of the CTDEEP RSRs)

In accordance with Section 22a-133k-2(c)5(C) of the CTDEEP RSRs, the remediation of AOC-1 can achieve compliance with the GB PMC by applying the PMC Conditional Exemption, pending CTDEEP Commissioner approval of the following:

- Eighty (80) percent or more of the mass of the substances remaining at the release area has been subject to infiltration (22a-133k-2(c)5(C)(i) of the CTDEEP RSRs)
- Infiltration was not obstructed by anthropogenic features, for at least five (5) years (22a-133k-2(c)5(C)(ii) of the CTDEEP RSRs)
- Groundwater monitoring complies with the requirements of Section 22a133k-3(h)(1) of the CTDEEP RSRs (22a-133k-2(c)5(C)(iii) of the CTDEEP RSRs)
- The laboratory analytical results for all groundwater sample events collected as specified in Section 22a-133k-3(h)(3) of the RSRs are equal to or less than the SWPC (22a-133k-2(c)5(C)(iv) of the CTDEEP RSRs)

Remedial excavation to achieve compliance with the numerical criteria for the Subject Property is infeasible due to the significant costs and site limitations associated with excavating and disposing of all historic fill underlying AOC-1. To achieve compliance with the CTDEEP RSRs the use of an EC Variance and PMC Conditional Exemption is necessary. Based on the requirements set forth in Sections 22a-133k-2(f)(2)(A) and 22a-133k-2(c)5(C) of the CTDEEP RSRs, the use of an EC Variance and PMC Conditional Exemption is applicable for the Subject Property.

The three remedial alternatives presented in the following sections assume the excavation and off-site disposal of varying volumes of impacted historic fill underlying AOC-1, the construction of ECs to prevent direct contact to and render inaccessible remaining impacted soil with exceedances of the RDEC through use of an engineered control variance in accordance with 22a-133k-2(f)(2)(A) of the CTDEEP RSRs, and the use of the PMC Conditional Exemption to achieve compliance for remaining impacted soil with exceedances of the GB PMC in accordance with 22a-133k-2(c)5(C) of the CTDEEP RSRs.

The following assumptions were made in the development and cost estimating associated with these remedial alternatives:

- Restoration activities will be consistent with current site use. Specifically, the site will continue to function as a school, and the athletic fields and recreational area will be restored to current use and improved conditions.
- The remediation and construction work week was assumed to be limited to Monday through Friday, with 10-hour workdays (7am through 5pm).

- 30 trucks could be used to haul waste from the site daily as a maximum, with an equal number of trucks used to bring clean backfill to the Subject Property (an average of 30 waste hauling and backfill deliveries each day, 60 total per day or 6 per hour). Each truck can haul 22 tons (limited by weight restrictions for travel on state roads); therefore 660 tons could be removed daily and equivalent quantities of backfill would be brought to the site.
- For smaller or shallower excavations, only 440 tons could be removed daily. This lower estimate is assumed because shallower excavations would require more movement of equipment to perform the excavation and support materials involved in the remediation.
- The estimated time to perform the remedial work is calculated by dividing the total amount of soil to be removed by the amount of soil that can be removed each work day.
- The density used for conversion from cubic yards to tons was 1.7 tons per cubic yard.
- Transportation & disposal costs are subject to varying market conditions, and therefore, may be subject to cost increases at the time that work is to be conducted.
- Costs have not been estimated for relocating school operations from the property but are assumed to be significant, and no alternative site in the Town of Greenwich is available for use.
- Site restoration activities including the construction of artificial turf fields may be performed during the school semesters.

Detailed quantity, unit costs, and cost estimate tables for each of the Remedial Alternatives are provided in Appendix A and the estimated potential cost for each alternative is included on Table 10. The total cost estimated uses the assumptions listed above and costs for services, labor, materials and equipment such as soil disposal, backfill, and site restoration. The estimates have been prepared for the purposes of preliminary budgeting to identify any significant cost differences between alternatives. Changes in cost elements are likely to occur as a result of new information and data to be collected during any pre-remedial investigation and engineering design. Prior to and during remediation, there will likely be changes in the unit rates and costs for services, labor, materials, and equipment that will lead to changes in the final cost of the project. Additional changes in costs may result from changes in quantities and unknowns that may be encountered during remediation.

5.1 Remedial Alternative Evaluation Criteria

Each remedial alternative is evaluated against two threshold criteria and seven balancing criteria. Threshold criteria must be met for a remediation alternative to be considered feasible. Balancing

criteria are used to further evaluate the practicality of each remediation alternative. The evaluation criteria are discussed below.

Threshold Criteria

1. *Overall Protection of Human Health and the Environment* – A threshold criterion that considers how the remedial alternative prevents or mitigates potential risks.
2. *Compliance with Applicable Regulations* – A threshold criterion that addresses whether the remedial alternative will meet cleanup criteria established by applicable regulations, including the CTDEEP RSRs and USEPA TSCA.

Balancing Criteria

1. *Long-term Effectiveness and Permanence* – An evaluation of the magnitude of residual risk remaining after implementation of the remedial alternative and the reliability of any controls required to reduce the risk.
2. *Reduction of Toxicity, Mobility, or Volume* – An evaluation of the ability of the remedial alternative to reduce the amount of impacted materials present or prevent further releases or migration of contamination.
3. *Short-term Effectiveness* – An evaluation of the time until the remedial alternative can be completed and effectiveness of measures required to remain protective of the community and site workers during the implementation of the remedial alternative.
4. *Implementability* – An evaluation of the anticipated ability to permit, construct, operate, and monitor a remedial alternative.
5. *Cost-Effectiveness* – An evaluation of the costs associated with a remedial alternative which includes costs to implement the alternative and costs for long-term operation and maintenance of the alternative.
6. *Regulatory Acceptance* – An evaluation of potential acceptance by State and federal regulatory authorities based upon historical precedence.
7. *Community Acceptance* – An evaluation of potential impacts to the community and the anticipated response of the community based upon historical comments received from the public.

5.2 Remedial Alternative 1

This risk-based remedial alternative consists of the excavation and off-site disposal of historic fill underlying AOC-1 to a depth of four feet, excavation and off-site disposal of soils where PCB concentrations are known to exceeded 10 mg/kg regardless of depth, and the construction of ECs to existing grades over remaining impacted soils. This remedial alternative would remove all

soils exceeding the CTDEEP criteria in accessible soils; accessible soils are defined as the top two feet of soils underlying contact-limiting surfaces (i.e. bituminous concrete, permanent structure) and the top four feet of soils underlying areas of natural cover. Remedial excavation locations and depths for this remedial alternative are presented on Figure 4. Implementation of this remedial alternative would involve:

- Excavation and off-site disposal of historic fill underlying AOC-1 to a depth of four feet or to the underlying blasted rock, bedrock, or native soil layer should it be encountered first.
- Excavation and off-site disposal of all soil/fill containing PCBs greater than the Industrial/Commercial (I/C) DEC of 10 mg/kg, regardless of depth.
- The collection of confirmatory endpoint samples to confirm the remedial objectives have been achieved and to allow the documentation of remaining concentrations in the remedial action report and decision document for the EUR to further inform future site management decisions.
- Construction of ECs to render remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg inaccessible in accordance with 22a-133k-2(f)(2)(C) of the CTDEEP RSRs.
- Placement of clean fill over remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg to raise grades back to existing conditions. The placement of clean fill and the construction of ECs will total approximately four feet of clean material above remaining impacted soil.
- Placement of an EUR on the Subject Property that would prohibit actions that would disturb the ECs or expose remaining impacted soil in accordance with 22a-133k-2(f)(2)(c)(iii) of the CTDEEP RSRs.
- Application of the PMC Conditional Exemption to achieve regulatory compliance for remaining impacted soil with exceedances of the GB PMC in accordance with 22a-133k-2(c)5(C) of the CTDEEP RSRs.

Under this remedial alternative, excavation and off-site disposal volumes are estimated to be:

- Approximately 62,600 cubic yards (106,400 tons) of historic fill and soil with PCBs less than 10 mg/kg;
- Approximately 1,750 cubic yards (2,950 tons) of historic fill and soil with PCBs greater than 10 mg/kg but less than 50 mg/kg; and,
- Approximately 1,225 cubic yards (2,075 tons) of historic fill and soil with PCBs greater than 50 mg/kg.

The total remedial excavation area is approximately 438,153 square feet with excavations extending between four and nine feet bgs. Some excavations would require excavation controls (e.g., sloping and/or shoring) to maintain the safety of the excavation sidewalls and would extend to depths as practical, while avoiding risks associated with potentially compromising adjacent structures. Under Remedial Alternative 1, the lead and chlordane remediation areas would be removed as a consequence of the 4-foot deep remedial excavation across AOC-1.

Verification samples would be collected to determine that impacted soil is removed to the extent required to comply with applicable regulations and project approvals. Following excavation, the restoration of AOC-1 would involve the import of clean backfill to fill the excavations to the previous grades. It is estimated that an equivalent amount of backfill would be required to backfill the excavations.

The remedial excavation and backfill activities are estimated to take 189 work days. It is estimated that an average of 30 trucks hauling waste and 30 trucks hauling clean backfill would be required each work day to meet the estimated schedule. With a ten-hour work day, this is an average of 6 trucks per hour entering and leaving the site. The total estimated time to complete all remedial and construction activities is 252 days. The estimated cost for this alternative is $28,300,000.

5.2.1 Protection of Human Health and the Environment

This alternative is considered to be protective of human health and the environment via mitigating potential exposure to remaining impacted materials. Potential exposure to remaining impacted materials would be mitigated by:

- Direct exposure to historic fill material with elevated concentrations of COCs would be mitigated by the installation of a visible demarcation layer and construction of ECs above remaining impacted soil. In addition to ECs, clean fill would be placed at remedial excavation areas to raise grades back to existing conditions, totaling approximately four feet of clean fill and ECs above remaining impacted materials.
- The removal of all soils with PCBs greater than 10 mg/kg would eliminate the highest concentrations of PCBs from the property; therefore providing further protection to human health and environment.
- The placement of an EUR that would restrict intrusive activities and require protective measures be implemented if impacted soil were to be contacted.
- Regular inspection and maintenance of the ECs constructed over remaining impacted materials in order to maintain the integrity of the barriers.

5.2.2 Compliance with Applicable Regulations

Regulatory compliance for this remedial alternative is dependent on the acceptance of a risk-based approach. Federal EPA regulations under TSCA allow for risk-based remedial action in Code of Federal Regulations (CFR) §761.61(c). CTDEEP regulations do not have multiple provisions for PCBs above 1 mg/kg remaining in place at a school and would require Commissioner approval and/or variances to leave impacted soil in place under an EC in accordance with Section 22a-133k-2(f)(2)(C) of the CTDEEP RSRs. Additionally, this alternative would require the implementation of an EUR that would restrict intrusive activities, and an operation and maintenance (O&M) plan that would govern the inspection and maintenance of the ECs to ensure they remain protective.

With the installation of ECs and the placement of an EUR, this alternative complies with 40 CFR §761.61(a) under the following conditions:

- Inspection, maintenance and monitoring are performed and indicate no change in site conditions or migration of impacts left in place.
- Additional corrective measures are taken if inspection or monitoring indicates that they are necessary.
- Monitoring of groundwater indicates continued compliance with the applicable standards.

5.2.3 Long-Term Effectiveness and Permanence

This alternative is effective in the long-term and permanent as long as the ECs, long-term O&M plan, and EUR are maintained on the Subject Property.

5.2.4 Reduction of Toxicity, Mobility, or Volume

This alternative is effective in reducing the toxicity, mobility, and volume of chemical impacts at the Subject Property due to the extensive removal of soil impacts proposed under this excavation strategy. This alternative would remove impacted soil down to depths of at least four feet bgs as well as highly impacted soils below four feet with PCBs above 10 mg/kg, providing a significant reduction in exposure risk for site uses. Although chemical impacts within the fill material are not expected to be migrating off-site through groundwater migration or discharge to surface water; the quantity of impacted soil to be removed under this alternative greatly reduces the potential loading of chemical impacts on the environment. Potential groundwater impacts are not considered to pose a risk for three reasons: (1) Groundwater is not used as a drinking water source on-site or within 500 feet of the Subject Property; (2) Groundwater has not been encountered in the overburden fill and is either found more than 10 feet below impacted fill or within bedrock; and, (3) COCs present in historic fill have not been found within on-site

groundwater at concentrations exceeding applicable criteria. Given the relatively insoluble nature of PCBs in water, and their propensity to adhere to soil particles, it is unlikely that PCBs will leach into the deep overburden groundwater or bedrock groundwater units.

5.2.5 Short-Term Effectiveness

It is estimated that it would require approximately 189 work days to complete remedial excavation activities and approximately 252 work days to complete full construction. Significant site control methods would be required during this period to be protective of the community, the school, and the site workers. Because of the length of time needed to fully implement this remedial alternative it is considered to be the least effective in the short-term.

5.2.6 Implementability

The implementation of an excavation and removal remediation strategy is generally straightforward; however, the logistics of coordinating the associated tasks (truck idling and traffic, dust generation, etc.) can be difficult and (more importantly) disruptive to the community. Compared to the other alternatives, this alternative is the most difficult to implement considering:

- The estimated trucking production rate for excavation is high and may be difficult to meet and it is dependent upon good weather conditions and securing enough trucks to haul wastes and backfill.
- It would take approximately 189 work days to complete remedial excavation and approximately 252 work days to complete construction, and it would require that school recreational and athletic activities be relocated to an off-site location during the remediation period.
- Additional truck traffic during construction and the potential for sediment transport from improperly stockpiled soils during construction or fugitive dust emissions would potentially require significant mitigation measures.
- Dewatering of accumulated stormwater within open excavations, and treatment of dewatering effluent prior to discharge or disposal, could potentially be required.
- This remedial alternative would involve extensive disruption of the site and surrounding community.

5.2.7 Cost-Effectiveness

The estimated remediation and restoration cost for this alternative is $28,300,000. Additional costs related to replacing the school facilities that are out of commission during the period of work, the construction of above grade items such as bleachers, dug-outs, and fencing, and costs

associated with construction of below-grade utilities were not considered in the cost estimate. Although this alternative proposes deep remedial excavations (four feet bgs) and large disposal volumes, investigative data for the Subject Property show COCs are primarily located in shallow soils (above two feet bgs), suggesting remedial excavation costs become less efficient at or around two feet bgs. This is the most costly alternative and is considered to be the least cost effective.

5.2.8 State and Federal Acceptance

Regulatory compliance for this remedial alternative is dependent on the acceptance of a risk-based approach. Although Federal USEPA regulations under TSCA allow for risk-based remedial action in CFR §761.61(c), CTDEEP regulations require Commissioner approval and/or variances to leave impacted soil in place under an EC.

Removal of all known PCB impacted materials greater than 10 mg/kg is an acceptable approach under USEPA regulations for risk-based cleanup. The CTDEEP regulations govern PCB concentrations greater than 1 mg/kg be removed; however, they do provide some self-implementing options for the remediation of PCBs through Commissioner approval. That said, this remedial alternative may be considered acceptable to CTDEEP and the USEPA as long as:

- The USEPA approves a risk-based approach allowing low levels of PCBs (greater than 1 and less than 10 mg/kg) to remain in place below the ECs.
- Variances are obtained from the CTDEEP Commissioner allowing low levels of PCBs (greater than 1 and less than 10 mg/kg) to remain in place below the ECs.
- An EC Variance Request Application is approved and ECs are placed over remaining impacted soil.
- The PMC Conditional Exemption is approved and regulatory compliance with the PMC is achieved.
- A long-term O&M plan is designed and attached to the property via an EUR.
- Corrective measures are performed, if necessary.
- Permits necessary to perform the work are obtained.
- Comments received from the public are considered in the design and implementation of this remedial alternative.

5.2.9 Community Acceptance

This alternative would pose the greatest impact on the community as it would involve large numbers of heavy trucks on local roads daily for approximately 189 work days. In addition, the

school's athletic fields could not be used during the duration of the project. The loss of athletic fields and the significant disruption to regular school functions would be considered unacceptable to the community. Community acceptance of leaving impacted materials in place would have to be considered before the remedial alternative could be implemented.

5.3 Remedial Alternative 2

This risk-based remedial alternative consists of the excavation and off-site disposal of historic fill underlying AOC-1 to a depth of two feet, excavation and off-site disposal of soils where PCB concentrations in samples exceeded 10 mg/kg regardless of depth, and the construction of ECs over remaining impacted soils. Remedial excavation locations and depths for this remedial alternative are presented on Figure 5. Implementation of this remedial alternative would involve:

- Excavation and off-site disposal of historic fill underlying AOC-1 to a depth of two feet or to the underlying blasted rock, bedrock, or native soil layer should it be encountered first.
- Excavation and off-site disposal of all soil/fill containing PCBs greater than the I/C DEC of 10 mg/kg, regardless of depth.
- The collection of confirmatory endpoint samples to confirm the remedial objectives have been achieved and to allow the documentation of remaining concentrations in the remedial action report and decision document for the EUR to further inform future site management decisions.
- Construction of ECs to render remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg inaccessible in accordance with 22a-133k-2(f)(2)(C) of the CTDEEP RSRs.
- Placement of clean fill over remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg to raise grades back to existing conditions. The placement of clean fill and the construction of ECs will total a minimum of two feet of clean material above remaining impacted soil.
- Placement of an EUR on the Subject Property that would prohibit actions that would disturb the ECs or expose remaining impacted soil in accordance with 22a-133k-2(f)(2)(c)(iii) of the CTDEEP RSRs.
- Application of the PMC Conditional Exemption to achieve regulatory compliance for remaining impacted soil with exceedances of the GB PMC in accordance with 22a-133k-2(c)5(C) of the CTDEEP RSRs.

Under this remedial alternative, excavation and off-site disposal volumes are estimated to be:

- Approximately 31,200 cubic yards (52,900 tons) of historic fill and soil with PCBs less than 10 mg/kg;

- Approximately 1,750 cubic yards (2,950 tons) of historic fill and soil with PCBs greater than 10 mg/kg but less than 50 mg/kg; and,
- Approximately 1,225 cubic yards (2,075 tons) of historic fill and soil with PCBs greater than 50 mg/kg.

The total remedial excavation area is approximately 438,153 square feet with excavations extending between two and nine feet bgs. Some excavations would require excavation controls (e.g., sloping and/or shoring) to maintain the safety of the excavation sidewalls and would extend to depths as practical; while avoiding risks associated with potentially compromising adjacent structures. Under Remedial Alternative 2, the lead and chlordane remediation areas would be removed as a consequence the 2-foot deep remedial excavation across AOC-1.

Verification samples would be collected to determine that impacted soil is removed to the extent required to comply with applicable regulations and project approvals. Following excavation, the restoration of AOC-1 would involve the import of clean backfill to fill the excavations to the previous grades. It is estimated that an equivalent amount of backfill would be required to backfill the excavations.

The remedial excavation and backfill activities are estimated to take 108 work days. It is estimated that an average of 30 trucks hauling waste and 30 trucks hauling clean backfill would be required each work day to meet the estimated schedule. With a ten-hour work day, this is an average of 6 trucks per hour entering and leaving the site. The total estimated time to complete all remedial and construction activities is 144 days. The estimated cost for this alternative is $19,200,000.

5.3.1 Protection of Human Health and the Environment

This alternative is protective of human health and the environment by preventing exposure to remaining impacted materials. Potential exposure to remaining impacted materials would be mitigated by:

- Direct exposure to historic fill material with elevated concentrations of COCs would be prevented by the installation of a visible demarcation layer and construction of ECs above remaining impacted soil. In addition to ECs, clean fill would be placed at remedial excavation areas to raise grades back to existing conditions, totaling a minimum of two feet of clean fill and ECs above remaining impacted materials.
- The removal of all soils with PCBs greater than 10 mg/kg would eliminate the highest concentrations of PCBs from the property; therefore providing further protection to human health and the environment.
- The placement of an EUR that would restrict intrusive activities and require protective measures be implemented if impacted soil were to be contacted.

- Regular inspection and maintenance of the ECs constructed over remaining impacted materials in order to maintain the integrity of the barriers.

5.3.2 Compliance with Applicable Regulations

Regulatory compliance for this remedial alternative is dependent on the acceptance of a risk-based approach. Federal EPA regulations under TSCA allow for risk-based remedial action in CFR §761.61(c). CTDEEP regulations do not have multiple provisions for PCBs above 1 mg/kg remaining in place at a school and would require Commissioner approval and/or variances to leave impacted soil in place under an EC in accordance with Section 22a-133k-2(f)(2)(C) of the CTDEEP RSRs. Additionally, this alternative would require the implementation of an EUR that would restrict intrusive activities, and an O&M plan that would govern the inspection and maintenance of the ECs to ensure they remain protective.

With the installation of an EC and the placement of an EUR, this alternative complies with 40 CFR §761.61(a) under the following conditions:

- Inspection, maintenance and monitoring are performed and indicate no change in site conditions or migration of impacts left in place.
- Additional corrective measures are taken if inspection or monitoring indicates that they are necessary.
- Monitoring of groundwater indicates continued compliance with the applicable standards.

5.3.3 Long-Term Effectiveness and Permanence

This alternative is effective in the long-term and permanent as long as the ECs, long-term O&M plan, and EUR are maintained on the Subject Property.

5.3.4 Reduction of Toxicity, Mobility, or Volume

This alternative is effective in reducing the toxicity, mobility, and volume of chemical impacts at the Subject Property due to the extensive removal of soil impacts proposed under this excavation strategy. This alternative would remove impacted soil down to depths of at least two feet bgs as well as the highly impacted soils with PCBs above 10 mg/kg below two feet, providing a significant reduction in exposure risk for site uses. Although chemical impacts within the fill material are not expected to be migrating off-site through groundwater migration or discharge to surface water; the quantity of impacted soil to be removed under this alternative greatly reduces the potential loading of chemical impacts on the environment. Potential groundwater impacts are not considered to pose a risk for three reasons: (1) Groundwater is not used as a drinking water source on-site or within 500 feet of the Subject Property; (2) Groundwater has not been encountered in the overburden fill and is either found more than 10 feet below impacted fill or

within bedrock; and, (3) COCs present in historic fill have not been found within on-site groundwater at concentrations exceeding applicable criteria. Given the relatively insoluble nature of PCBs in water, and their propensity to adhere to soil particles, it is unlikely that PCBs will leach into the deep overburden groundwater or bedrock groundwater units.

5.3.5 Short-Term Effectiveness

This alternative has better effectiveness in the short term than Remedial Alternative 1 but it is still anticipated to take approximately 108 work days to complete remedial excavation activities and approximately 144 work days to complete full reconstruction. Significant site control methods would be required during this period to be protective of the community and site workers. This remedial alternative has moderate short-term effectiveness.

5.3.6 Implementability

The implementation of an excavation and removal remediation strategy is generally straightforward; however, the logistics of coordinating the associated tasks (truck idling and traffic, dust generation, etc.) can be difficult and (more importantly) disruptive to the community. Compared to the other alternatives, this alternative is moderately difficult to implement considering:

- The estimated trucking production rate for excavation is high and may be difficult to meet and it is dependent upon good weather conditions and securing enough trucks to haul wastes and backfill.
- It would take approximately 108 work days to complete remedial excavation and approximately 144 work days to complete construction, and it would require that school recreational and athletic activities be relocated to an off-site location during the remediation period.
- Additional truck traffic during construction and the potential for sediment transport from improperly stockpiled soils during construction or fugitive dust emissions would potentially require significant mitigation measures.
- Dewatering of accumulated stormwater within open excavations, and treatment of dewatering effluent prior to discharge or disposal, could potentially be required.
- This remedial alternative would involve extensive disruption of the site and surrounding community.

5.3.7 Cost-Effectiveness

The estimated remediation and restoration cost for this alternative is $19,200,000. Additional costs related to replacing the school facilities that are out of commission during the period of work, the construction of above grade items such as bleachers, dug-outs, and fencing, and costs associated with construction of below-grade utilities were not considered in the cost estimate. Although Remedial Alternative 2 is not the least expensive of the three alternatives, it is the most cost effective based on the level of protection it provides to human health and the environment per dollar spent completing the remediation.

5.3.8 State and Federal Acceptance

Regulatory compliance for this remedial alternative is dependent on the acceptance of a risk-based approach. Although Federal USEPA regulations under TSCA allow for risk-based remedial action in CFR §761.61(c), CTDEEP regulations require Commissioner approval and/or variances to leave impacted soil in place under an EC.

Removal of all known PCB impacted materials greater than 10 mg/kg is an acceptable approach under USEPA regulations for risk-based cleanup. The CTDEEP regulations govern PCB concentrations greater than 1 mg/kg be removed; however, they do provide some self-implementing options for the remediation of PCBs through Commissioner approval. That said, this remedial alternative may be considered acceptable to CTDEEP and the USEPA as long as:

- The USEPA approves a risk-based approach allowing low levels of PCBs (greater than 1 and less than 10 mg/kg) to remain in place below the ECs.
- Variances are obtained from the CTDEEP Commissioner allowing low levels of PCBs (greater than 1 and less than 10 mg/kg) to remain in place below the ECs.
- An EC Variance Request Application is approved and ECs are placed over remaining impacted soil.
- The PMC Conditional Exemption is approved and regulatory compliance with the PMC is achieved.
- A long-term O&M plan is designed and attached to the property via an EUR.
- Corrective measures are performed, if necessary.
- Permits necessary to perform the work are obtained.
- Comments received from the public are considered in the design and implementation of this remedial alternative.

5.3.9 Community Acceptance

This alternative would have significant impacts on the community as it would involve large numbers of heavy trucks on local roads daily for approximately 108 work days. In addition, the school's athletic fields could not be used during the duration of the project. The loss of athletic fields and the significant disruption to regular school functions would be considered unacceptable to the community. Remedial Alternatives 2 and 3 would both take more than 100 work days to complete; however, Remedial Alternative 2 would provide significantly more protection to human health and the environment than Remedial Alternative 3. Community acceptance of leaving impacted materials in place would have to be considered before the remedial alternative could be implemented.

The community would likely find Remedial Alternative 2 to be the most acceptable of the three alternatives due to its efficiency, as it would provide more protection to human health and the environment per dollar and work day spent completing the remediation than Remedial Alternatives 1 and 3.

5.4 Remedial Alternative 3

This risk-based remedial alternative consists of the excavation and off-site disposal of historic fill underlying AOC-1 to a depth of one foot, excavation and off-site disposal of soils where PCB concentrations in samples exceeded 10 mg/kg, and the construction of ECs over remaining impacted soils. Remedial excavation locations and depths for this remedial alternative are presented on Figure 6. Implementation of this remedial alternative would involve:

- Excavation and off-site disposal of historic fill underlying AOC-1 to a depth of one foot.
- Excavation and off-site disposal of all soil/fill containing PCBs greater than the I/C DEC of 10 mg/kg, regardless of depth.
- The collection of confirmatory endpoint samples to confirm the remedial objectives have been achieved and to allow the documentation of remaining concentrations in the remedial action report and decision document for the EUR to further inform future site management decisions.
- Construction of ECs to render remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg inaccessible in accordance with 22a-133k-2(f)(2)(C) of the CTDEEP RSRs.
- Placement of clean fill over remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg to raise grades back to existing conditions. The placement of clean fill and the construction of ECs will total approximately one foot of clean material above remaining impacted soil.

- Placement of an EUR on the Subject Property that would prohibit actions that would disturb the ECs or expose remaining impacted soil in accordance with 22a-133k-2(f)(2)(c)(iii) of the CTDEEP RSRs.
- Application of the PMC Conditional Exemption to achieve regulatory compliance for remaining impacted soil with exceedances of the GB PMC in accordance with 22a-133k-2(c)5(C) of the CTDEEP RSRs.

Under this remedial alternative, excavation and off-site disposal volumes are estimated to be:

- Approximately 15,600 cubic yards (26,500 tons) of historic fill and soil with PCBs less than 10 mg/kg;
- Approximately 1,750 cubic yards (2,950 tons) of historic fill and soil with PCBs greater than 10 mg/kg but less than 50 mg/kg; and,
- Approximately 1,225 cubic yards (2,075 tons) of historic fill and soil with PCBs greater than 50 mg/kg.

The total remedial excavation area is approximately 438,153 square feet with excavations extending between one and nine feet bgs. Some excavations would require excavation controls (e.g., sloping and/or shoring) to maintain the safety of the excavation sidewalls and would extend to depths as practical; while avoiding risks associated with potentially compromising adjacent structures. Under Remedial Alternative 3, the lead and chlordane remediation areas would be removed as a consequence of the one foot deep remedial excavation across AOC-1.

Verification samples would be collected to determine that impacted soil is removed to the extent required to comply with applicable regulations and project approvals. Following excavation, the restoration of AOC-1 would involve the import of clean backfill to fill the excavations to the previous grades. It is estimated that an equivalent amount of backfill would be required to backfill the excavations.

The remedial excavation and backfill activities are estimated to take 68 work days. It is estimated that an average of 30 trucks hauling waste and 30 trucks hauling clean backfill would be required each work day to meet the estimated schedule. With a ten-hour work day, this is an average of 6 trucks per hour entering and leaving the site. The total estimated time to complete all remedial and construction activities is 90 days. The estimated cost for this alternative is $14,600,000.

5.4.1 Protection of Human Health and the Environment

This alternative is considered to be protective of human health and the environment via mitigating potential exposure to remaining impacted materials. Potential exposure to remaining impacted materials would be mitigated by:

- Direct exposure to historic fill material with elevated concentrations of COCs would be mitigated by the installation of a visible demarcation layer and construction of ECs above remaining impacted soil. In addition to ECs, clean fill would be placed at remedial excavation areas to raise grades back to existing conditions, totaling approximately one foot of clean fill and ECs above remaining impacted materials.
- The removal of all soils with PCBs greater than 10 mg/kg would eliminate the highest concentrations of PCBs from the property; therefore providing further protection to human health and the environment.
- The placement of an EUR that would restrict intrusive activities and require protective measures be implemented if impacted soil were to be contacted.
- Regular inspection and maintenance of the ECs constructed over remaining impacted materials in order to maintain the integrity of the barriers.

5.4.2 Compliance with Applicable Regulations

Regulatory compliance for this remedial alternative is dependent on the acceptance of a risk-based approach. Federal EPA regulations under TSCA allow for risk-based remedial action in CFR §761.61(c). CTDEEP regulations do not have multiple provisions for PCBs above 1 mg/kg remaining in place at a school and would require Commissioner approval and/or variances to leave impacted soil in place under an EC in accordance with Section 22a-133k-2(f)(2)(C) of the CTDEEP RSRs. Additionally, this alternative would require the implementation of an EUR that would restrict intrusive activities, and an O&M plan that would govern the inspection and maintenance of the ECs to ensure they remain protective.

With the installation of an EC and the placement of an EUR, this alternative complies with 40 CFR §761.61(a) under the following conditions:

- Inspection, maintenance and monitoring are performed and indicate no change in site conditions or migration of impacts left in place.
- Additional corrective measures are taken if inspection or monitoring indicates that they are necessary.
- Monitoring of groundwater indicates continued compliance with the applicable standards.

5.4.3 Long-Term Effectiveness and Permanence

This alternative is effective in the long-term and permanent as long as the ECs, long-term O&M plan, and EUR are maintained on the Subject Property.

5.4.4 Reduction of Toxicity, Mobility, or Volume

This alternative is effective in reducing the toxicity, mobility, and volume of chemical impacts at the Subject Property due to the extensive removal of soil impacts proposed under this excavation strategy. This alternative would remove impacted soil down to depths of at least one foot bgs as well as remove highly impacted soils with PCBs above 10 mg/kg below one foot, providing a reduction in exposure risk for site uses. Although chemical impacts within the fill material are not expected to be migrating off-site through groundwater migration or discharge to surface water; the quantity of impacted soil to be removed under this alternative reduces the potential loading of chemical impacts on the environment. Potential groundwater impacts are not considered to pose a risk for three reasons: (1) Groundwater is not used as a drinking water source on-site or within 500 feet of the Subject Property; (2) Groundwater has not been encountered in the overburden fill and is either found more than 10 feet below impacted fill or within bedrock; and, (3) COCs present in historic fill have not been found within on-site groundwater at concentrations exceeding applicable criteria. Given the relatively insoluble nature of PCBs in water, and their propensity to adhere to soil particles, it is unlikely that PCBs will leach into the deep overburden groundwater or bedrock groundwater units.

5.4.5 Short-Term Effectiveness

This alternative is considered to be the most effective in the short-term; however, it is still anticipated to take approximately 68 work days to complete remedial excavation activities and approximately 90 work days to complete full construction. Significant site control methods would be required during this period to be protective of the community and site workers. This remedial alternative has moderate short-term effectiveness.

5.4.6 Implementability

The implementation of an excavation and removal remediation strategy is generally straightforward; however, the logistics of coordinating the associated tasks (truck idling and traffic, dust generation, etc.) can be difficult and (more importantly) disruptive to the community. Compared to the other alternatives, this alternative is moderately difficult to implement considering:

- The estimated trucking production rate for excavation is high and may be difficult to meet and it is dependent upon good weather conditions and securing enough trucks to haul wastes and backfill.
- It would take approximately 68 work days to complete remedial excavation and approximately 90 work days to complete construction, and it would require that school

recreational and athletic activities be relocated to an off-site location during the remediation period.

- Additional truck traffic during construction and the potential for sediment transport from improperly stockpiled soils during construction or fugitive dust emissions would potentially require significant mitigation measures.
- Dewatering of accumulated stormwater within open excavations, and treatment of dewatering effluent prior to discharge or disposal, could potentially be required.
- This remedial alternative would involve extensive disruption of the site and surrounding community.

5.4.7 Cost-Effectiveness

Remedial Alternative 3 is the least expensive of the three alternatives proposed but still maintains significant costs associated with its implementation. The estimated remediation and restoration cost for this alternative is $14,600,000. Additional costs related to replacing the school facilities that are out of commission during the period of work, the construction of above grade items such as bleachers, dug-outs, and fencing, and costs associated with construction of below-grade utilities were not considered in the cost estimate. Although Remedial Alternative 3 is the least expensive of the three alternatives, it is not the most cost effective approach when compared to Remedial Alternative 2 based on the protection it provides to human health and the environment per dollar spent completing the remediation.

5.4.8 State and Federal Acceptance

Regulatory compliance for this remedial alternative is dependent on the acceptance of a risk-based approach. Although Federal USEPA regulations under TSCA allow for risk-based remedial action in CFR §761.61(c), CTDEEP regulations require Commissioner approval and/or variances to leave impacted soil in place under an EC.

Removal of all known PCB impacted materials greater than 10 mg/kg is an acceptable approach under USEPA regulations for risk-based cleanup. The CTDEEP regulations govern PCB concentrations greater than 1 mg/kg be removed; however, they do provide some self-implementing options for the remediation of PCBs through Commissioner approval. That said, this remedial alternative may be considered acceptable to CTDEEP and the USEPA as long as:

- The USEPA approves a risk-based approach allowing low levels of PCBs (greater than 1 and less than 10 mg/kg) to remain in place below the ECs.
- Variances are obtained from the CTDEEP Commissioner allowing low levels of PCBs (greater than 1 and less than 10 mg/kg) to remain in place below the ECs.

- An EC Variance Request Application is approved and ECs are placed over remaining impacted soil.
- The PMC Conditional Exemption is approved and regulatory compliance with the PMC is achieved.
- A long-term O&M plan is designed and attached to the property via an EUR.
- Corrective measures are performed, if necessary.
- Permits necessary to perform the work are obtained.
- Comments received from the public are considered in the design and implementation of this remedial alternative.

5.4.9 Community Acceptance

This alternative would have significant impacts on the community as it would involve large numbers of heavy trucks on local roads daily for approximately 68 work days. In addition, the school's athletic fields could not be used during the duration of the project. The loss of athletic fields and the significant disruption to regular school functions would be considered unacceptable to the community. Community acceptance of leaving impacted materials in place would have to be considered before the remedial alternative could be implemented.

This remedial alternative would allow for the earliest replacement of the athletic fields and causes the least amount of disruption to school and athletic activities; however, it does not provide the level of protection to human health or the environment that Remedial Alternatives 1 and 2 provide. Although this alternative may be completed faster, the community would likely not accept the risks involved with the limited protection to human health and the environment this alternative provides.

6.0 AOC-1 RECOMMENDED REMEDIAL APPROACH

The recommended remedial approach for AOC-1 is Remedial Alternative 2 due to its balanced approach with respect to reducing contaminant concentrations, preventing direct exposure, and cost to implement. This remedial approach for AOC-1 will also include the remediation of AOC-2 in accordance with the remedial approach provided in Section 7.2 of this RAP. This alternative involves the following activities:

- Excavation and off-site disposal of historic fill underlying AOC-1 to a depth of two feet or to the underlying blasted rock, bedrock, or native soil layer should it be encountered first.
- Excavation and off-site disposal of all soil/fill containing PCBs greater than the I/C DEC of 10 mg/kg, regardless of depth.
- The collection of confirmatory endpoint samples to confirm the remedial objectives have been achieved and to allow the documentation of remaining concentrations in the remedial action report and decision document for the EUR to further inform future site management decisions.
- Construction of ECs to render remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg inaccessible in accordance with 22a-133k-2(f)(2)(C) of the CTDEEP RSRs.
- Placement of clean fill over remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg to raise grades back to existing conditions. The construction of the ECs will include placement of a minimum of two feet of clean material above remaining impacted soil with high-visibility demarcation layers both above and below the minimum two-foot-thick ECs.
- Placement of an EUR on the Subject Property that would prohibit actions that would disturb the ECs or expose remaining impacted soil in accordance with 22a-133k-2(f)(2)(C)(iii) of the CTDEEP RSRs.
- Application of the PMC Conditional Exemption to achieve regulatory compliance for remaining impacted soil with exceedances of the GB PMC in accordance with 22a-133k-2(c)5(C) of the CTDEEP RSRs.

This remedial alternative was selected based upon the following evaluation:

- This alternative is protective of human health and the environment because the top two feet of historic fill, where the majority of PCB mass and elevated concentrations of COCs is located, will be removed and replaced with a minimum of two feet of clean fill. Further, impacted soil with PCBs greater than 10 mg/kg would be removed regardless of depth. Following excavation AOC-1 would be capped with ECs (See section 7.1 of this document

for more details on the proposed ECs). This action would significantly reduce the contaminant load on the site for current and potential future site uses and remaining impacted soil would be rendered inaccessible below ECs.

- This alternative complies with federal regulations for PCBs under §761.61(c) which provides for risk-based disposal, because it eliminates the potential for exposure to PCBs in addition to other on-site COCs. This alternative will also comply with Connecticut state regulations which allow for Commissioner approval of ECs to reach regulatory compliance with the DEC and use of the PMC Conditional Exemption to reach regulatory compliance with the PMC.
- This alternative is effective in the long-term and permanent as long as an EUR is maintained and an EC inspection and maintenance program is implemented.
- Significant reduction in toxicity, mobility, and volume will be achieved by this alternative. Approximately 34,074 cubic yards (57,926 tons) of PCB-impacted soil will be removed from the Subject Property. Directly accessible impacted soil and highly impacted soil will be removed, which will provide sufficient reduction in toxicity and risk posed from these impacts.
- This alternative is moderately effective in the short-term. Remedial excavation activities are estimated to be completed within 108 work days and full construction is estimated to be completed within 144 work days.
- This alternative is considered to be implementable because it involves moderate site disruption and restoration.
- This alternative is considered to be cost effective. The estimated cost for Remedial Alternative 2 is $19,200,000, approximately $19,500,000 less than remediating to unrestricted compliance with the RDEC and GB PMC, and approximately $9,100,000 less than Remedial Alternative 1.
- This alternative is acceptable to regulators as long as long-term monitoring, inspections, and repairs are performed and reported to regulators on a routine basis.
- A public communication program will be implemented to explain this remedial alternative and other alternatives in order to engage community input and develop community acceptance.

Due to the nature of the contamination and its source (historic fill), excavation, off-site disposal, and capping of the material was determined to be the most effective approach. Three excavation and capping remedial alternatives were evaluated for their protection of human health and the environment, their compliance with regulations, long and short term effectiveness, reduction of

toxicity, ability to implement, and cost effectiveness. A summary of the evaluation is provided above as well as in Table 10.

Based on the evaluation of remedial alternatives, the proposed remedial approach summarized above was determined to be the most cost effective based on the level of protection it provides to human health and the environment per dollar spent. Based on the findings of Langan's 2016 HHRA, soil impacts that will remain following implementation of the remedial excavations and construction of the proposed ECs do not pose a significant risk to human health or the environment. Furthermore, failure of the proposed EC would not present a significant short-term risk to human health or the environment if it were to occur. Extensive damage to the EC would be required for a significant exposure risk to be present. With the placement of an EUR and the implementation of a maintenance and monitoring plan, the potential for a failure to the EC will be actively mitigated. This remedial approach meets the conditions necessary for the CTDEEP Commissioner to approve the construction of the ECs in accordance with Section 22a-133k-2(f)(2)(A) of the RSRs as presented below:

- Cost of Remediation vs. Cost of Engineered Control – As summarized in Table 10, the cost of remediating to numerical criteria in accordance with Section 22a-133k-2(b)(1) of the RSRs would be approximately $19,500,000 greater than the cost of the proposed remedial approach. Additionally, the cost of implementing the remedial actions summarized in Remedial Alternative 1 in accordance with Section 22a-133k-1(a)(39) of the RSRs would be approximately $9,100,000 greater than the cost of the proposed remedial approach.
- Cost of Engineered Control vs. Potential Risk – The cost of remediating to self-implementing procedures in accordance with Section 22a-133k-2(f)(2)(C) of the RSRs greatly outweighs the risk posed to human health and the environment should an engineered control fail to prevent exposure to the remaining impacted soils. The concentrations of contaminants proposed to remain below the ECs do not pose a short term risk. For a significant exposure to occur a disturbance to the ECs over a large area and for an extended period of time would be required. Any disturbance to the ECs will be prohibited by the placement of an EUR on the Subject Property and potential failures of the ECs will be mitigated by implementation of a monitoring and maintenance plan. Physical isolation of the remaining impacted soils below the ECs poses negligible risk to human health and the environment.

Based on the long and consistent history of the Subject Property, and the findings of Langan's previous environmental soil and groundwater investigations, remaining exceedances of the GB PMC in soil can be addressed by applying for the PMC Conditional Exemption. The Subject Property meets the conditions necessary for the CTDEEP Commissioner to approve the use of

the PMC Conditional Exemption in accordance with Section 22a-133k-2(c)5(C) of the RSRs as presented below:

- Impacted Soil Subject to Infiltration – As outlined in previous sections of this report, the source of contamination at the Subject Property is impacted historic fill underlying the athletic fields at AOC-1. This fill material was imported to the Subject Property in the early-1960s to raise grades during construction of the athletic fields. Since the early-1960s the athletic fields have remained the same, a natural grass covered area subject to, and unobstructed from, infiltration. As the athletic fields have been subject to and not obstructed from infiltration for more than 60 years, the Subject Property meets the requirements of Sections 22a-133k-2(c)5(C)(i) and 22a-133k-2(c)5(C)(ii) of the RSRs.
- Groundwater Monitoring Analytical Data - As outlined in previous sections of this report, groundwater monitoring analytical data at both up-gradient and down-gradient portions of the Subject Property have not identified COCs at concentrations greater than or equal to the SWPC. The groundwater analytical data indicates the contaminants present in the historic fill material are not leaching into groundwater at concentrations that would warrant action. As such, the groundwater monitoring completed at the Subject Property meets the requirements of Sections 22a-133k-2(c)5(C)(iii) and 22a-133k-2(c)5(C)(iv) of the RSRs.

7.0 RAP TECHNICAL APPROACH

Planned remediation for the Subject Property is summarized below. A Remedial Excavation Plan & Remaining Soil Exceedances map is provided as Figure 7.

7.1 AOC-1 (Athletic Fields)

The recommended technical approach for remediation of impacted soil at AOC-1 is Remedial Alternative 2 (Sections 5.3 and 6.0). This approach includes the excavation and off-site disposal of historic fill across AOC-1 to depths of two feet bgs, the excavation and off-site disposal of soil containing PCBs greater than 10 mg/kg regardless of depth, the placement of a minimum of two feet of clean fill over remaining impacted soil to raise grades back to existing conditions, the construction of ECs to render remaining impacted soil inaccessible and physically isolated from human contact, the installation of high-visibility demarcation layers both above and below the ECs, and the placement of an EUR to prohibit actions that would disturb the ECs or expose the remaining impacted soil underlying the ECs. Remedial excavation of AOC-1 will generate approximately 34,074 cubic yards (57,925 tons) of impacted soil to be disposed of off-site. The remedial excavation locations for AOC-1 are provided on Figures 5 and 7. The locations and lateral extents of the proposed ECs are shown on Figure 8. Details showing the vertical composition of ECs are provided on Figure 9.

Draft design drawings detailing the design of the proposed athletic field's construction including the design of the artificial turf fields, asphalt/concrete pavement areas, and natural grass landscaped areas are provided in Appendix F.

The following three EC types are included in the remedial design:

1. Artificial Turf EC - A minimum 24-inch thick EC consisting of (from bottom to top) a high-visibility demarcation layer above the remaining impacted soil, a minimum of 12 inches of clean fill to achieve grading requirements, a layer of non-woven geotextile filter fabric, a flat drain, a minimum of 12 inches of clean crushed stone, and finished with a high-visibility demarcation layer to render remaining impacted soil inaccessible and physically isolated. Above the EC's high-visibility demarcation layer will be a layer of clean crushed finishing stone followed by artificial turf field components to the finished grade. The layer of clean crushed finishing stone and the artificial turf materials would be above the EC to allow for general maintenance to occur.
2. Asphalt and Concrete EC – A minimum 24-inch thick EC consisting of (from bottom to top) a high-visibility demarcation layer above remaining impacted soil, a minimum of 24 inches of clean fill to achieve grading requirements, and finished with a high-visibility demarcation layer to render remaining impacted soil inaccessible and physically isolated. Above the EC's high-visibility demarcation layer will be an approximately 6 inch layer of

crushed stone followed by 2 to 7 inches of asphalt and/or concrete to the finished grade. The layer of crushed stone and the asphalt and/or concrete would be above the EC to allow for general maintenance to occur.

3. Clean Soil Cap EC - An minimum 24-inch thick EC consisting of (from bottom to top) a high-visibility demarcation layer above remaining impacted soil, a minimum of 24 inches of clean fill to achieve grading requirements, and finished with a high-visibility demarcation layer to render remaining impacted soil inaccessible and physically isolated. Above the EC's high-visibility demarcation layer will be an approximately 6 inch layer of topsoil followed by natural grass to the finished grade. The layer of topsoil and natural grass would be above the EC to allow for general maintenance to occur.

An EC Variance Request Part I application was submitted to the CTDEEP on 21 January 2022. Comments from the CTDEEP with requested changes to the proposed ECs summarized in the EC Variance Request Part I application were received on 6 May 2022; the comments and requested changes to the ECs by CTDEEP have been addressed and are included throughout this RAP. A revised EC Variance Request Part I application is being submitted in conjunction with this RAP as Appendix B.

An EUR will be recorded for the Subject Property that will prohibit actions that would expose the remaining impacted soil underlying the ECs. The ECs are designed as to allow the maintenance of overlying materials (i.e. artificial turf components, stormwater infrastructure, and asphalt/concrete pavement) without disturbing the ECs and the underlying impacted soils. The proposed ECs will render the remaining impacted soil with exceedances of the RDEC inaccessible and physically isolated from human contact in accordance with Section 22a-133k-2(f)(2)(C)(vii) of the RSRs.

The COCs at concentrations exceeding the RDEC and GB PMC that remain following remediation are shown on Figures 7 and 8. Remaining impacted soil with exceedances of the GB PMC will achieve regulatory compliance by applying for the PMC Conditional Exemption in accordance with Section 22a-133k-2(c)5(C) of the CTDEEP RSRs. Remaining impacted soil with exceedances of the RDEC will achieve regulatory compliance by rendering the soil inaccessible and physically isolated through use of ECs in accordance with Section 22a-133k-2(f)(2) of the CTDEEP RSRs. Inaccessible soil will be maintained indefinitely via an EUR to be recorded at the Subject Property. A post-remediation monitoring and maintenance plan will be implemented as a part of the EUR that will ensure remedial components are maintained and functioning per design indefinitely.

7.2 AOC-2 (Recreational Area)

The technical approach for soil impacted with arsenic and pesticides at AOC-2 is targeted excavation and off-site disposal. Approximately 30-CY of soil will be excavated to remove arsenic impacted soil to approximately three feet bgs at locations SB-2, SS-1 and SS-5. Approximately

10-CY of soil will be excavated to remove arsenic and pesticide impacted soil to approximately three feet bgs at location SB-3. Excavated soil will be disposed of at an approved facility. Post-excavation verification samples will be collected from the bottoms and sidewalls of the remedial excavations at a frequency of one bottom sample per 400 square feet and one sidewall sample per 20 linear feet. Verification samples will determine whether arsenic and pesticide impacted soil is removed to the extent required. Following excavation, the restoration of AOC-2 would involve the import of clean fill and topsoil to fill the excavation to the previous grade. It is estimated that an equivalent amount of clean fill and topsoil would be required to backfill the excavation and that the surface of the excavation would be restored to current conditions, a natural grass cover. Remedial excavation locations for AOC-2 are presented on Figure 7.

8.0 REMEDIAL ACTIVITIES AND COMPONENTS

Based on the remedial approaches presented in Section 7, the following remedial activities and components have been developed.

8.1 Pre-Remedial Activities

The following components are required prior to commencement of remedial activities.

8.1.1 Health & Safety Plan

All remediation activities will be conducted in accordance with a site-specific Health and Safety Plan (HASP). The remediation contractor, general contractor, and all relevant subcontractors handling impacted materials and/or working within remedial areas will be required to prepare and follow their own site-specific HASP for their specific remedial activities. An overall site-specific HASP completed by the remediation contractor and/or general contractor will be on-site during all remedial activities involving the handling and management of impacted soil and will address the safety and health hazards of each phase of site operation and the procedures for employee protection. All subcontractors and visitors to the site would be covered by, and would be required to acknowledge understanding of, and willingness/ability to comply with the requirements of the remediation contractor's and/or general contractor's overall site-specific HASP.

Site-specific HASPs must meet the requirements of 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER) and be specific to the types of remediation work being planned for the Subject Property. The objective of a site-specific HASP is to protect the health and safety of on-site personnel and to limit exposure of the public to hazardous substances, pollutants, and contaminants. A site-specific HASP includes, but is not limited to, the following components:

- Brief site description
- Organizations and identification of key personnel;
- Site-specific training requirements;
- Medical surveillance requirements;
- List of site hazards and COCs;
- Excavation safety;
- Heavy equipment safety;
- Work zone descriptions and monitoring procedures;
- Personal safety equipment and protective clothing requirements;

- Decontamination requirements;
- Remedial waste handling and management;
- Standard operating procedures;
- Emergency response;
- Contingency plan; and,
- Safety data sheets (SDS).

All remedial work will be completed by personnel with the appropriate training required to conduct the work in accordance with 29 CFR 1910.120 and all other applicable trainings required for site work. Completion of an initial 40 hour HAZWOPER training program as detailed in OSHA's 29 CFR 1910.120(e) is required for all employees who will perform work in areas where the potential for exposure to hazardous substances or health hazards exists. Annual eight-hour refresher training is also required to maintain competencies to ensure a safe work environment. All personnel who will be performing field work involving potential exposure to hazardous substances will be required to have passed an initial baseline medical examination, with follow up medical exams thereafter, consistent with 29 CFR 1910.120(f).

Langan's HASP is provided in Appendix C of this RAP as a reference example. Langan's HASP will be on-site during remedial work involving the handling and management of impacted soil and will cover all Langan employees and its subcontractors.

8.1.2 Notification and Certification

In accordance with §761.61(a)(3)(E), this RAP serves as the Notification by the Greenwich Public Schools to the EPA Region 1 Coordinator and will be provided to state (CTDEEP and CTDPH) and local environmental officials (Town of Greenwich Health Department). Attached in Appendix D is a PCB Notification and Certification, signed by a representative of the Greenwich Public Schools (the owner of the property where the cleanup site is located) and by a representative of Langan (the party conducting the cleanup). The PCB Notification and Certification certifies the sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site are on file at the location designated in the certificate and are available for EPA inspection.

8.1.3 Permitting and Approvals

Based on review of Federal, State, and local regulations, a preliminary list of applicable permits and approvals required to conduct the proposed remedial activities at the Subject Property are listed in the following sub-sections.

8.1.3.1 EPA Approval

This Notification serves at the application for EPA approval of a Risk Based Corrective Action under Section 40 CFR § 761.61(c). All required information for the Notification is included within this RAP or previously submitted investigation reports. Specific approvals requested of the EPA include the following:

- Approval for in-place disposal of PCBs at concentrations greater than 1 mg/kg and less than 10 mg/kg below the minimum 24-inch thick artificial turf EC;
- Approval for in-place disposal of PCBs at concentrations greater than 1 mg/kg and less than 10 mg/kg below the minimum 24-inch thick asphalt and concrete pavement EC;
- Approval for in-place disposal of PCBs at concentrations greater than 1 mg/kg and less than 10 mg/kg below the minimum 24-inch thick clean soil cap EC;
- Approval to manage soil excavated from designated areas of AOC-1 which contain PCBs at concentrations greater than 1 mg/kg and less than 50 mg/kg at a licensed municipal solid waste facility in accordance with 40 CFR 761.61(a)(5)(i)(B)(2)(ii);
- Approval to manage soil excavated from designated areas of AOC-1 which contain PCBs at concentrations greater than 50 mg/kg at a licensed hazardous waste facility or PCB disposal facility in accordance with 40 CFR 761.61(a)(5)(i)(B)(2)(iii);
- Approval for an exemption from the permeability requirements referenced in 40 CFR 761.61(a)(7) for the artificial turf cap emplaced over remaining PCB impacted soils beneath artificial turf areas at AOC-1;
- Approval for an exemption from the permeability requirements referenced in 40 CFR 761.61(a)(7) for the clean soil cap emplaced over remaining PCB impacted soils beneath natural grass landscaped area's clean soil cap at AOC-1; and,
- Approval for alternate timing to implement the deed notice as specified in 40 CFR 761.61(a)(8) to allow for a period of one year following the completion of remediation, due to the complexity of the Connecticut EUR process.

The alternate permeability requirements are requested and considered justified based on the absence of dissolved PCBs within groundwater below the Subject Property.

8.1.3.2 CTDEEP Approval

In accordance with the VRP, CTDEEP has retained oversight of the investigation and remediation of the Subject Property. Therefore, the planned remedial actions summarized herein will require CTDEEP Commissioner approval prior to implementing this RAP.

CTDEEP EC Variance Request (Section 22a-133k-2(f)2 of CTDEEP RSRs)

An EC Variance Request Part I application was submitted to the CTDEEP on 21 January 2022. Comments from the CTDEEP with requested changes to the proposed ECs summarized in the EC Variance Request Part I application were received on 6 May 2022; the comments and requested changes to the ECs by CTDEEP have been addressed and are included throughout this RAP. A revised EC Variance Request Part I application is being submitted in conjunction with this RAP as Appendix B.

The EC Variance Request application is for the approval to use the three EC types proposed within this RAP, including the artificial turf EC, the asphalt and concrete EC, and the clean soil cap EC. Approval of these ECs is required to achieve regulatory compliance for the remaining impacted soil with exceedances of the RDEC beneath AOC-1, in accordance with Section 22a-133k-2(f)(2) of the CTDEEP RSRs.

Alternative DEC for PCBs (Section 22a-133k-2(b)(4) of CTDEEP RSRs)

The remedial approach presented in this RAP proposes impacted historic fill with concentrations of PCBs exceeding 1 mg/kg but below 10 mg/kg will remain on-site below ECs measuring at a minimum 24-inches thick and an EUR will be placed on the site that will prohibit actions that could disturb the ECs or expose remaining impacted soil indefinitely. This document requests approval of an alternative residential "inaccessible soil" DEC of 10 mg/kg for PCBs, which will be capped using ECs to render impacted historic fill inaccessible and physically isolated, in accordance with Section 22a-133k-2(b)(4) of the CTDEEP RSRs.

PMC Conditional Exemption (Section 22a-133k-2(c)5(C) of CTDEEP RSRs)

The remedial approach presented in this RAP proposes impacted historic fill with concentrations of SVOCs and pesticides exceeding the GB PMC will remain on-site below ECs measuring at a minimum 24-inches thick and an EUR will be placed on the site that will prohibit actions that could disturb the ECs or expose remaining impacted soil indefinitely. This document requests approval for use of the PMC Conditional Exemption in accordance with Section 22a-133k-2(c)5(C) of the RSRs.

CTDEEP Stormwater and Dewatering Permit (DEP-PERD-GP-015)

The CTDEEP General Permit for Stormwater and Dewatering Wastewaters from Construction Activities (DEP-PERD-GP-015) requires that disturbances between 1 and 5 acres meet the requirements of the stormwater general permit (GP). Disturbances of less than 1 acre do not require the filing of a permit. The area of activities proposed for remediation is estimated to be more than one acre, and therefore, a stormwater GP will be required. CTDEEP approval of the stormwater GP is presumptive. Work performed under the stormwater GP will be in compliance with the Guidelines for Soil Erosion and Sediment Control (DEEP, 2002)

CTDEEP Staging and Transfer Permit (DEP-SW-GP-001)

The CTDEEP general permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) (DEP-SW-GP-001) authorizes the staging, transfer, and temporary storage of contaminated soil or sediment and is intended to address the management of these materials when they are generated during projects that are less than two years in duration and involve the excavation of earthen material. The Contaminated Soil Management GP establishes a uniform set of environmentally protective management procedures for stockpiling soils. It is not anticipated that the remediation work will trigger a requirement to submit registration or request approval for this GP. Staging of impacted material will be performed in accordance with the requirements of the General Permit.

CTDEEP Discharge of Groundwater Remediation Waste Permit (DEEP-WPED-GP-027)

The CTDEEP General Permit for the Discharge of Groundwater Remediation Waste (DEEP-WPED-GP-027) authorizes a discharge comprised solely of groundwater remediation wastewater. Groundwater remediation wastewater is defined as wastewater generated in connection with investigating pollution or remediating polluted groundwater, sediment or soil. Groundwater remediation wastewater includes without limitation groundwater which collects in an excavation or foundation drain or other subsurface facility or structure; groundwater contaminated runoff and stormwater impacted by on-site pollutants from any construction activity; wash-down or backwash wastewater from treatment facilities; well development wastewater, and wastewater generated by removing an underground storage tank or by developing, testing, sampling, or purging a well, or by maintaining treatment facilities. Due to the activities associated with the proposed remedial approach, which includes large remedial excavations of polluted soils, groundwater remediation wastewater is anticipated to be generated, and therefore, a GP for the Discharge of Groundwater Remediation Waste will be required. The proposed remedial activities will be performed in accordance with the requirements of the GP.

8.1.4 Public Notice

Public notice will be made for remedial activities in accordance with the Connecticut RSRs and RCSA regulations. The public notification process will be conducted in accordance with CGS §22a-133x (i) and RSR §22a-133k-1(d). Further information regarding public notification is summarized in Section 2.3 of this RAP.

8.1.5 Site Security

Site security will be managed by the selected remediation contractor, the general contractor, and/or construction manager. Work will be performed continuously; however, remedial excavation and backfill activities will likely occur in phases to reduce the size of remedial

excavations and limit the exposure to the underlying remaining impacted soils. Remedial excavation work will likely begin during school break in the summer, which will limit the number and frequency of site visitors during a portion of remedial activities. Restoration activities including the installation and construction of the artificial turf fields will likely be performed immediately following completion of the remedial excavation and backfill phases. During performance of the work, all unauthorized personnel will be prevented from entering active remediation areas. The individual remediation areas undergoing active remediation will be demarcated with barriers such as temporary chain link fencing or orange snow fencing set back from excavation areas. The latter approach is appropriate for excavations to depths of less than four feet in areas where traffic patterns would not allow accidental vehicle entry. Where vehicular traffic entry is possible or excavations exceed four feet, chain link fencing would be used.

Prior to performing remedial excavation, the general work area will be divided into three work zones to reduce the potential spread of contaminated materials into clean areas. These three zones will be clearly delineated and will include:

- Contamination Zone (Hot Zone) – Areas believed to contain impacted materials at concentrations above the established cleanup levels. Only authorized personnel will be allowed to enter a contaminated zone.
- Decontamination Zone – A secure area will be established for decontamination of equipment and personnel and for access control in an area proximate to the Contamination Zone.
- Clean Zone – An area will be designated for clean operations. Personnel, vehicles, supplies, and supply trailers will be located in this zone. All clean activities may be carried out in this area

8.1.6 Decontamination Plan

Decontamination procedures will be performed in accordance with the procedures defined in 40 CFR 761.79. For equipment used during remediation of PCB impacted soils, decontamination of non-porous surfaces on equipment, tools, and machinery will be performed following procedures defined in 40 CFR 761.79(c)(2). Dirty, non-porous surfaces will be decontaminated following the procedures specified in 40 CFR 761.375. Decontamination of on-site heavy equipment will be performed, as necessary, to minimize the potential spreading of contaminated soil, dust and debris. After dry brushing construction vehicles and equipment at each individual remediation area to remove loose soils and minimize dust, the vehicles/equipment will be decontaminated, as appropriate. Decontamination may include high-pressure water or a steam cleaner to remove soils. Pressure washing decontamination will be conducted on a temporary pad constructed for this purpose. Containment of decontamination fluids is discussed in Section 8.1.7.1 of this RAP. For general decontamination of dump trailers, a stone construction entrance may be sufficient to

complete decontamination. All vehicles brought onto the site will be inspected and, if needed, will undergo decontamination/cleaning prior to use on-site.

8.1.7 Waste Management

Several waste streams will be generated during remedial activities at the Subject Property. Temporary stockpiling of materials on-site may be required at times until a critical volume of material is generated to improve the economics and efficiency of transportation and disposal. PCB remediation waste will be stored in accordance with 40 CFR 761.65(c)(1)(iii) or 761.65(c)(9). Storage areas and containers will be marked in accordance with 40 CFR 761.45(a).

Prior to being transported off-site, wastes will be characterized and profiled for disposal. Soil may be sampled in-situ for waste disposal parameters to speed the management of excavated soil, or composite soil samples will be collected from stockpiles for waste characterization. The disposal facility will confirm acceptance of the waste prior to transport. Regulated waste will be disposed of at a facility permitted to accept such wastes.

When wastes are moved off-site, waste removal will be documented by manifest or bill of lading. The Greenwich Public Schools will be identified as the generator of the waste, and a Greenwich Public Schools representative will sign waste profile forms and manifests. The waste disposal subcontractor will prepare disposal manifests or bills of lading and documentation. The disposal documentation will be included in the remedial action report.

8.1.7.1 Decontamination Fluids

Decontamination fluids generated from construction equipment will be temporarily containerized in DOT drums for appropriate management. Containerized fluids will be labeled with the date of generation, contents, and source of decontamination fluid. Containerized fluids will be sampled prior to off-site disposal at an appropriately licensed and permitted disposal facility.

8.1.7.2 Soil Management

For off-site soil disposal, the receiving facilities will be chosen based on waste characterization results, tipping fees, hauling fees, and the disposal facility's operating permit. Any stockpiles of contaminated soil designated for off-site disposal which are not actively being generated or removed will be covered with weatherproof tarps or poly sheeting secured with sandbags or other ballast in accordance with the CTDEEP general permit for Contaminated Soil and/or Sediment Management.

PCB remediation waste is expected to be live-loaded or staged in lined roll-off containers, pending shipment off-site. If PCB remediation waste is stockpiled, the stockpile will be

constructed in accordance with 40 CFR 761.65(c)(9) using 20 mil poly sheeting as both cover and liner, bermed to prevent run-on and contain stormwater.

During remedial excavation, material segregation will be conducted based on existing data and field observations. Additional segregation may be performed based on the results of stockpile sample analysis. After the excavated material is sufficiently and appropriately segregated, it will be managed accordingly. Trucks will be loaded to within load limits and proper shipping papers will be provided prior to transport

8.1.7.3 PPE and General Solid Waste

Other solid materials (such as plastic sheeting and hay bales) used during remediation activities will be segregated from other waste streams. If solid materials come into contact with contaminated materials, the solid materials will be disposed along with the contaminated materials. If the solid materials do not come into contact with contaminated materials, they will be disposed as municipal solid waste. Personal protective equipment (PPE) used during the work will be disposed as municipal solid waste

8.2 Remedial Activities

The following components are required following commencement of remedial activities.

8.2.1 Pre- and Post-Construction Survey

Remedial activities will include pre- and post-excavation surveys. A pre-design survey of the work area will be performed to characterize the ground surface contours and current landmark locations. The pre- and post-excavation surveys will ensure that the location of non-impacted samples that were obtained during prior investigation activities to delineate the remediation areas, are clearly marked in the field. Post-construction surveys are needed for purposes of as-built documentation and for verification that the planned excavation achieved the desired limits. Surveys may be performed using conventional survey equipment and/or hand-held global positioning system (GPS) devices. Local relative measurements may also be recorded to supplement survey data, as required. Survey results will be recorded on post-construction record drawings

8.2.2 Site Preparation

Site preparation activities will include but are not limited to the following:

- Utility identification and demarcation;

- Contractor mobilization and installation of temporary facilities including impacted soil stockpile areas, decontamination areas, clean fill stockpile areas, access roads, sanitary facilities, etc.;
- Construction of site security systems including perimeter fencing, locked entrance gates, signage, etc.;
- Construction of soil and materials staging areas;
- Installation of temporary erosion controls; and,
- Demarcation of proposed work activities and Work Zones.

8.2.2.1 Sedimentation and Erosion Controls

Prior to the performance of any clearing or earthwork activities, an erosion and sedimentation control system (i.e. straw bales or wattles, silt fence or silt sock) will be installed around the proposed limits of disturbance and will be inspected for approval. Erosion and sedimentation controls will be installed and maintained in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control and any local requirements. To prevent off-site migration of materials, all equipment will be decontaminated prior to leaving the site, and excavation work will not be performed during heavy precipitation events. See Section 8.1.6 of this RAP for decontamination procedures.

The location of the proposed soil erosion and sediment control measures and details for construction will be shown on the construction drawings. To maintain the effectiveness of the soil erosion and sediment control measures throughout remedial construction activities, these features will be inspected regularly. If sediment deposits reach one-half the height of the barrier, sediments will be removed from the barrier and managed by removal for on-site management or off-site disposal, based on the source of the accumulated sediments.

8.2.2.2 Staging Areas

Staging areas will be constructed and used for the duration of the project. Staging areas will be located strategically at the Subject Property, depending on the proximity of the remediation areas being excavated. Multiple staging areas may be prepared to allow for segregation of impacted materials and for storage of debris, clean fill, and materials used in the performance of remediation. Material staging areas containing soil or impacted materials will be managed to prevent dust generation and run-off and run-on of water.

8.2.2.3 Temporary Facilities

Temporary facilities installed during the work may include decontamination facilities, portable sanitary facilities, temporary storage units, and temporary fencing. Temporary facilities may be coordinated with the general contractor to the extent practicable.

8.2.2.4 Traffic Control

Traffic control will be managed using portable traffic-control-warning signs, markings, and barriers and, as required, construction personnel to guide access around the remedial areas, and trucks entering and exiting the Site. Prior to commencing remedial activities in each area, the proposed approach to traffic management will be reviewed to ensure that appropriate measures are taken to facilitate ongoing site operations while maintaining a safe working area.

8.2.3 Excavation Activities

Excavation activities will begin with the staking of the excavation area by a licensed land surveyor. Once staked, the appropriate controls and preparation measures will be installed prior to excavation. Based on the planned excavation depths and observed groundwater depths, groundwater management (dewatering) is not anticipated during the work. Based on the large footprint of the deep remedial excavations, excavation support systems (shoring) will not be required as the size of the excavations will allow for appropriate sloping. Estimated excavation areas and volumes are summarized in Sections 7.1 and 7.2 of this RAP.

Depending on requirements of the receiving facility, impacted materials may be direct loaded into trucks for off-site disposal or moved to an on-site designated stockpile/storage area for future load-out. Trucks will be loaded one at a time. Care will be taken not to overload the truck or spill impacted material during loading. A cover will be required for each load. The cover will be securely tied down and checked before a truck leaves the loading area. Each truck will be inspected and cleaned, if necessary, to avoid tracking impacted material and dust outside the loading area.

Work practices will be implemented to limit the generation of dust on-site. These practices include but are not limited to speed limits for on-site machinery, proper covering of stockpiles and exposed soils with sheeting and/or tarps, a dedicated water truck to maintain damp surficial soils, and proper phasing of stripping and excavation activities to limit exposed soils. If visual observations indicate a generation of dust, the on-site environmental personnel will instruct the contractor to immediately perform dust suppression techniques. These techniques may include water spraying or equivalent measures to reduce the amount of dust generated.

Impacted material designated for remedial excavation will be characterized to meet disposal facility requirements, either by in-situ pre-characterization or by stockpile sampling. Impacted

material transported off-site for disposal will be accompanied by a waste manifest that is signed by a Greenwich Public Schools representative for each truck load. A licensed hauler will be required. Approved waste profiles and disposal agreements will be completed prior to transport for off-site disposal

Backfilling of excavation areas will not be conducted until it has been demonstrated that remediation objectives have been achieved. Verification sampling is discussed in Section 8.2.5.1 of this RAP. Barricades will be maintained around excavation areas for each excavation until backfilling is complete.

8.2.4 Fluids Management

Based on planned excavation depths and observed groundwater depths, groundwater management including the dewatering and treatment of groundwater are not anticipated to be required during remedial activities. However, due to the large footprint of the proposed remedial excavations the dewatering of accumulated stormwater within open excavations, and treatment of dewatering effluent prior to discharge or disposal, may be required. Should the handling of dewatering fluids be required the fluids will be pumped into on-site storage tanks for analytical characterization and eventual off-site treatment and disposal. Should large quantities of dewatering fluids be generated and the storage of dewatering fluids in on-site storage tanks be found infeasible, alternative methods for fluid disposal, such as on-site treatment and discharge under a Remediation General Permit to the sanitary sewer will be evaluated.

All groundwater and stormwater management activities during remediation will be conducted in accordance with applicable local, State, and Federal regulations and the CTDEEP General Permit for the Discharge of Groundwater Remediation Waste and the CTDEEP General Permit for Stormwater and Dewatering Wastewaters from Construction Activities.

8.2.5 Verification and Waste Characterization Sampling

The following sections summarize the approach for waste characterization sampling, off-site disposal, and post-excavation verification sampling to confirm the remediation meets the cleanup objectives.

8.2.5.1 Post-Excavation Verification Sampling

Post-excavation verification sampling will be performed across AOC-1 and in the select remedial excavations at AOC-2. Verification sampling will be performed to confirm that the remedial objectives for each area have been achieved. Post-excavation verification sampling is further summarized in Figure 10.

AOC-1 (PCBs)

Post-excavation verification sidewall samples will be collected at a frequency of 1 sample for every 20 linear feet (LF) of excavation sidewall for laboratory analysis of PCBs (EPA Method 8082A). Verification sidewall samples will be collected from the perimeter sidewalls of the two foot remedial excavation that extends across AOC-1 and the sidewalls of the deeper remedial excavations throughout AOC-1. Verification sidewall samples will be collected between 1.5 and 2 feet bgs for the two foot remedial excavation area sidewalls and from the depth of the highest PCB concentration found during delineation sampling at the deeper remedial excavations. Post-excavation verification bottom samples will be collected on a 40 foot grid across the entirety of AOC-1 for analysis of PCBs to allow documentation of underlying PCB concentrations in the remedial action report and decision document for the EUR to further inform future site management decisions.

AOC-1 (VOCs, PAHs, ETPH, Pesticides, & Metals)

Post-excavation verification sidewall samples will be collected at a frequency of 1 sample for every 80 linear LF of excavation sidewall for laboratory analysis of VOCs (EPA Method 8260C), PAHs (EPA Method 8270D), ETPH (CTDEEP ETPH), pesticides (EPA Method 8081B), and metals (EPA Method 6010D). Verification sidewall samples will be collected from the perimeter sidewalls of the two foot remedial excavation that extends across AOC-1 and the sidewalls of the deeper remedial excavations throughout AOC-1. Verification sidewall samples will be collected between 1.5 and 2 feet bgs for the two foot remedial excavation area sidewalls and from the depth of the highest PCB concentration found during delineation sampling at the deeper remedial excavations. Post-excavation verification bottom samples will be collected on an 80 foot grid across the entirety of AOC-1 for analysis of VOCs, PAHs, ETPH, pesticides, and metals to allow documentation of underlying COC concentrations in the remedial action report and decision document for the EUR to further inform future site management decisions.

AOC-2 (Arsenic & Pesticides)

Post-excavation verification sidewall samples will be collected at a frequency of 1 sample for every 20 linear LF of excavation sidewall for laboratory analysis of arsenic (EPA Method 6010D) and pesticides (EPA Method 8081B). Verification sidewall samples will be collected from the depth of the highest arsenic and/or pesticide concentration found during delineation sampling. Post-excavation verification bottom samples will be collected at a frequency of 1 samples per 400 square feet (SF) of excavation bottom for analysis of arsenic and/or pesticides.

Quality Assurance / Quality Control

Quality Assurance/Quality Control (QAQC) sample sets including a field blind duplicate sample and matrix spike and matrix spike duplicate (MSMSD) sample will be collected at a frequency of 1 QAQC sample set for every 20 post-excavation verification sample collected.

The following table summarizes the post-excavation verification soil sampling to be performed across the Subject Property at AOC-1 and AOC-2. The estimated sample totals include QA/QC samples and are based on the designed remedial excavation extents and depths provided in Figure 7. Post excavation sample totals may change during remedial activities should excavation extents and depths increase based on observations made during excavation.

Area	Constituents of Concern	Applicable Regulatory Criteria	Verification Sampling Approach	Estimated Number of Samples
AOC-1	PCBs (8082A)	RDEC	Bottom samples on 40-foot grid	314
AOC-1	PCBs (8082A)	RDEC	Sidewall samples 1 per 20 LF	257
AOC-1	VOC (8260C), PAH (8270D), Pesticides (8081B), ETPH (CT ETPH), & Metals (6010D)	RDEC	Bottom samples on 80-foot grid	82
AOC-1	VOC (8260C), PAH (8270D), Pesticides (8081B), ETPH (CT ETPH), & Metals (6010D)	RDEC	Sidewall samples 1 per 80 LF	65
AOC-2	Arsenic (6010D)	RDEC	Sidewall samples 1 per 20 LF, bottom samples 1 per 400 SF	24
AOC-2	Pesticides (8081B)	GB PMC	Sidewall samples 1 per 20 LF, bottom samples 1 per 400 SF	9

8.2.5.2 Waste Characterization of Excavated Soil

Waste characterization will be completed to meet criteria established by off-site disposal facilities. Representative composite waste characterization samples will be collected either in-situ or from soil stockpiles at a frequency determined by the disposal facility. Sample

locations will be documented in the event segregation of certain soils is required following receipt of analytical data. Samples will be collected in appropriately preserved bottles supplied by the laboratory, stored in ice, and submitted under a chain of custody to the laboratory. Sample frequency and analytical parameters will be determined by the disposal facility.

8.2.5.3 Clean Imported Fill/Backfill

Following the receipt of post-excavation confirmatory soil sample analytical data confirming remedial excavations have met remedial requirements, backfilling of the remedial excavations will commence. Excavations will be backfilled with clean fill with concentrations below RSRs, or other appropriate materials such as subbase (processed gravel, clean stone, DGA, etc.) or topsoil. The clean fill, subbase, and topsoil materials will be imported from off-site sources. Imported fill will be sampled, analyzed, and approved prior to being transported to the Subject Property.

8.2.5.4 On-Site Soil Reuse

Reuse of existing on-site soil below the proposed ECs is anticipated in select areas of the Subject Property to meet grading requirements. Following completion of proposed remedial excavations, certain areas of AOC-1 will require further excavation to reach proposed grades prior to construction of the ECs. Additionally, certain areas of AOC-1 will require additional filling to reach proposed grades prior to construction of the ECs. In areas where existing elevations are higher than the proposed grades and further excavation is required to reach proper depths to construct the ECs, additional soil will be excavated and stored in properly designated stockpiles pending approval for potential future reuse. Stockpiled soil proposed for reuse will be screened by qualified environmental personnel for visual or olfactory evidence of impacts and soil characterization samples will be collected from the stockpiles at a rate of 1 sample per 500 cubic yards of soil for analysis of site-specific COCs. QAQC sample sets including a field blind duplicate sample and MSMSD sample will be collected at a frequency of 1 QAQC sample set for every 20 soil reuse characterization sample collected.

If analytical results are consistent with existing soils to remain at the Subject Property, the stockpiled material will be authorized for reuse below the proposed ECs. Soil reuse locations and the associated analytical characterization data will be documented and provided in the remedial action report and decision document for the EUR to further inform future site management decisions.

8.2.6 Air Monitoring

On-site air monitoring will be conducted to evaluate working conditions, in order to minimize potential exposures to workers and surrounding receptors. The following sections describe air monitoring procedures to be completed during remedial operations.

8.2.6.1 Real-Time Dust and VOC Monitoring

During remedial soil excavation and movement activities, qualified environmental personnel will conduct real-time monitoring of dust and VOC levels using direct reading instruments that are designed to monitor air quality on a real-time basis at locations upwind and downwind of excavation and soil movement activities. Background monitoring will be conducted at least 15 minutes prior to the start of intrusive activities at each location. Each monitoring station will include a dust monitor with particulate sensors equipped with filters to detect particulates less than 10 microns in diameter (PM10), the ability to autocorrect for relative air humidity, and a PID equipped with a 10.6 eV (electron-volt) lamp. The monitoring instruments will be calibrated before use. The instruments will be housed within a weatherproof case and the dust monitor will be equipped with an omni-directional probe to minimize wind interference. The dust and VOC data will be logged at 60 second intervals into a cloud based database where real-time dust and VOC data can be reviewed, analyzed, and stored by the environmental personnel. The database will be capable of setting threshold alerts for dust and VOC data that will trigger real-time alerts to environmental personnel mobile phones via email and/or text messages, allowing immediate dust and vapor suppression measure to be implemented. The monitoring data will be downloaded daily and weather and wind information will be noted and recorded.

Visual observation of dust conditions will be also be performed during work activities. If visual observations indicate generation of dust, the on-site environmental personnel will instruct the contractor to perform dust suppression techniques. These techniques may include water spraying or equivalent measures to reduce the amount of dust generated. Olfactory observations will also be performed during work activities. The contractor will be required to implement odor control measures if needed. These measures may include, but are not limited to, spraying of odor control foams, limiting the amount of open excavation at any one time, and use of odor neutralizers.

8.2.6.2 Action Levels

The action level for airborne dust is based on the EPA National Ambient Air Quality Standard (NAAQS) for PM10 particulate of 150 micrograms per cubic meter (µg/m3). The action level for organic vapors will be 5.0 ppm above background in ambient air (sustained for a 15-minute reading).

If particulate levels are 100 µg/m3 greater than background (up-wind) for a 15-minute period, dust suppression must be employed. Work may continue with dust suppression techniques provided PM10 levels do not exceed 150 µg/m3 above background. If, after implementation of dust techniques, PM10 levels are still greater than 150 µg/m3 above background, work must be stopped and a re-evaluation of activities will be initiated. Work may resume provided that dust suppression measures and other controls are successful in reducing the PM10 concentrations to 150 µg/m3 and in preventing visible dust migration.

If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring will be continued. If levels rapidly decrease (per instantaneous readings) below 5 ppm above background, work activities may resume with continued monitoring. If total VOC levels are in excess of 5 ppm above background but are less than 25 ppm, work activities will be halted. The source of vapors will be identified, corrective actions will be taken to abate emissions and monitoring will then continue. If the VOC level is above 25 ppm at the perimeter of the work zone, activities will be shut down.

8.2.7 Construction Contingency Procedures

Unforeseen conditions encountered in the field during remedial activities may require potential changes to the proposed remedial design. The following sub-sections describe construction contingency procedures to address potentially unforeseen conditions.

8.2.7.1 Utilities

Excavation will proceed cautiously to minimize the potential to encounter unknown utilities or to disturb known utilities. In the event utilities are known to be present or encountered during excavation the Town of Greenwich will be notified to determine the type and status of the utility. If the utility is to remain the excavation work will proceed with hand tools or similar practices to ensure disturbance of the utilities is minimal and the potential for damage to the utility is mitigated. Any utilities to remain within the remedial area will be inspected for debris and soil prior to backfilling to ensure impacted materials are removed. Upon completion of remedial activities the utilities will be backfilled with the appropriate materials to ensure appropriate utility support.

8.2.7.2 Severe Weather

In the event of severe weather, soil stockpiles will be covered with polyethylene sheeting and supported with the appropriate ballast. Remedial activities will be limited until weather conditions improve and work can continue in a safe manner.

8.2.7.3 Exceedance of Air Monitoring Action Levels

Dust mitigation measures will be employed in accordance with the action levels and practices summarized in Section 8.2.6 of this RAP.

8.2.7.4 Safety Hazards

Stop work practices will be followed should any condition arise that may represent a risk of hard to worker or public safety. All employees working on the site will have stop work authority to ensure potential hazards are fully identified and the procedures to complete the work safely are in place prior to proceeding.

8.2.7.5 Change in Conditions

Should unexpected conditions be encountered during remedial activities, work will be paused to evaluate and discuss with the project team. Such unexpected conditions may include unknown utilities or a new source of impacts or indication of impacts not consistent with the site COCs. The pause in work will allow for the time to determine a safe and adequate way to address the new condition and continue remedial activities in that area.

8.3 Post-Remedial Monitoring

Following remedial activities monitoring will be performed to ensure remaining COCs underlying the ECs remain physically isolated from human contact, and do not migrate into groundwater underlying the Subject Property and to off-site receptors. Post-remedial monitoring will include annual inspections of the ECs to ensure there are no changes in site conditions and annual collection of groundwater monitoring samples from both down-gradient and up-gradient groundwater monitoring wells.

During remedial excavation activities 5 of the 10 existing groundwater monitoring wells installed during Langan's previous investigations will be destroyed. An additional eight groundwater monitoring wells located down-gradient and up-gradient of AOC-1 are proposed to be installed following completion of remedial activities. Post-remedial groundwater monitoring will utilize five existing monitoring wells located to the north, south, and east of the Western Middle School buildings as well as the eight proposed groundwater monitoring wells around AOC-1; totaling 13 groundwater monitoring wells proposed for annual sampling. Annual groundwater monitoring samples will be analyzed for site-specific COCs, including VOCs (EPA Method 8260C), PAHs (EPA Method 8270D), PCBs (EPA Method 8082A), pesticides (EPA Method 8081B), and metals (EPA Method 6010D). Post-remediation groundwater monitoring well locations are provided on Figure 11. Post-remedial EC inspections and groundwater monitoring findings will be reported annually to the CTDEEP.

Post-remedial monitoring activities will be further described in the Operations, Maintenance, and Monitoring Plan to be provided in the forthcoming Engineered Control Variance Request Part II application. The three proposed ECs to be implemented at the Subject Property will be monitored and inspected in accordance with the Operations, Maintenance, and Monitoring Plan.

9.0 POST REMEDIATION CONCEPTIUAL SITE MODEL

Following remediation of the Subject Property, the current exceedances to the RSR criteria will have been mitigated such that compliance with the RSRs can be demonstrated, and an updated Conceptual Site Model can be prepared to support a verification of compliance with the RSRs for the Subject Property.

Following completion of remedial activities, the Subject Property will be restored to its current condition and use with many improvements for accessibility and use. The Athletic Fields will remain multisport athletic fields; however, they will be improved with artificial turf surfaces with paved access points for athletes, spectators, and maintenance staff. Surrounding forested and overgrown undeveloped land will be improved with grass landscaped areas. Shallow impacted soils will be removed and the newly installed artificial turf fields, paved walkways, and landscaped areas will be installed over, and rendering inaccessible, any remaining deep impacted materials. An EUR will be recorded for the Subject Property to ensure soil rendered inaccessible by the artificial turf fields, paved walkways, and clean soil cap is not disturbed in the future. This approach is a protective method of addressing the current impacted soil at the Subject Property.

10.0 REPORTING REQUIREMENTS

Remedial oversight responsibilities include the design of remedial construction activities, management of the activities, and the preparation and maintenance of records for as-built documentation. These responsibilities include documenting the project is completed in accordance with the elements of this RAP and accepted industry and engineering standards.

10.1 Field Documentation

Detailed records of remedial construction activities will be maintained, including records of materials entering and leaving the Subject Property. This includes manifests and weight tickets from the facilities which receive impacted materials from the Subject Property, and records and/or weight tickets associated with materials imported to the Subject Property. No materials will be permitted to be imported to the Subject Property without appropriate prior approval. In addition, the following record will be maintained:

- Photographic documentation of remedial construction activities including, but not limited to, completed remedial excavations, installation of remedial components, excavation and backfilling operations, and other pertinent observations;
- Logs of daily activities, site conditions, weather conditions, and observations;
- Records of changes to remedial design elements to accommodate field conditions;
- Documenting segregation (if needed), storage, and accounting of wastes that may be stockpiled;
- Documenting sampling locations and measurements taken relative to surveyed locations;
- Documenting erosion control measures are properly employed and maintained, including a record of required repairs or maintenance;
- Documenting site security measures, including a site visitor log;
- Documenting volumes of wastes generated;
- Maintaining waste disposal and transportation documentation; and,
- Documenting decontamination procedures prior to demobilization.

10.2 Post-Remediation Reporting Requirements

Following completion of remedial activities, a Remedial Action Report (RAR) will be prepared for the Subject Property and submitted to the CTDEEP. The RAR will describe the completed work and will contain the items discussed below. As-built drawings showing the vertical and horizontal limits of remedial excavations, and final grades upon completion of backfilling operations will be

prepared. Post-remedial survey information coupled with existing survey information will be used in support of the EUR. The following information will also be prepared in the RAR:

- Sample analytical data compared to RSR criteria, as applicable (e.g. post excavation verification samples, waste characterization samples, soil reuse characterization samples);
- Laboratory reports;
- As-built figures showing extents of remediation and sampling locations;
- Waste disposal documentation (e.g. manifests, bills-of-lading, certificates of disposal);
- Waste disposal summary including the weights, volumes, and disposition of excavated materials;
- Documentation of imported materials (clean fill, topsoil, aggregate); and,
- Select photographs of remedial activities.

11.0 PROJECT SCHEDULE

Implementation of the RAP will require CTDEEP and USEPA approval. Preliminary schedule milestones are provided below. The field schedule is subject to the timing of these approvals, weather-related delays, and artificial turf contractor construction schedule.

Milestone	Date
Request for Bid	October 2022
Contractor Selection	November 2022
Contractor Mobilization	May 2023
Remedial Excavation and Off-site Disposal	June through November 2023
Remedial Excavation Backfilling	June through December 2023
Engineered Controls Construction	August through December 2023
Contractor Demobilization	January 2024

TABLES

LIST OF TABLES

Table 1A
June 2016 Phase II ESI Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID **Sampling Depth (feet)** **Sampling Date**	**Residential Direct Exposure Criteria**	**GB Pollutant Mobility Criteria**	**SB-1** **2-2.5** **6/9/2016**	**SB-2** **2-2.5** **6/9/2016**	**SB-3** **2-2.5** **6/9/2016**	**SB-3 (DUP-1)** **2-2.5** **6/9/2016**
Volatile Organics, CT RCP List (mg/kg)	~	~	ND<Varies	ND<Varies	ND<Varies	ND<Varies
SVOCs by 8270 (mg/kg)						
Carbazole*	31	1	ND<0.535	0.640	ND<0.581	ND<0.583
Chrysene*	84	1	ND<0.535	0.552	ND<0.581	ND<0.583
Fluoranthene	1,000	56	ND<0.535	1.130	1.000	0.721
Phenanthrene	1,000	40	ND<0.535	0.723	0.592	ND<0.583
Pyrene	1,000	40	ND<0.535	1.030	0.893	0.634
Herbicides, CT RCP (mg/kg)	~	~	ND<Varies	ND<Varies	ND<Varies	ND<Varies
Pesticides, CT RCP Target List (mg/kg)						
4,4-DDE*	1.8	0.02	ND<0.00267	ND<0.00275	ND<0.00290	0.0183
4,4'-DDT*	1.8	0.02	0.00347	ND<0.00275	ND<0.00290	0.0204
Chlordane, total	0.49	0.066	ND<0.0106	ND<0.0109	ND<0.0115	0.218
Heptachlor epoxide	0.067	0.02	ND<0.00267	ND<0.00275	ND<0.00290	0.00584
Polychlorinated Biphenyls (PCB RCP) (mg/kg)						
Total PCBs	1	NE	ND<0.0267	0.275	0.0533	0.104
Extractable Total Petroleum Hydrocarbons (ETPH) (mg/kg)						
ETPH	500	2,500	11.3	ND<11.0	116	112
Metals, CTDEP RCP (mg/kg)						
Antimony	27	NE	0.54	0.55	0.58	0.58
Arsenic	10	NE	4.73	**29.30**	**18.6**	**16.2**
Barium	4,700	NE	198	649	256	215
Beryllium	2	NE	ND<0.107	0.296	ND<0.116	ND<0.117
Cadmium	34	NE	0.471	0.679	0.962	0.895
Chromium	NE	NE	89.2	50.5	36.7	34.7
Copper	2,500	NE	35.8	52.0	48.5	46.7
Lead	400	NE	25.5	27.0	128	117
Nickel	1,400	NE	43.7	30.9	20.9	19.9
Selenium	340	NE	3.43	5.62	3.46	2.63
Silver	340	NE	0.54	0.55	0.58	0.58
Thallium	5.4	NE	1.07	1.10	1.16	1.17
Vanadium	470	NE	61.1	46.5	39.1	32.3
Zinc	20,000	NE	64.2	437	373	273
Mercury by 7473 (mg/kg)						
Mercury	20	NE	ND<0.0321	ND<0.0330	0.144	0.168

NOTES:
ND = Not detected above laboratory reporting limits
NE = Not established
"~" = Criteria varies based on compound

Bold indicates an exceedance of the Residential Direct Exposure Criteria
Shading indicates an exceedence of the GB Pollutant Mobility Criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 1B
June 2016 Phase II ESI Shallow Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Parameters	Residential Direct Exposure Criteria	SS-1 0 to 6 inches 6/9/2016	SS-2 0 to 6 inches 6/9/2016	SS-3 0 to 6 inches 6/9/2016	SS-4 0 to 6 inches 6/9/2016	SS-5 0 to 6 inches 6/9/2016	SS-6 0 to 6 inches 6/9/2016	SS-7 0 to 6 inches 6/9/2016	SS-8 0 to 6 inches 6/9/2016
Metals, CTDEP RCP (mg/kg)									
Antimony	27	0.64	0.69	0.57	0.57	0.56	0.55	0.59	0.58
Arsenic	10	**11.6**	7.79	2.95	3.15	**37.0**	2.36	7.79	7.01
Barium	4,700	228	189	149	156	445	83.0	283	182
Beryllium	2	0.13	0.14	0.11	0.11	0.11	0.11	0.12	0.12
Cadmium	34	1.29	0.844	0.371	0.406	0.891	ND<0.331	1.23	0.474
Chromium	4,000	121	60.3	32.4	45.0	26.2	19.1	104	36.4
Copper	2,500	59.1	45.3	36.0	36.3	40.9	20.4	61.2	89.0
Lead	400	75.8	91.2	21.1	19.2	46.5	22.4	63.5	81.0
Nickel	1,400	62.6	33.3	21.4	28.2	17.1	15.5	51.5	31.2
Selenium	340	2.73	3.14	3.14	3.26	4.19	1.92	3.18	2.86
Vanadium	470	47.6	50.3	43.0	45.4	35.9	28.8	65.5	43.9
Zinc	20,000	157	146	72.2	76.9	477	51.0	147	130
Mercury by 7473 (mg/kg)									
Mercury	20	0.104	0.115	0.0844	0.0504	0.0773	0.109	0.102	0.0880

NOTES:
ND = Not detected above laboratory reporting limits
NE = Not established
"~" = Criteria varies based on compound

Bold indicates an exceedance of the Residential Direct Exposure Criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-9 7/27/2016	SS-10 7/27/2016	SS-11 7/27/2016	SS-12 7/27/2016	SS-13 7/27/2016	SS-14 7/27/2016	SS-14 (DUP-1) 7/27/2016	SS-15 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
2,4-Dinitrotoluene	0.9*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
2,6-Dinitrotoluene	0.9*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
4-Chloroaniline	3.1*	31*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Benzo(a)anthracene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Benzo(a)pyrene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Benzo(b)fluoranthene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Bis(2-chloroethyl)ether	1	2.4	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Dibenzofuran	1.4*	1.4*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Fluoranthene	1,000	56	ND<0.518	ND<0.789	ND<0.746	0.67 D	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Hexachlorobenzene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594 IS-06	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Nitrobenzene	4*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.518	ND*<0.789	ND*<0.746	ND*<0.594	ND*<0.615	ND*<0.766	ND*<0.701	ND*<0.793
Pentachlorophenol	5.1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0207	ND<0.0315	ND<0.0298	ND<0.0238	ND<0.0246	ND<0.0306	ND<0.028	ND<0.0317
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	ND<0.00259	ND<0.00394	ND<0.00373	ND<0.00297	ND<0.00308	ND<0.00383	ND<0.0035	ND<0.00396
Chlordane, total	0.49	0.066	***0.8 D***	***3.6 D***	***3.95 D***	ND<0.0118	***1.93 D***	***2.02 D***	***2.68 D***	***3.23 D***
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	ND<0.00259	ND<0.0394	ND<0.0373	0.298	ND<0.0308	ND<0.0383	ND<0.035	ND<0.0396
Aroclor 1260	NE	NE	ND<0.00259	ND<0.0394	0.279	0.179	ND<0.0308	0.0936	0.15	0.088
Aroclor 1262	NE	NE	ND<0.00259	ND<0.0394	ND<0.0373	ND<0.0297	ND<0.0308	ND<0.0383	ND<0.035	ND<0.0396
Total PCBs	1	NE	ND<0.00259	ND<0.0394	0.279	0.477	ND<0.0308	0.0936	0.15	0.088
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Arsenic	10	NE	2.5	8.46	7.79	8.88	6.48	6.39	6.82	7.46
Barium	4,700	NE	50.6	166	211	206	119	187	189	205
Beryllium	2	NE	0.159	ND<0.158	0.164	ND<0.119	ND<0.123	0.178	0.147	0.161
Cadmium	34	NE	0.558	1.67	4.05	2.03	0.813	2.85	2.92	1.71
Chromium	4,000	NE	14.7	65.9	103	114	58.8	86.4	91.2	70.7
Copper	2,500	NE	15.1	43.1	137	109	32.3	50.8	50.8	44.5
Lead	400	NE	13.3	142	209	218	95.7	192	220	145
Mercury	20	NE	ND<0.0311	0.146	0.156	0.178	0.138	0.166	0.212	0.169
Nickel	1,400	NE	10.1	33.1	52.6	51.9	28.4	37.4	39.1	34.2
Selenium	340	NE	1.38	2.34	4.56	3.76	3.64	3.76	4.22	4.86
Vanadium	470	NE	19.7	52.8	56.4	62.3	51.1	55.7	59.2	56.3
Zinc	20,000	NE	33.8	186	271	214	109	244	219	197

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-16 7/27/2016	SS-17 7/27/2016	SS-18 7/27/2016	SS-19 7/27/2016	SS-20 7/27/2016	SS-21 7/27/2016	SS-22 7/27/2016	SS-23 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
2,4-Dinitrotoluene	0.9*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
2,6-Dinitrotoluene	0.9*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
4-Chloroaniline	3.1*	31*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Benzo(a)anthracene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Benzo(a)pyrene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Benzo(b)fluoranthene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Bis(2-chloroethyl)ether	1	2.4	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Dibenzofuran	1.4*	1.4*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Fluoranthene	1,000	56	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Hexachlorobenzene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Nitrobenzene	4*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.633	ND*<0.617	ND*<0.697	ND*<0.678	ND*<0.601	ND*<0.631	ND*<0.634	ND*<0.802
Pentachlorophenol	5.1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0253	ND<0.0247	ND<0.0279	ND<0.0271	ND<0.024	ND<0.0252	ND<0.0254	0.061
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	*0.0591 D*	ND<0.00308	ND<0.00348	ND<0.00339	ND<0.003	ND<0.00315	ND<0.00317	ND<0.00401
Chlordane, total	0.49	0.066	ND<0.0125	***2.31 D***	***1.74 D***	***3.16 D***	ND<0.0119	***0.985 D***	***6.76 D***	***5.48 D***
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	0.21	ND<0.0308	ND<0.0348	ND<0.0339	0.331	ND<0.0315	ND<0.0317	ND<0.0401
Aroclor 1260	NE	NE	0.213	0.0988	0.0536	ND<0.0339	0.199	ND<0.0315	ND<0.0317	ND<0.0401
Aroclor 1262	NE	NE	ND<0.0317	ND<0.0308	ND<0.0348	ND<0.0339	ND<0.03	0.199	ND<0.0317	ND<0.0401
Total PCBs	1	NE	0.424	0.0988	0.0536	ND<0.0339	0.529	0.199	ND<0.0317	ND<0.0401
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	2.54
Arsenic	10	NE	7.17	5.8	6.82	8.8	8.8	4.54	3.65	6.26
Barium	4,700	NE	236	163	195	422	225	133	164	350
Beryllium	2	NE	ND<0.127	ND<0.123	ND<0.139	ND<0.136	ND<0.12	ND<0.126	ND<0.127	ND<0.16
Cadmium	34	NE	3.65	1.27	1.12	2.67	2.62	1.02	0.862	4.4
Chromium	4,000	NE	167	55.6	46.9	128	128	40.8	38.9	289
Copper	2,500	NE	98.6	54.2	35.2	131	78	66.2	48.8	155
Lead	400	NE	351	226	171	**478**	228	171	159	372
Mercury	20	NE	0.277	0.19	0.128	0.2	0.281	0.118	0.0988	0.228
Nickel	1,400	NE	62.3	28.7	22.4	87.2	58.7	31.4	22.2	94.3
Selenium	340	NE	7.5	4.47	2.64	4.54	4.64	4.18	4.44	3.02
Vanadium	470	NE	97.3	50.8	38.6	62.1	65.6	74.8	40.1	48.6
Zinc	20,000	NE	331	216	156	461	243	260	161	479

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID / Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-24 7/27/2016	SS-25 7/27/2016	SS-26 7/27/2016	SS-26 (DUP-2) 7/27/2016	SS-27 7/27/2016	SS-28 7/27/2016	SS-29 7/27/2016	SS-30 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
2,4-Dinitrotoluene	0.9*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
2,6-Dinitrotoluene	0.9*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
4-Chloroaniline	3.1*	31*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Benzo(a)anthracene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Benzo(a)pyrene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Benzo(b)fluoranthene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Bis(2-chloroethyl)ether	1	2.4	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Dibenzofuran	1.4*	1.4*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Fluoranthene	1,000	56	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Hexachlorobenzene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Nitrobenzene	4*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.673	ND*<0.595	ND*<0.554	ND*<0.555	ND*<0.596	ND*<0.696	ND*<0.627	ND*<0.716
Pentachlorophenol	5.1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0269	ND<0.0238	ND<0.0222	ND<0.0222	ND<0.0238	ND<0.0279	ND<0.0251	ND<0.0286
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	*0.0607 D*	ND<0.00297	ND<0.00277	ND<0.00278	ND<0.00298	ND<0.00348	ND<0.00313	ND<0.00358
Chlordane, total	0.49	0.066	ND<0.0133	***0.741 D***	ND<0.011	*0.155 D*	***4.13 D***	ND<0.0138	*0.302 D*	***5.85 D***
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	0.29	ND<0.0297	0.0996	0.094	ND<0.0298	0.443	ND<0.0313	ND<0.0358
Aroclor 1260	NE	NE	0.241	0.0906	ND<0.0277	ND<0.0278	0.15	0.652	ND<0.0313	ND<0.0358
Aroclor 1262	NE	NE	ND<0.0337	ND<0.0297	ND<0.0277	ND<0.0278	ND<0.0298	ND<0.0348	ND<0.0313	ND<0.0358
Total PCBs	1	NE	0.531	0.0906	0.0996	0.094	0.15	**1.09**	ND<0.0313	ND<0.0358
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	7.62	ND<0.595	ND<0.554	ND<0.555	ND<0.596	3.31	ND<0.627	ND<0.716
Arsenic	10	NE	**13.4**	**10.2**	2.35	3.04	6.78	**12.2**	4.61	7.19
Barium	4,700	NE	874	267	80.3	64.7	157	808	85.2	196
Beryllium	2	NE	ND<0.135	ND<0.119	0.169	0.114	0.153	ND<0.139	0.165	0.293
Cadmium	34	NE	11.7	1.95	ND<0.332	ND<0.333	1.62	14.4	0.544	1.29
Chromium	4,000	NE	246	83.6	17.7	16.1	104	318	30.5	50.3
Copper	2,500	NE	340	120	19.9	20.5	74.7	265	32.3	102
Lead	400	NE	**1,640**	357	22.4	33.6	299	**1,190**	76.5	**423**
Mercury	20	NE	1.15	0.389	ND<0.0332	ND<0.0333	0.197	1.54	0.0797	0.155
Nickel	1,400	NE	108	49	15.9	14.8	125	120	19.7	61.1
Selenium	340	NE	7.53	4.46	1.34	2.9	3.04	6.35	3.46	4.7
Vanadium	470	NE	71.3	64.4	24.3	24.4	33.6	69.5	35.5	42.1
Zinc	20,000	NE	1,310	422	52.6	63.5	231	1,070	108	351

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID / Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-31 7/27/2016	SS-32 7/27/2016	SS-33 7/27/2016	SS-34 7/27/2016	SS-35 7/27/2016	SS-36 7/27/2016	SS-37 7/27/2016	SS-38 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
2,4-Dinitrotoluene	0.9*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
2,6-Dinitrotoluene	0.9*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
4-Chloroaniline	3.1*	31*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Benzo(a)anthracene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Benzo(a)pyrene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Benzo(b)fluoranthene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Bis(2-chloroethyl)ether	1	2.4	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Dibenzofuran	1.4*	1.4*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Fluoranthene	1,000	56	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Hexachlorobenzene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Nitrobenzene	4*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.645	ND*<0.526	ND*<0.63	ND*<0.564	ND*<0.65	ND*<0.64	ND*<0.632	ND*<0.619
Pentachlorophenol	5.1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0258	ND<0.0211	ND<0.0252	ND<0.0226	ND<0.026	ND<0.0256	ND<0.0253	ND<0.0248
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	*0.0565 D*	ND<0.00263	ND<0.00315	0.00519 D	ND<0.00325	ND<0.0032	ND<0.00316	ND<0.00309
Chlordane, total	0.49	0.066	***1.51 D***	ND<0.0104	***1.7 D***	ND<0.0112	ND<0.0129	***0.778 D***	ND<0.0125	ND<0.0123
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	0.775	ND<0.0263	ND<0.0315	ND<0.0282	0.129	ND<0.032	4.19 D	0.359
Aroclor 1260	NE	NE	0.191	ND<0.0263	0.0519	ND<0.0282	0.108	0.0457	0.845 D	0.384
Aroclor 1262	NE	NE	ND<0.0322	ND<0.0263	ND<0.0315	ND<0.0282	ND<0.0325	ND<0.032	ND<0.316	ND<0.0309
Total PCBs	1	NE	0.965	ND<0.0263	0.0519	ND<0.0282	0.237	0.0457	**5.03 D**	0.742
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Arsenic	10	NE	7.6	3.49	6.92	2.83	5.17	5.86	7.17	7.03
Barium	4,700	NE	250	65.4	168	75.1	125	128	205	240
Beryllium	2	NE	0.19	0.181	0.241	ND<0.113	0.25	ND<0.128	ND<0.126	0.336
Cadmium	34	NE	2.4	ND<0.316	1.06	ND<0.338	3.87	0.633	2.69	2.03
Chromium	4,000	NE	98.1	12.1	69.7	15.4	142	72.2	84.9	85.5
Copper	2,500	NE	114	15.6	91.3	15.7	49.7	37.5	97.7	119
Lead	400	NE	**412**	7.74	253	17.3	168	110	244	303
Mercury	20	NE	0.281	ND<0.0316	0.139	ND<0.0338	0.21	0.137	0.129	0.433
Nickel	1,400	NE	109	11.4	80.8	10.2	187	108	50.4	127
Selenium	340	NE	4.29	1.94	3.63	ND<1.13	3.25	3.15	3.15	4.42
Vanadium	470	NE	52.7	20.8	42	14.7	54.5	35.9	58	35.1
Zinc	20,000	NE	363	28.6	243	46.4	168	122	388	395

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 3A
October 2016 Chlordane Delineation Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-9S-10 0 - 3 10/7/2016	SS-9N-10 0 - 3 10/7/2016	SS-9W-10 0 - 3 10/7/2016	SS-9E-10 0 - 3 10/7/2016
Pesticides, CT RCP Target List (mg/kg)					
Chlordane, total	0.49	ND<0.033	ND<0.033	0.0369	ND<0.033

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-22S-10 0 - 3 10/7/2016	SS-22N-10 0 - 3 10/7/2016	SS-22W-10 0 - 3 10/7/2016	SS-22E-10 0 - 3 10/7/2016	SS-DUP_10.7.16 0 - 3 10/7/2016
Pesticides, CT RCP Target List (mg/kg)						
Chlordane, total	0.49	ND<0.033	ND<0.033	ND<0.033	ND<0.033	ND<0.033

Notes:
1. Langan utilized the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) Residential Direct Exposure Criteria (RDEC) as a screening level criterion to identify driver compounds that may require additional assessment.
2. ND = Not detected above laboratory reporting limits.
3. mg/kg = milligram per kilogram

Table 3B
August and Ocotober 2016 Lead Delineation Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	Site-Specific Action Level	SS-24N-10 0 - 3 8/9/2016	SS-24E-10 0 - 3 8/9/2016	SS-24S-10 0 - 3 8/9/2016	SS-24W-10 0 - 3 8/9/2016	SS-24N-20 0 - 3 8/9/2016	SS-24E-20 0 - 3 8/9/2016	SS-24S-20 0 - 3 8/9/2016	SS-24W-20 0 - 3 8/9/2016
Lead by EPA 6010 (mg/kg)										
Lead	400	606	**449**	**721**	**1,390**	**470**	252	**537**	**542**	**413**

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	Site-Specific Action Level	SS-28N-10 0 - 3 8/9/2016	SS-28E-10 0 - 3 8/9/2016	SS-28S-10 0 - 3 8/9/2016	SS-28W-10 0 - 3 8/9/2016	SS-28N-20 0 - 3 8/9/2016	SS-28W-20 0 - 3 8/9/2016
Lead by EPA 6010 (mg/kg)								
Lead	400	606	**706**	340	288	**850**	259	**739**

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	Site-Specific Action Level	SS-28W-30 0 - 3 10/7/2016	SS-28W-40 0 - 3 10/7/2016	SS-28W20-NW10 0 - 3 10/7/2016	SS-28W20-N10 0 - 3 10/7/2016	SS-28W20-SW10 0 - 3 10/7/2016	SS-28W20-S10 0 - 3 10/7/2016	SS-28W20-S20 0 - 3 10/7/2016
Lead by EPA 6010 (mg/kg)									
Lead	400	606	345	293	361	**467**	**703**	**476**	295

Notes:

1. Langan utilized the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) Residential Direct Exposure Criteria (RDEC) as a screening level criterion to identify driver compounds that may require additional assessment. As part of Langan's Human Health Risk Assesment (HHRA), an action level of 606 mg/kg was calculated for lead in soil in accordance with the United States Environmental Protection Agency's (USEPA) Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead in children. This remediation action level for lead was approved by the Connecticut Department of Public Health (DPH).
2. Soil samples highlighted in yellow represent the outermost delineation samples that are used to define the areas of the Subject Property slated for remedial excavation to 1 foot below ground surface (bgs).
3. Bold indicates an exceedance of the RDEC.
4. Shading indicates an exceedance of the site-specific action level.
5. mg/kg = milligram per kilogram

Table 3C
October 2016 Recreational Area Soil Analytical Results
Western Middle School
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-39-3 0 - 3 10/5/2016	SS-39-12 12 10/5/2016	SS-40-3 0 - 3 10/5/2016	SS-40-12 12 10/5/2016	SS-41-3 0 - 3 10/5/2016	SS-41-12 12 10/5/2016	DUP (SS-41-12) 12 10/5/2016	SS-42-3 0 - 3 10/5/2016	SS-42-12 12 10/5/2016
Pesticides (mg/kg)										
Chlordane, total	0.49	ND<0.0588	NA	0.326 D	NA	ND<0.0577	NA	NA	ND<0.0569	NA
PCBs (mg/kg)										
Aroclor 1254	NE	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274
Total PCBs	1	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-43-3 0 - 3 10/5/2016	SS-43-12 12 10/5/2016	SS-44-3 0 - 3 10/5/2016	SS-44-12 12 10/5/2016	SS-45-3 0 - 3 10/5/2016	SS-45-12 12 10/5/2016	SS-46-3 0 - 3 10/5/2016	SS-46-12 12 10/5/2016
Pesticides (mg/kg)									
Chlordane, total	0.49	ND<0.06	NA	ND<0.0565	NA	ND<0.0577	NA	ND<0.0565	NA
PCBs (mg/kg)									
Aroclor 1254	NE	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162
Total PCBs	1	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162

Notes:
1. Langan utilized the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) Residential Direct Exposure Criteria (RDEC) as a screening level criterion to identify driver compounds that may require additional assessment.
2. Only pesticides and PCBs with detections are shown on this table.
3. D = Result is from an analysis that required a dilution.
4. ND = Not detected above laboratory reporting limits.
5. NE = Criteria not established for this compound.
6. mg/kg = milligram per kilogram

Table 3D
October 2016 Recreational Area Soil Analytical Results
Western Middle School
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SB-4 (3") 0 - 3 10/5/2016	SB-4 (1') 12 10/5/2016	SB-5 (3") 0 - 3 10/5/2016	SB-5 (1') 12 10/5/2016	SB-6 (3") 0 - 3 10/5/2016	SB-6 (1') 12 10/5/2016	DUP (SB-6 (1')) 12 10/5/2016	SB-7 (3") 0 - 3 10/5/2016	SB-7 (1') 12 10/5/2016
Pesticides (mg/kg)										
Chlordane, total	0.49	ND<0.0588	NA	0.326 D	NA	ND<0.0577	NA	NA	ND<0.0569	NA
PCBs (mg/kg)										
Aroclor 1254	NE	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274
Total PCBs	1	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SB-8 (3") 0 - 3 10/5/2016	SB-8 (1') 12 10/5/2016	SB-9 (3") 0 - 3 10/5/2016	SB-9 (1') 12 10/5/2016	SB-10 (3") 0 - 3 10/5/2016	SB-10 (1') 12 10/5/2016	SB-11 (3") 0 - 3 10/5/2016	SB-11 (1') 12 10/5/2016
Pesticides (mg/kg)									
Chlordane, total	0.49	ND<0.06	NA	ND<0.0565	NA	ND<0.0577	NA	ND<0.0565	NA
PCBs (mg/kg)									
Aroclor 1254	NE	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162
Total PCBs	1	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162

NOTES:
D = Result is from an analysis that required a dilution
ND = Not detected above laboratory reporting limits
NE = Not established

1. Only pesticide and PCB detections are shown on this table

Table 4A
October 2016 to 2017 SS-28 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	SS-28 7/27/2016 3"	SS-28-1' 10/18/2016 1'	SS-28-2' 10/18/2016 2'	SS-28-W10-3" 10/18/2016 3"	SS-28-W10-2' 10/18/2016 2'	SS-28-W20-3" 10/18/2016 3"	SS-28-W20-2' 10/18/2016 2'
PCBs (mg/kg)								
Aroclor 1016	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1221	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1232	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1242	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1248	NE	0.443	0.506	ND<0.0271	ND<0.596	ND<0.0265	0.812	0.0632
Aroclor 1254	NE	ND<0.0348	0.573	0.125	10.3 D	0.0586	1.51	0.0977
Aroclor 1260	NE	0.652	ND<0.0307	0.0623	ND<0.596	ND<0.0265	0.737	0.0617
Aroclor 1262	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1268	NE	ND<0.0348	0.1	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Total PCBs	1	**1.09**	**1.18**	0.187	**10.3 D**	0.0586	**3.06**	0.223

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	SS-28-W20S10-3" 11/29/2016 3"	SS-28-W20N10-3" 11/29/2016 3"	SS-28-W30-3" 10/29/2016 3"	SS-28-E10-3" 10/18/2016 3"	SS-28-E10-1' 10/18/2016 1'	SS-28-N10-3" 10/18/2016 3"	SS-28-N10-2' 10/18/2016 2'
PCBs (mg/kg)								
Aroclor 1016	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1221	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1232	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1242	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1248	NE	ND<0.0325	ND<0.0324	ND<0.0316	0.0931	ND<0.0295	0.991	2.9 D
Aroclor 1254	NE	ND<0.0325	ND<0.0324	ND<0.0316	0.161	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1260	NE	ND<0.0325	0.0424	ND<0.0316	0.125	0.248	0.254	0.807 D
Aroclor 1262	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1268	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Total PCBs	1	ND<0.0325	0.0424	ND<0.0316	0.379	0.248	**1.25**	**3.7 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	SS-28-N10-3' 10/18/2016 3'	SS-28-N20-3" 10/18/2016 3"	SS-28-N20-2' 10/18/2016 2'	SS-28-S10-3" 10/18/2016 3"	SS-28-S10-1' 10/18/2016 1'	SS-28-S10-2' 10/18/2016 2'	SS-28-S20-1' 10/18/2016 1'
PCBs (mg/kg)								
Aroclor 1016	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1221	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1232	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1242	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1248	NE	0.232	0.228	ND<0.0279	0.476	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1254	NE	ND<0.0271	ND<0.03	0.598	ND<0.0305	ND<0.0312	ND<0.0251	0.0973
Aroclor 1260	NE	0.117	0.216	0.233	0.107	1	ND<0.0251	0.0909
Aroclor 1262	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1268	NE	ND<0.0271	ND<0.03	0.141	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Total PCBs	1	0.348	0.444	0.971	0.583	1	ND<0.0251	0.188

Notes:
D = Result is from an analysis that required a dilution
ND = Non-detect
NE = Not established

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria

Table 4B
October 2016 to 2017 SS-31 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31 7/27/2016 3"	SS-31-1' 10/18/2016 1'	SS-31-2' 10/18/2016 2'	SS-31-W10-3" 10/18/2016 3"	SS-31-W10-2' 10/18/2016 2'	SS-31-W20-3" 10/18/2016 3"	SS-31-W20-2' 10/18/2016 2'	SS-31-E10-3" 10/18/2016 3"	SS-31-E10-2' 10/18/2016 2'	SS-31-E20-3" 10/18/2016 3"	SS-31-E20-2' 10/18/2016 2'	SS-31-E20-4' 10/18/2016 4'	SS-31-E20N10-3" 11/30/2016 3"	SS-31-E20N10-2' 11/30/2016 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1221	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1232	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1242	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1248	NE	NE	NE	0.775	5.39 D	ND<0.0309	0.823	ND<0.0272	0.149	ND<0.0266	4.42 D	ND<0.0304	ND<0.0308	4.72 D	ND<0.0267	ND<0.0347	0.261
Aroclor 1254	NE	NE	NE	ND<0.0322	ND<0.615	0.26	ND<0.03	ND<0.0272	ND<0.0296	0.144	ND<0.309	0.181	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1260	NE	NE	NE	0.191	1.21 D	0.134	ND<0.03	0.116	0.101	0.0757	1.09 D	0.143	ND<0.0308	0.956 D	ND<0.0267	ND<0.0347	0.176
Aroclor 1262	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	0.173	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1268	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Total PCBs	1	15	50	0.965	**6.6 D**	0.394	0.996	0.116	0.25	0.22	**5.51 D**	0.325	ND<0.0308	**5.68 D**	ND<0.0267	ND<0.0347	0.437

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-E20S10-3" 11/30/2016 3"	SS-31-E20S10-2' 11/30/2016 2'	SS-31-E20S10-3.5' 11/30/2016 3.5'	SS-31-E30-3" 11/30/2016 3"	SS-31-E30-2' 11/30/2016 2'	SS-31-N10-3" 10/18/2016 3"	SS-31-N10-2' 10/18/2016 2'	SS-31-N10-3' 10/18/2016 3'	SS-31-N20-3" 10/18/2016 3"	SS-31-N20-2' 10/18/2016 2'	SS-31-N20-4' 10/18/2016 4'	SS-31-N20W10-3" 11/30/2016 3"	SS-31-N20W10-2' 11/30/2016 2'	SS-31-N20E10-3" 11/30/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1221	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1232	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1242	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1248	NE	NE	NE	0.138	6.54 D	ND<0.028	ND<0.0352	ND<0.0354	1.98 D	1.31	ND<0.0253	0.443	1.4	ND<0.0251	0.108	0.311	0.0691
Aroclor 1254	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1260	NE	NE	NE	ND<0.0316	1.23 D	ND<0.028	ND<0.0352	ND<0.0354	0.202 D	0.498	ND<0.0253	ND<0.0308	0.192	ND<0.0251	ND<0.0356	0.107	0.0462
Aroclor 1262	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1268	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Total PCBs	1	15	50	0.138	**7.77 D**	ND<0.028	ND<0.0352	ND<0.0354	**2.18 D**	**1.81**	ND<0.0253	0.443	**1.59**	ND<0.0251	0.108	0.418	0.115

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-N20E10-2' 11/30/2016 2'	SS-31-N30-3" 11/30/2016 3"	SS-31-N30-2' 11/30/2016 2'	SS-31-N30-3' 11/30/2016 3'	SS-31-N40-2' 11/30/2016 2'	SS-31-N40-3' 11/30/2016 3'	SS-31-N40-4' 11/30/2016 4'	SS-31-S10-3" 10/18/2016 3"	SS-31-S10-2' 10/18/2016 2'	SS-31-S20-3" 10/18/2016 3"	SS-31-S20-2' 10/18/2016 2'	SS-31-S20-3' 10/18/2016 3'	SS-31-S20W10-3" 11/30/2016 3"	SS-31-S20W10-2' 11/30/2016 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1221	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1232	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1242	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1248	NE	NE	NE	0.0557	ND<0.0347	69.6 D	0.163	7.06 D	ND<0.0326	0.084 HT-PCB	7.93 D	ND<0.0268	0.986	ND<0.0292	ND<0.0266	ND<0.0338	0.449
Aroclor 1254	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	0.827	ND<0.0272	ND<0.61	ND<0.0268	0.951	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1260	NE	NE	NE	0.0847	ND<0.0347	8.85 D	ND<0.0307	0.611 D	0.199	ND<0.0272	0.871 D	0.0677	0.23	0.281	ND<0.0266	ND<0.0338	0.281
Aroclor 1262	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	0.192	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1268	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Total PCBs	1	15	50	0.14	ND<0.0347	**78.5 D**	0.163	**7.67 D**	**1.22**	0.084 HT-PCB	**8.8 D**	0.0677	**1.22**	**1.23**	ND<0.0266	ND<0.0338	0.73

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-S20E10-3" 11/30/2016 3"	SS-31-S20E10-2' 11/30/2016 2'	SS-31-S25E30-3" 11/30/2016 3"	SS-31-S25E30-2' 11/30/2016 2'	SS-31-S25E30-3' 11/30/2016 3'	SS-31-S30-3" 11/30/2016 3"	DUP (SS-31-S30-3") 11/30/2016 3"	SS-31-S30-2' 11/30/2016 2'	LB-31-S25E30-SO1 (2') 6/8/2017 2'	LB-31-S25E30-SO3 (2') 6/8/2017 2'	LB-31-S25E30-SO5 (2') 6/8/2017 2'	LB-31-N30-SO2 (2') 6/8/2017 2'	LB-31-N30-SO2 (3') 10/24/2017 3'	LB-31-N30-SO2 (4') 10/24/2017 4'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1221	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1232	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1242	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1248	NE	NE	NE	ND<0.0345	ND<0.0316	0.179	8.05 D	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	1.29	44.7 D	0.84
Aroclor 1254	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1260	NE	NE	NE	ND<0.0345	0.177	ND<0.034	1.3 D	ND<0.0286	ND<0.0332	ND<0.0329	0.179	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	9.15 D	0.175
Aroclor 1262	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1268	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Total PCBs	1	15	50	ND<0.0345	0.177	0.179	**9.35 D**	ND<0.0286	ND<0.0332	ND<0.0329	0.179	ND<0.0311	ND<0.031	ND<0.0268	**1.29**	**53.9 D**	**1.01**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-31-N30-SO2 (5') 10/24/2017 5'	LB-31-N30-S02 (7') 10/24/2017 7'	LB-31-N30-SO1 (2') 6/8/2017 2'	LB-31-N30-SO1 (4') 6/8/2017 4'	LB-31-N30-SO3 (2') 6/8/2017 2'	LB-31-N40-SO5 (2') 6/8/2017 2'	LB-31-N40-SO7 (2') 6/9/2017 2'	LB-31-N40-SO7 (3') 6/9/2017 3'	LB-31-N40-S7 (4') 10/24/2017 4'	LB-31-N40-S7 (6') 10/24/2017 6'	LB-31-N40-S7 (7') 10/24/2017 7'	LB-31-N40-SO8 (2') 6/9/2017 2'	LB-31-N40-SO8 (4') 6/9/2017 4'	2017.09_LB-31-N40-SO8 (5') 9/14/2017 5'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1221	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1232	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1242	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1248	NE	NE	NE	3.84 D, HT-04	7.840	1.29	ND<0.029	ND<0.0322	ND<0.0317	4.39 D	2.42 D	12.8 D	2.12 D	0.28 HT-04	81.6 D	ND<0.142	ND<0.026
Aroclor 1254	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	0.0834	ND<0.155	1.16 D	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	2.14 D	ND<0.026
Aroclor 1260	NE	NE	NE	ND<0.256	1.170	0.208	ND<0.029	ND<0.0322	ND<0.0317	0.531 D	ND<0.14	1.93 D	0.335 D	ND<0.0254	13.7 D	ND<0.142	ND<0.026
Aroclor 1262	NE	NE	NE	0.629 D, HT-04	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1268	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Total PCBs	1	15	50	**4.47 D, HT-04**	**9.01**	**1.5**	ND<0.029	ND<0.0322	0.0834	**4.92 D**	**3.58 D**	**14.8 D**	**2.45 D**	0.28 HT-04	**95.3 D**	**2.14 D**	ND<0.026

Notes:
D = Result is from an analysis that required a dilution
HT-PCB = This sample was extracted outside of the CTDEEP RCP or other State recommended holding time. The USEPA per SW-846 has issued a revision extending PCB hold time to 1 year or longer.
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
NE = Not established
TSCA = Toxic Substances Control Act

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard
Bold, highlighted, and in red indicate an exceedance of the TSCA Threshold for Hazardous Waste

Table 4B
October 2016 to 2017 SS-31 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-31-N40-SO9 (2') 6/9/2017 2'	LB-31-N40-SO9 (4') 6/9/2017 4'	2017.09_LB-31-N40-SO9 (5') 9/14/2017 5'	LB-31-N40-SO10 (3") 8/2/2017 3"	LB-31-N40-SO10 (2') 8/2/2017 2'	LB-31-N40-SO10 (4') 8/2/2017 4'	LB-31-N40-SO11 (2') 8/2/2017 2'	LB-31-N40-SO11 (4') 8/2/2017 4'	LB-31-N40-SO12 (2') 8/2/2017 2'	LB-31-N40-SO12 (4') 8/2/2017 4'	LB-31-N40-SO12 (5') 8/2/2017 5'	2017.09_LB-31-N40-SO12 (6') 9/14/2017 6'	LB-31-N40-SO14 (2') 8/2/2017 2'	LB-31-N40-SO14 (4') 8/2/2017 4'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1221	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1232	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1242	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1248	NE	NE	NE	6.62 D	3.07 D	ND<0.0265	1.44 D	0.227	0.0441	1.08	0.684	15.1 D	1.12	1.37	ND<0.0248	ND<0.0313	60.7 D
Aroclor 1254	NE	NE	NE	3.1 D	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	0.501	ND<0.0259	ND<0.0248	0.444	ND<2.97
Aroclor 1260	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	0.419 D	0.122	ND<0.267	ND<0.0255	0.217	2.06 D	ND<0.0272	0.376	ND<0.0248	0.192	10.2 D
Aroclor 1262	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1268	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Total PCBs	1	15	50	**9.71 D**	**3.07 D**	ND<0.0265	**1.86 D**	0.349	0.0441	**1.08**	0.901	**17.2 D**	**1.62**	**1.74**	ND<0.0248	0.637	**70.8 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-31-N40-SO14 (5') 8/2/2017 5'	2017.09_LB-31-N40-SO14 (6') 9/14/2017 6'	LB-31-N30-SO15 (2') 8/2/2017 2'	LB-31-N30-SO15 (4') 8/2/2017 4'	LB-31-N30-SO16 (2') 8/2/2017 2'	LB-31-N30-SO16 (4') 8/2/2017 4'	2017.09_LB-31-N30-SO16 (5') 9/14/2017 5'	LB-31-N30-SO17 (2') 8/2/2017 2'	LB-31-N30-SO17 (4') 8/2/2017 4'	LB-31-N30-SO18 (3") 8/2/2017 3"	LB-31-N30-SO18 (2') 8/2/2017 2'	LB-31-N30-SO18 (4') 8/2/2017 4'	2017.09_SS31_1A (3") 9/13/2017 3"	2017.09_SS31_1A (2') 9/13/2017 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1221	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1232	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1242	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1248	NE	NE	NE	76.3 D	0.408	3.73 D	0.384	4.85 D	0.767	ND<0.0251	6.36 D	0.407	ND<0.0267	0.587	0.137	ND<0.0305	ND<0.0302
Aroclor 1254	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	0.249	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	0.165
Aroclor 1260	NE	NE	NE	16.7 D	ND<0.0247	1 D	0.105	0.665 D	ND<0.0258	ND<0.0251	1.19 D	0.155	0.0778 D	0.242	ND<0.0264	ND<0.0305	0.0803
Aroclor 1262	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1268	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Total PCBs	1	15	50	**93 D**	0.408	**4.73 D**	0.489	**5.51 D**	**1.02**	ND<0.0251	**7.55 D**	0.561	0.0778 D	0.829	0.137	ND<0.0305	0.246

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	2017.09_SS31_1A (4') 9/13/2017 4'	2017.09_SS31_1A (5') 9/13/2017 5'	2017.09_SS31_2A (2') 9/13/2017 2'	2017.09_SS31_2A (4') 9/13/2017 4'	2017.09_SS31_2A (5') 9/13/2017 5'	2017.09_SS31_2B (3") 9/13/2017 3"	2017.09_SS31_2B (4') 9/13/2017 4'	2017.09_SS31_3A (3") 9/13/2017 3"	2017.09_SS31_3A (2') 9/13/2017 2'	2017.09_SS31_3A (4') 9/13/2017 4'	2017.09_SS31_4A (2') 9/13/2017 2'	2017.09_SS31_4A (4') 9/13/2017 4'	2017.09_SS31_4A (5') 9/13/2017 5'	2017.09_SS31_4B (3") 9/13/2017 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1221	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1232	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1242	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1248	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	21.5 D	ND<0.0243	ND<0.0305	0.18	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	3.79 D	0.302	ND<0.0269
Aroclor 1254	NE	NE	NE	0.409	ND<0.0272	0.162	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	0.229	0.126	0.585	ND<0.527	ND<0.0246	0.0517 HT-01
Aroclor 1260	NE	NE	NE	ND<0.031	ND<0.0272	0.0817	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	0.0577	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1262	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	2.73 D	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	0.0783	0.13	0.75 D	ND<0.0246	ND<0.0269
Aroclor 1268	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Total PCBs	1	15	50	0.409	ND<0.0272	0.243	**24.2 D**	ND<0.0243	ND<0.0305	0.18	ND<0.0261	0.287	0.204	0.714	**4.54 D**	0.302	0.0517 HT-01

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	2017.09_SS31_4B (4') 9/13/2017 4'	2017.09_SS31_5A (3") 9/13/2017 3"	2017.09_SS31_5A (2') 9/13/2017 2'	2017.09_SS31_6A (2') 9/13/2017 2'	2017.09_SS31_6A (4') 9/13/2017 4'	2017.09_SS31_6A (5') 9/13/2017 5'	2017.09_SS31_6B (3") 9/13/2017 3"	2017.09_SS31_6B (2') 9/13/2017 2'	2017.09_SS31_6B (4') 9/13/2017 4'	2017.09_SS31_6B (5') 9/13/2017 5'	2017.09_SS31_6C (2') 9/13/2017 2'	2017.09_SS31_6C (4') 9/13/2017 4'	SS-31-6C (6') 10/25/2017 6'	SS-31-6C (7') 10/25/2017 7'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1221	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1232	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1242	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1248	NE	NE	NE	0.111	ND<0.0277	0.707	20.7 D	ND<0.0265	ND<0.0266	ND<0.0288	1.37	0.937	ND<0.0282	ND<0.028	78.1 D	7.12 D	14.1 D
Aroclor 1254	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1260	NE	NE	NE	0.0321	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	0.377	0.118	ND<0.0282	ND<0.028	11.5 D	1.13 D	2.34 D
Aroclor 1262	NE	NE	NE	ND<0.0248	ND<0.0277	0.225	2.59 D	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1268	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Total PCBs	1	15	50	0.143	ND<0.0277	0.931	**23.3 D**	ND<0.0265	ND<0.0266	ND<0.0288	**1.75**	**1.06**	ND<0.0282	ND<0.028	**89.6 D**	**8.25 D**	**16.4 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-6C (8') 10/25/2017 8'	SS-31-6C (9') 10/25/2017 9'	2017.09_SS31_7A (3") 9/13/2017 3"	2017.09_SS31_7A (2') 9/13/2017 2'	2017.09_SS31_7B (2') 9/13/2017 2'	2017.09_SS31_7B (4') 9/13/2017 4'	SS-31-8A (3") 10/25/2017 3"	SS-31-8A (2') 10/25/2017 2'	SS-31-8A (4') 10/25/2017 4'	SS-31-9A (4') 10/25/2017 4'	SS-31-9A (5') 10/25/2017 5'	SS-31-10A (3") 10/25/2017 3"	SS-31-10A (4') 10/25/2017 4'
PCBs (mg/kg)																
Aroclor 1016	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1221	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1232	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1242	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1248	NE	NE	NE	23.4 D, HT-04	ND<0.239	ND<0.03	0.103	1.23	0.68 HT-01	ND<0.0309	0.201	0.0367 HT-04	1.92 D	0.237	ND<0.0293	0.539
Aroclor 1254	NE	NE	NE	ND*<1.33	0.0933	0.0679 HT-01	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1260	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	0.0397	0.274	0.213 HT-01	ND<0.0309	0.107	ND<0.0315	0.254 D	ND<0.0263	ND<0.0293	0.114
Aroclor 1262	NE	NE	NE	3.97 D, HT-04	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	0.0451	ND<0.0293	ND<0.0251
Aroclor 1268	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Total PCBs	1	15	50	**27.4 D, HT-04**	0.332	0.0679 HT-01	0.143	**1.5**	0.893 HT-01	ND<0.0309	0.308	0.0367 HT-04	**2.17 D**	0.282	ND<0.0293	0.652

Notes:
D = Result is from an analysis that required a dilution
HT-PCB = This sample was extracted outside of the CTDEEP RCP or other State recommended holding time. The USEPA per SW-846 has issued a revision extending PCB hold time to 1 year or longer.
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
NE = Not established
TSCA = Toxic Substances Control Act

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard
Bold, highlighted, and in red indicate an exceedance of the TSCA Threshold for Hazardous Waste

Table 4C
October 2016 to 2017 SS-37 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37 7/27/2016 3"	SS-37-1' 10/18/2016 1'	SS-DUP1 RE (SS-37-1') 10/18/2016 1'	SS-37-2' 10/18/2016 2'	SS-37-4' 10/18/2016 4'	SS-37-W10-3" 10/18/2016 3"	SS-37-W10-2' 10/18/2016 2'	SS-37-W20-3" 10/18/2016 3"	SS-37-W20-2' 10/18/2016 2'	SS-37-W20-4' 10/18/2016 4'	SS-37-W20N10-3" 11/29/2016 3"	SS-37-W20N10-2' 11/29/2016 2'	SS-37-W20N10-4' 11/29/2016 4'	SS-37-W20S10-3" 11/29/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1221	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1232	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1242	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1248	NE	NE	NE	4.19 D	174 D	113 D	6.98 D	0.333	10 D	0.303	1.64	112 D	ND<0.0255	ND<0.0312	10.5 D	0.113	0.0633
Aroclor 1254	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1260	NE	NE	NE	0.845 D	ND*<14.8	11.5 D	ND<0.285	0.113	1.39 D	0.0835	0.242	11.9 D	ND<0.0255	ND<0.0312	1.33 D	ND<0.0274	ND<0.0352
Aroclor 1262	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	5.73 D	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1268	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Total PCBs	1	15	50	**5.03 D**	**174 D**	**124 D**	**12.7 D**	0.446	**11.4 D**	0.386	**1.88**	**123 D**	ND<0.0255	ND<0.0312	**11.8 D**	0.113	0.0633

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-W20S10-2' 11/29/2016 2'	SS-37-W30-3" 11/29/2016 3"	SS-37-W30-2' 11/29/2016 2'	SS-37-E10-3" 10/18/2016 3"	SS-37-E10-2' 10/18/2016 2'	SS-37-E10-4' 10/18/2016 4'	SS-37-E20-3" 10/18/2016 3"	SS-37-E20-2' 11/30/2016 2'	SS-37-E20-3' 11/30/2016 3'	SS-37-E20-5' 11/30/2016 5'	SS-37-N10-3" 10/18/2016 3"	SS-37-N10-2' 10/18/2016 2'	SS-37-N10-4' 10/18/2016 4'	SS-37-N20-3" 10/18/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1221	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1232	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1242	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1248	NE	NE	NE	0.0881	ND<0.0328	0.591	0.172	1.58	ND<0.0257	1.26	0.879	2.7 D	ND<0.033	231 D	0.908	0.365	3.77 D
Aroclor 1254	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	1.43	0.246	ND<0.0356	ND<0.0348	ND<0.162	0.67	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1260	NE	NE	NE	ND<0.0305	ND<0.0328	0.174	0.121	ND<0.0304	0.151	0.175	0.123	0.261 D	0.189	19.7 D	0.208	0.112	0.614 D
Aroclor 1262	NE	NE	NE	0.17	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	0.181	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1268	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Total PCBs	1	15	50	0.258	ND<0.0328	0.765	0.293	**3.02**	0.397	**1.43**	1	**2.96 D**	**1.04**	**250 D**	**1.12**	0.477	**4.39 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-N20-2' 10/18/2016 2'	SS-37-N20-4' 10/18/2016 4'	SS-37-N20-5' 10/18/2016 5'	SS-37-N20-6' 11/30/2016 6'	SS-37-N20W10-3" 11/29/2016 3"	SS-37-N20W10-5' 11/29/2016 5'	SS-37-N20W20-2' 11/29/2016 2'	SS-37-N20W20-4' 11/29/2016 4'	SS-37-N20E10-3" 11/29/2016 3"	SS-37-N20E10-2' 11/29/2016 2'	SS-37-N20E10-5' 11/29/2016 5'	SS-37-N20E20-3" 11/29/2016 3"	SS-37-N20E20-2' 11/29/2016 2'	SS-37-N30-3" 11/29/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1221	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1232	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1242	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1248	NE	NE	NE	0.769	1.31	ND<0.14	0.336	ND<0.0332	8.56 D	ND<0.0322	1.45	0.326	0.0301	0.38	ND<0.0294	0.0801	
Aroclor 1254	NE	NE	NE	0.762	ND<0.0324	2.43 D	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1260	NE	NE	NE	0.248	0.205	0.547 D	0.251	ND<0.0332	0.112	0.682 D	0.0507	0.198	0.0939	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1262	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1268	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Total PCBs	1	15	50	**1.78**	**1.51**	**2.98 D**	0.587	ND<0.0332	0.82	**9.25 D**	0.0507	**1.65**	0.42	0.0301	0.38	ND<0.0294	0.0801

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-N30-5' 11/29/2016 5'	SS-37-N30-6' 11/29/2016 6'	SS-37-N40-3" 7/19/2017 3"	SS-37-N40-2' 7/19/2017 2'	SS-37-N40-4' 7/19/2017 4'	SS-37-N40-5' 11/29/2016 5'	SS-37-S10-3" 10/18/2016 3"	SS-37-S10-2' 10/18/2016 2'	SS-37-S20-3" 10/18/2016 3"	SS-37-S20-2' 10/18/2016 2'	SS-37-S20-4' 10/18/2016 4'	SS-37-S20W10-3" 11/29/2016 3"	SS-37-S20W10-2' 11/29/2016 2'	SS-37-S20E10-3" 11/29/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1221	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1232	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1242	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1248	NE	NE	NE	9.63 D	0.0426	0.0952	13.3 D	14.4 D	0.189	318 D	0.386	0.598	1.01	0.101	ND<0.0321	0.127	0.0563
Aroclor 1254	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	5.56 D	5.77 D	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	1.47	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1260	NE	NE	NE	1.54 D	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	0.0326	ND*<29.3	0.105	0.222	0.698	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1262	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	0.287	ND<0.0303
Aroclor 1268	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Total PCBs	1	15	50	**11.2 D**	0.0426	0.0952	**18.9 D**	**20.2 D**	0.222	**318 D**	0.491	0.821	**3.17**	0.101	ND<0.0321	0.414	0.0563

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-S20E10-2' 11/29/2016 2'	SS-37-S30-3" 11/29/2016 3"	SS-37-S30-2' 11/29/2016 2'	LB-37-N20W20-SO2 (2') 6/8/2017 2'	DUP-1_6.8.17 (LB-37-N20W20-SO2 (2')) 6/8/2017 2'	LB-37-N20W20-SO3 (2') 6/8/2017 2'	LB-37-N20W20-SO4 (3") 6/8/2017 3"	LB-37-N20W20-SO4 (2') 6/8/2017 2'	LB-37-N40-SO1 (2') 8/2/2017 2'	LB-37-N40-SO1 (3.5') 8/2/2017 3.5'	LB-37-N40-SO2 (1.5') 8/2/2017 1.5'	LB-37-N40-SO3 (2') 8/2/2017 2'	LB-37-N40-SO3 (4') 8/2/2017 4'	LB-37-N40-SO4 (2') 8/2/2017 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1221	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1232	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1242	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1248	NE	NE	NE	0.0946	0.0728	0.152	0.533	0.503	0.213	ND<0.0334	0.141	11.4 D	481 D	41 D	20.4 D	0.161	4.85 D
Aroclor 1254	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1260	NE	NE	NE	0.0668	ND<0.0349	0.117	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	2.41 D	62.5 D	3.24 D	5.33 D	ND<0.0258	ND<0.0258
Aroclor 1262	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	1.68 D
Aroclor 1268	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Total PCBs	1	15	50	0.161	0.0728	0.27	0.533	0.503	0.213	ND<0.0334	0.141	**13.8 D**	**543 D**	**44.2 D**	**25.8 D**	0.161	**6.53 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-37-N40-SO4 (4') 8/2/2017 4'	LB-37-N40-SO5 (2') 8/2/2017 2'	LB-37-N40-SO5 (4') 8/2/2017 4'	LB-37-N40-SO5 (5') 8/2/2017 5'	2017.09_LB-37-N40-SO5 (6') 9/14/2017 6'	2017.09_SS37_1A (2') 9/14/2017 2'	2017.09_SS37_1A (4') 9/14/2017 4'	2017.09_SS37_1A (5') 9/14/2017 5'	2017.09_SS37_1A (6') 9/14/2017 6'	2017.09_SS37_1B (4') 9/14/2017 4'	2017.09_SS37_1B (5') 9/14/2017 5'	2017.09_SS37_2A (2') 9/14/2017 2'	2017.09_SS37_2A (4') 9/14/2017 4'	2017.09_SS37_2A (5') 9/14/2017 5'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1221	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1232	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1242	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1248	NE	NE	NE	0.196	0.154 HT-01	2.49 D, HT-01	6.51 D	ND<0.0441	0.582	0.959	3.41 D	ND<0.0332	1.14	ND<0.0254	1.96 D	14.1 D	0.349
Aroclor 1254	NE	NE	NE	0.24	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1260	NE	NE	NE	ND<0.0299	ND<0.0277	1.04 D, HT-01	1.11 D	ND<0.0441	0.0735	0.305	0.664 D	ND<0.0332	0.25	ND<0.0254	ND<0.147	2.27 D	0.046
Aroclor 1262	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1268	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Total PCBs	1	15	50	0.436	0.154	**3.52 D**	**7.62 D**	ND<0.0441	0.656	**1.26**	**4.07 D**	ND<0.0332	**1.39**	ND<0.0254	**1.96 D**	**16.4 D**	0.395

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	2017.09_SS37_2B (2') 9/14/2017 2'	2017.09_SS37_2B (4') 9/14/2017 4'	2017.09_SS37_3A (2') 9/14/2017 2'	2017.09_SS37_3A (4') 9/14/2017 4'	2017.09_SS37_3B (2') 9/14/2017 2'	2017.09_SS37_3B (4') 9/14/2017 4'	2017.09_SS37_3B (5') 9/14/2017 5'	2017.09_SS37_4A (2') 9/14/2017 2'	2017.09_SS37_4A (4') 9/14/2017 4'	2017.09_SS37_4B (2') 9/14/2017 2'	2017.09_SS37_4B (3'10") 9/14/2017 3'10"	SS-38-1A (8'-10') 10/24/2017 8'-10'
PCBs (mg/kg)															
Aroclor 1016	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1221	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1232	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1242	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1248	NE	NE	NE	1.15	0.399 HT-01	3.85 D	ND<0.0262	1.13	6.08 HT-01, D	0.189 HT-04	0.907	ND<0.0249	2.8 D	ND<0.0256	ND<0.0286
Aroclor 1254	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1260	NE	NE	NE	0.371	0.201 HT-01	ND<0.292	ND<0.0262	0.162	1.66 HT-01, D	ND<0.0249	0.162	ND<0.0249	0.536 D	ND<0.0256	ND<0.0286
Aroclor 1262	NE	NE	NE	ND<0.0283	ND<0.0275	8.09 D	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1268	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Total PCBs	1	15	50	**1.52**	0.6 HT-01	**11.9 D**	ND<0.0262	**1.3**	**7.74 HT-01, D**	0.189 HT-04	**1.07**	ND<0.0249	**3.34 D**	ND<0.0256	ND<0.0286

Notes:
D = Result is from an analysis that required a dilution
HT-01 = This result was reported from an analysis conducted outside of the EPA recommended holding time.
HT-04 = NON-COMPLIANT - Client requested analysis be conducted outside of holding times.
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
NE = Not established
TSCA = Toxic Substances Control Act

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard
Bold, highlighted, and in red indicate an exceedance of the TSCA Threshold for Hazardous Waste

Table 5
June 2017 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-39 (3") 6/9/2017 3"	SS-39 (1') 6/9/2017 1'	SS-40 (3") 6/9/2017 3"	SS-40 (1') 6/9/2017 1'	SS-41 (3") 6/9/2017 3"	SS-41 (1') 6/9/2017 1'	SS-42 (3") 6/9/2017 3"	SS-42 (1') 6/9/2017 1'	SS-43 (3") 6/9/2017 3"	SS-43 (1') 6/9/2017 1'	SS-44 (3") 6/9/2017 3"	SS-44 (1') 6/9/2017 1'	SS-45 (3") 6/9/2017 3"	SS-45 (1') 6/9/2017 1'	SS-46 (3") 6/9/2017 3"	SS-46 (1') 6/9/2017 1'	SS-47 (3") 6/9/2017 3"	SS-47 (1') 6/9/2017 1'	SS-48 (3") 6/9/2017 3"	SS-48 (1') 6/9/2017 1'	SS-49 (3") 6/9/2017 3"	SS-49 (6") 6/9/2017 6"	SS-49 (1') 6/9/2017 1'	SS-50 (3") 6/9/2017 3"	SS-50 (6") 6/9/2017 6 "
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1221	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1232	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1242	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1248	NE	NE	ND<0.0322	ND<0.0307	0.0667	0.38 HT-04	ND<0.0319	0.0361 HT-04	ND<0.0375	ND<0.0296	ND<0.0339	3.06 HT-04, D	0.0348	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	0.391 HT-04	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1254	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1260	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	0.181 HT-04	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	0.561 HT-04, D	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	0.174 HT-04	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1262	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1268	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Total PCBs	1	15	ND<0.0322	ND<0.0307	0.0667	0.561 HT-04	ND<0.0319	0.0361 HT-04	ND<0.0375	ND<0.0296	ND<0.0339	**3.62 HT-04, D**	0.0348	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	0.565 HT-04	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-50 (1') 6/9/2017 1'	SS-51 (3") 6/9/2017 3"	SS-51 (6") 6/9/2017 6 "	SS-51 (1') 6/9/2017 1'	SS-52 (3") 6/9/2017 3"	SS-52 (6") 6/9/2017 6 "	SS-52 (1') 6/9/2017 1'	SS-53 (3") 6/9/2017 3"	SS-53 (6") 6/9/2017 6"	SS-53 (1') 6/9/2017 1'	SS-54 (3") 6/9/2017 3"	SS-54 (1') 6/9/2017 1'	SS-55 (3") 6/9/2017 3"	SS-55 (6") 6/9/2017 6"	SS-55 (1') 6/9/2017 1'	SS-56 (3") 6/9/2017 3"	SS-56 (6") 6/9/2017 6"	SS-56 (1') 6/9/2017 1'	SS-57 (3") 6/9/2017 3"	SS-57 (1') 6/9/2017 1'	SS-58 (3") 6/9/2017 3"	SS-58 (1') 6/9/2017 1'	SS-59 (3") 6/9/2017 3"	SS-59 (1') 6/9/2017 1'	SS-60 (3") 6/9/2017 3"
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1221	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1232	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1242	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1248	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	1.26 HT-04	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1254	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	0.14 HT-04	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1260	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	0.0595 HT-04	ND<0.0305	0.287 HT-04	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1262	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1268	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Total PCBs	1	15	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	0.2 HT-04	ND<0.0305	**1.54 HT-04**	ND<0.0357	ND<0.03	ND<0.0302

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-60 (1') 6/9/2017 1'	SS-61 (3") 6/9/2017 3"	SS-61 (1') 6/9/2017 1'	SS-62 (3") 6/9/2017 3"	SS-62 (1') 6/9/2017 1'	SS-63 (3") 6/9/2017 3"	SS-63 (6") 6/9/2017 6"	SS-63 (1') 6/9/2017 1'	SS-64 (3") 6/9/2017 3"	SS-64 (1') 6/9/2017 1'	SS-65 (3") 6/9/2017 3"	SS-65 (1') 6/9/2017 1'	SS-66 (3") 6/9/2017 3"	SS-66 (1') 6/9/2017 1'	SS-67 (3") 6/9/2017 3"	SS-67 (1') 6/9/2017 1'	SS-68 (3") 6/9/2017 3"	SS-68 (1') 6/9/2017 1'	SS-69 (3") 6/9/2017 3"	DUP-4_6.9.17 (SS-69 (3")) 6/9/2017 3"	SS-69 (1') 6/9/2017 1'	SS-70 (3") 6/9/2017 3"	SS-70 (1') 6/9/2017 1'	SS-71 (3") 6/9/2017 3"	SS-71 (1') 6/9/2017 1'
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1221	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1232	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1242	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1248	NE	NE	0.0525 HT-04	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	0.509	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1254	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	0.329 HT-04	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1260	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	0.114	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	0.0473 HT-01	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	0.0532 HT-04
Aroclor 1262	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	0.271 HT-04	ND<0.0302	0.2 HT-04	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1268	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Total PCBs	1	15	0.0525 HT-04	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	0.623	ND<0.0311	0.271 HT-04	ND<0.0302	0.529 HT-04	ND<0.029	ND<0.0282	ND<0.0338	0.0473 HT-01	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	0.0532 HT-04

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-72 (3") 6/9/2017 3"	SS-72 (1') 6/9/2017 1'	SS-73 (3") 6/9/2017 3"	SS-73 (1') 6/9/2017 1'	SS-74 (3") 6/9/2017 3"	SS-74 (1') 6/9/2017 1'	SS-75 (3") 6/9/2017 3"	SS-75 (1') 6/9/2017 1'	SS-76 (3") 6/9/2017 3"	SS-76 (1') 6/9/2017 1'	SS-77 (3") 6/9/2017 3"	SS-77 (1') 6/9/2017 1'	SS-78 (3") 6/9/2017 3"	SS-78 (1') 6/9/2017 1'	SS-79 (3") 6/9/2017 3"	SS-79 (1') 6/9/2017 1'	SS-80 (3") 6/9/2017 3"	SS-80 (1') 6/9/2017 1'	SS-81 (3") 6/9/2017 3"	SS-81 (1') 6/9/2017 1'	SS-82 (3") 6/9/2017 3"	SS-82 (1') 6/9/2017 1'	SS-83 (3") 6/9/2017 3"	SS-83 (1') 6/9/2017 1'	SS-84 (3") 6/9/2017 3"
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1221	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1232	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1242	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1248	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	0.0481	0.315 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	1.11 HT-04	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1254	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	0.134 HT-04	ND<0.0335	0.232 HT-04	ND<0.0311	0.271 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	0.508 HT-04	ND<0.029	0.165 HT-04	ND<0.0305	1.47 HT-04	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1260	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1262	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	0.0629 HT-04	ND<0.0335	0.0742 HT-04	ND<0.0311	0.0785 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	0.191 HT-04	ND<0.029	0.122 HT-04	ND<0.0305	0.777 HT-04	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1268	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Total PCBs	1	15	ND<0.0349	ND<0.0295	ND<0.0339	0.197 HT-04	ND<0.0335	0.306 HT-04	0.0481	0.664 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	0.699 HT-04	ND<0.029	0.286 HT-04	ND<0.0305	**3.35 HT-04**	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	DUP-2_6.9.17 (SS-84 (3")) 6/9/2017 3"	SS-84 (1') 6/9/2017 1'	SS-85 (3") 6/9/2017 3"	SS-85 (1') 6/9/2017 1'	SS-86 (3") 6/9/2017 3"	SS-86 (1') 6/9/2017 1'	SS-87 (3") 6/9/2017 3"	SS-87 (1') 6/9/2017 1'	SS-88 (3") 6/9/2017 3"	SS-88 (1') 6/9/2017 1'	SS-89 (3") 6/9/2017 3"	SS-89 (1') 6/9/2017 1'	SS-90 (3") 6/9/2017 3"	SS-90 (1') 6/9/2017 1'	SS-91 (3") 6/9/2017 3"	SS-91 (1') 6/9/2017 1'	SS-92 (3") 6/9/2017 3"	SS-92 (1') 6/9/2017 1'	SS-93 (3") 6/9/2017 3"	SS-93 (1') 6/9/2017 1'	SS-94 (3") 6/9/2017 3"	SS-94 (1') 6/9/2017 1'	SS-95 (3") 6/9/2017 3"	SS-95 (1') 6/9/2017 1'	SS-96 (3") 6/9/2017 3"
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1221	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1232	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1242	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1248	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	1.03 HT-04	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	0.466 HT-04	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1254	NE	NE	ND<0.0345	0.202 HT-04	ND<0.0299	0.517 HT-04	ND<0.0355	0.942 HT-04	ND<0.0306	0.468 HT-04	ND<0.0318	0.16 HT-01	ND<0.0327	ND<0.0298	ND<0.0268	0.54 HT-01	ND<0.0358	0.125 HT-04	ND<0.0295	0.187 HT-04	ND<0.0299	ND<0.0306	ND<0.0361	0.553 HT-04	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1260	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1262	NE	NE	ND<0.0345	0.174 HT-04	ND<0.0299	0.193 HT-04	ND<0.0355	0.552 HT-04	ND<0.0306	0.226 HT-04	ND<0.0318	0.0694 HT-01	ND<0.0327	ND<0.0298	ND<0.0268	0.226 HT-01	ND<0.0358	ND<0.0308	ND<0.0295	0.201 HT-04	ND<0.0299	ND<0.0306	ND<0.0361	0.374 HT-04	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1268	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Total PCBs	1	15	ND<0.0345	0.376 HT-04	ND<0.0299	0.71 HT-04	ND<0.0355	**2.52 HT-04**	ND<0.0306	0.693 HT-04	ND<0.0318	0.229 HT-01	ND<0.0327	ND<0.0298	ND<0.0268	0.766 HT-01	ND<0.0358	0.59 HT-04	ND<0.0295	0.388 HT-04	ND<0.0299	ND<0.0306	ND<0.0361	0.927 HT-04	ND<0.035	ND<0.031	ND<0.0291

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-96 (1') 6/9/2017 1'	SS-97 (3") 6/9/2017 3"	SS-97 (6") 6/9/2017 6"	SS-97 (1') 6/9/2017 1'	SS-98 (3") 6/9/2017 3"	SS-98 (6") 6/9/2017 6"	SS-98 (1') 6/9/2017 1'	SS-99 (3") 6/9/2017 3"	SS-99 (6") 6/9/2017 6"	SS-99 (1') 6/9/2017 1'	SS-100 (3") 6/9/2017 3"	SS-100 (6") 6/9/2017 6"	SS-100 (1') 6/9/2017 1'	SS-101 (3") 6/9/2017 3"	SS-101 (6") 6/9/2017 6"	SS-101 (1') 6/9/2017 1'	SS-102 (3") 6/9/2017 3"	SS-102 (6") 6/9/2017 6"	SS-102 (1') 6/9/2017 1'	SS-103 (3") 6/9/2017 3"	SS-103 (6") 6/9/2017 6"	SS-103 (1') 6/9/2017 1'	SS-104 (3") 6/9/2017 3"	SS-104 (1') 6/9/2017 1'	SS-105 (3") 6/9/2017 3"	DUP-3_6.9.17 (SS-105 (3")) 6/9/2017 3"	SS-105 (1') 6/9/2017 1'
PCBs (mg/kg)																													
Aroclor 1016	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1221	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1232	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1242	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1248	NE	NE	12.4 D, HT-04	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	0.584	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	0.815	ND<0.0264	ND<0.0285	2.26 D, HT-04	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	1.29 HT-04
Aroclor 1254	NE	NE	6.6 D, HT-04	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	2.72 D, HT-04	ND<0.0318	1.24 HT-04	ND<0.0288	ND<0.0272	1.05 HT-04
Aroclor 1260	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	0.0956	ND<0.0281	ND<0.0305	0.0336	ND<0.027	0.0415	0.0383	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1262	NE	NE	2.76 D, HT-04	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	2.13 D, HT-04	ND<0.0318	0.67 HT-04	ND<0.0288	ND<0.0272	0.263 HT-04
Aroclor 1268	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Total PCBs	1	15	**21.7 D, HT-04**	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	0.584	ND<0.0268	ND<0.0289	0.0956	ND<0.0281	ND<0.0305	0.0336	ND<0.027	0.0415	0.0383	ND<0.0269	ND<0.0297	0.815	ND<0.0264	ND<0.0285	**7.1 D, HT-04**	ND<0.0318	**1.91 HT-04**	ND<0.0288	ND<0.0272	**2.61 HT-04**

Notes:
D = Result is from an analysis that required a dilution.
HT-01 = This result was reported from an analysis conducted outside of the EPA recommended holding time.
HT-04 = NON-COMPLIANT - Client requested analysis be conducted outside of holding times.
ND = Non-detect
NE = Not established

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard

Table 6A
October 2018 Soil Boring Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Depth (feet)/Parent Sample Sampling Date Sample Matrix	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-11_1-2 1-2 10/15/2018 Soil		SS-32_1-2 1-2 10/16/2018 Soil		SS-32_2-3 2-3 10/16/2018 Soil		SS-32_3-4 3-4 10/16/2018 Soil		SS-32_4-5 4-5 10/16/2018 Soil		SS-36_1-2 1-2 10/15/2018 Soil		SS-36_2-3 2-3 10/15/2018 Soil		SS-36_3-4 3-4 10/15/2018 Soil		SS-36_4-5 4-5 10/15/2018 Soil		SS-36_5-6 5-6 10/15/2018 Soil		SS-36_6-7 6-7 10/15/2018 Soil		SS-36_7-8 7-8 10/15/2018 Soil		SS-43_1-2 1-2 10/15/2018 Soil		SS-58_1-2 1-2 10/16/2018 Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds (VOCs)	mg/kg	mg/kg																													
1,2-Dibromoethane	0.007	0.1	NT		*0.0071*	U	NT		NT		NT		*0.0073*	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Acetone	500	140	NT		0.014	U	NT		NT		NT		0.015	U	NT		NT		NT		NT		NT		NT		NT		NT		0.01	U
cis-1,2-Dichloroethylene	~	~	NT		0.02		NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Tetrachloroethylene	12	1	NT		0.028		NT		NT		NT		0.033		NT		NT		NT		NT		NT		NT		NT		NT		0.16	
Toluene	500	67	NT		0.0071	U	NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
trans-1,2-Dichloroethylene	~	20	NT		0.0084		NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Trichloroethylene	56	1	NT		**3.7**	D	NT		NT		NT		0.086		NT		NT		NT		NT		NT		NT		NT		NT		0.13	
Vinyl Chloride	0.32	0.4	NT		0.0071	U	NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Semi-Volatile Organic Compounds (SVOCs)	mg/kg	mg/kg																													
Acenaphthene	1,000*	84*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Anthracene	1000	400	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Benzo(a)anthracene	1	1	NT		0.79	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.5**	D
Benzo(a)pyrene	1	1	NT		0.789	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.54**	D
Benzo(b)fluoranthene	1	1	NT		0.7	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.23**	D
Benzo(g,h,i)perylene	8.4*	1*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.907	D
Benzo(k)fluoranthene	8.4	1	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.21**	D
Carbazole	31*	1*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Chrysene	84*	1*	NT		0.749	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.35**	D
Dibenzofuran	68*	1.4*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Fluoranthene	1000	56	NT		1.24	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		2.56	D
Fluorene	1000	56	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Indeno(1,2,3-cd)pyrene	1*	1*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.836	D
Phenanthrene	1000	40	NT		0.789	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		1.08	D
Pyrene	1000	40	NT		1.14	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		2.25	D
Pesticides	mg/kg	mg/kg																													
4,4'-DDD	1.8*	0.02*	NT		0.00315	U	NT		NT		NT		**0.112**	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
4,4'-DDT	1.8*	0.02*	NT		0.00315	U	NT		NT		NT		**0.16**	D	NT		**0.0447**		0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Alachlor	7.7	0.4	NT		0.00315	U	NT		NT		NT		0.122	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Aldrin	0.04*	0.01*	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	02AB152:BK152	U	NT		0.00335	U
beta-BHC	~	~	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Chlordane, total	0.49*	0.066*	NT		0.0629	U	NT		NT		NT		**0.514**	D	**0.0833**		0.0126	U	0.0551	U	0.0518	U	0.0525	U	0.0537	U	NT		*0.0669*	U
delta-BHC	~	~	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Dieldrin	0.038	0.007	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		**0.21**	D
Endrin	20*	0.4*	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Endrin aldehyde	20*	0.4*	NT		0.00315	U	NT		NT		NT		0.0571	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Endrin ketone	20*	0.4*	NT		0.00315	U	NT		NT		NT		0.135	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
gamma-BHC (Lindane)	20	0.04	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Heptachlor epoxide	0.067	0.02	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Herbicides	Varies	Varies	NT		ND		NT		NT		NT		ND		NT		NT		NT		NT		NT		NT		NT		ND	
Extractable Total Petroleum Hydrocarbons (ETPH)	mg/kg	mg/kg																												
ETPH (Extractable Total Petroleum Hydrocarbons)	500	2500	NT		389		NT		NT		NT		195		NT		NT		NT		NT		NT		NT		NT		247	
Metals	mg/kg	mg/L			mg/kg								mg/kg																mg/kg	
Antimony	27	~	NT		12.9		NT		10.2		2.67	U	9.46		NT		3.16	U	2.75	U	2.61	U	2.62	U	2.69	U	NT		11.9	
Arsenic	10	~	NT		23.2		43.6		15.9		3.81		20		12.5		8.47		6.59		4.8		5.22		5.34		NT		26	
Barium	4700	~	NT		1880		NT		1170		513		1410		NT		1570		486		431		415		441		NT		1500	
Cadmium	34	~	NT		10.9		NT		9.9		0.747		11.9		NT		7.88		2.21		0.744		0.739		1.02		NT		28.7	
Chromium	4000	~	NT		251		NT		200		185		161		NT		95.5		125		137		143		131		NT		251	
Copper	2500	~	NT		1040		NT		636		51.2		1390		NT		603		204		37.8		45.9		72.2		NT		2180	
Lead	400	~	NT		3640		22900		2290		39.3		3260		1380		3590		391		23.9		32.8		90.6		NT		4970	
Mercury	20	~	NT		1.83		NT		0.719		0.032	U	0.929		NT		1.03		0.292		0.0313	U	0.0315	U	0.0582		NT		0.994	
Nickel	1400	~	NT		159		NT		156		90		145		NT		107		71.8		68.9		78.4		65.7		NT		357	
Silver	340	~	NT		3.9		NT		11.4		0.533	U	2.38		NT		5.05		0.551	U	0.521	U	0.525	U	0.537	U	NT		2.46	
Vanadium	470	~	NT		133		NT		486		91.1		126		NT		74		76.5		86.1		88.4		80.7		NT		174	
Zinc	20000	~	NT		2420		NT		3920	D	101		2540		NT		1870		483		83.4		83.3		122		NT		3330	
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																												
Aroclor 1248	~	~	0.0335	U	3.15	U	36	D	0.0297	U	1.2		0.0335	U	0.0287	U	NT		NT		NT		NT		NT		0.0321	U	0.167	U
Aroclor 1254	~	~	0.243		151	D	1.6	U	1.26		0.0267	U	0.471		0.0287	U	NT		NT		NT		NT		NT		0.389		4.8	D
Aroclor 1260	~	~	0.125		3.15	U	1.6	U	0.338		0.156		0.545		0.0609		NT		NT		NT		NT		NT		0.17		0.167	U
Aroclor 1262	~	~	0.0335	U	20.4	D	3.94	D	0.0297	U	0.0267	U	0.0335	U	0.0287	U	NT		NT		NT		NT		NT		0.0321	U	0.167	U
Aroclor 1268	~	~	0.0335	U	3.15	U	1.6	U	0.0297	U	0.0267	U	0.0335	U	0.0287	U	NT		NT		NT		NT		NT		0.0321	U	3.92	D
Total PCBs	1	~	0.368		172	D	40	D	1.6		1.35	1	1.02		0.0609		NT		NT		NT		NT		NT		0.559		8.72	D

NOTES:
Only analytes with detections are shown in table
~ = Indicates no regulatory limit has been established for this analyte
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Bold indicates an exceedance of the Pollutant Mobility Criteria
Shaded indicates an exceedance of the Residential Direct Exposure Criteria
Italics indicates laboratory reporting limits above CTDEEP criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 17 April 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 6A
October 2018 Soil Boring Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Depth (feet)/Parent Sample Sampling Date Sample Matrix	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-58_2-3 2-3 10/16/2018 Soil		SS-61_1-2 1-2 10/16/2018 Soil		SS-61_2-3 2-3 10/16/2018 Soil		SS-61_3-4 3-4 10/16/2018 Soil		SS-61_4-5 4-5 10/16/2018 Soil		SS-81_1-2 1-2 10/16/2018 Soil		SS-81_2-3 2-3 10/16/2018 Soil		SS-81_3-4 3-4 10/16/2018 Soil		SS-86_1-2 1-2 10/15/2018 Soil		SS-86_2-2.5 2-2.5 10/15/2018 Soil		SS-86_2.5-3 2.5-3 10/15/2018 Soil		SS-95_1-2 1-2 10/16/2018 Soil		SS-96_1-2 1-2 10/16/2018 Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds (VOCs)	mg/kg	mg/kg																											
1,2-Dibromoethane	0.007	0.1	NT		0.0049	U	NT		NT		NT		0.0058	U	NT		NT		*0.73*	U	NT		NT		NT		NT	
Acetone	500	140	NT		0.0099	U	NT		NT		NT		0.03		NT		NT		1.5	U	NT		NT		NT		NT	
cis-1,2-Dichloroethylene	~	~	NT		0.0049	U	NT		NT		NT		0.14		NT		NT		6.5	D	NT		NT		NT		NT	
Tetrachloroethylene	12	1	NT		0.0049	U	NT		NT		NT		0.14		NT		NT		**2.7**	D	NT		NT		NT		NT	
Toluene	500	67	NT		0.0049	U	NT		NT		NT		0.01		NT		NT		0.73	U	NT		NT		NT		NT	
trans-1,2-Dichloroethylene	~	20	NT		0.0049	U	NT		NT		NT		0.079		NT		NT		7.1	D	NT		NT		NT		NT	
Trichloroethylene	56	1	NT		0.025		NT		NT		NT		**7.5**	D	NT		NT		**53**	D	NT		NT		NT		NT	
Vinyl Chloride	0.32	0.4	NT		0.0049	U	NT		NT		NT		0.1		NT		NT		*0.73*	U	NT		NT		NT		NT	
Semi-Volatile Organic Compounds (SVOCs)	mg/kg	mg/kg																											
Acenaphthene	1,000*	84*	2.24	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Anthracene	1000	400	8.69	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Benzo(a)anthracene	1	1	**25.6**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.814	D	NT		NT		NT		NT	
Benzo(a)pyrene	1	1	**24**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.775	D	NT		NT		NT		NT	
Benzo(b)fluoranthene	1	1	**18.8**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.728	D	NT		NT		NT		NT	
Benzo(g,h,i)perylene	8.4*	1*	**12.4**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Benzo(k)fluoranthene	8.4	1	**20.8**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Carbazole	31*	1*	**1.13**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Chrysene	84*	1*	**23.5**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.717	D	NT		NT		NT		NT	
Dibenzofuran	68*	1.4*	0.731	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Fluoranthene	1000	56	51.8	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		1.31	D	NT		NT		NT		NT	
Fluorene	1000	56	2.17	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Indeno(1,2,3-cd)pyrene	1*	1*	**14.1**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Phenanthrene	1000	40	21.6	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Pyrene	1000	40	**52.2**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		1.28	D	NT		NT		NT		NT	
Pesticides	mg/kg	mg/kg																											
4,4'-DDD	1.8*	0.02*	NT		0.00299	U	NT		NT		NT		0.00335	U	NT		NT		**0.0985**	D	NT		NT		NT		NT	
4,4'-DDT	1.8*	0.02*	NT		**0.0233**	D	NT		NT		NT		0.00335	U	NT		NT		**0.0246**	D	NT		NT		NT		NT	
Alachlor	7.7	0.4	NT		0.0942	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Aldrin	0.04*	0.01*	NT		**0.0311**	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
beta-BHC	~	~	NT		0.00299	U	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Chlordane, total	0.49*	0.066*	NT		0.0599	U	NT		NT		NT		*0.0671*	U	NT		NT		*0.0693*	U	NT		NT		NT		NT	
delta-BHC	~	~	NT		0.00609	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Dieldrin	0.038	0.007	0.000612	U	**0.0107**	D	NT		NT		NT		0.00335	U	NT		NT		**0.00916**	D	NT		NT		NT		NT	
Endrin	20*	0.4*	NT		0.0222	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Endrin aldehyde	20*	0.4*	NT		0.0219	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Endrin ketone	20*	0.4*	NT		0.0175	D	NT		NT		NT		0.00335	U	NT		NT		0.0155	D	NT		NT		NT		NT	
gamma-BHC (Lindane)	20	0.04	NT		0.00705	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Heptachlor epoxide	0.067	0.02	NT		**0.0342**	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Herbicides	Varies	Varies	NT		ND		NT		NT		NT		ND		NT		NT		ND		NT		NT		NT		NT	
Extractable Total Petroleum Hydrocarbons (ETPH)	mg/kg	mg/kg																											
ETPH (Extractable Total Petroleum Hydrocarbons)	500	2500	NT		59.8		NT		NT		NT		156		NT		NT		191		NT		NT		NT		NT	
Metals	mg/kg	mg/L			mg/kg								mg/kg						mg/kg		mg/kg								
Antimony	27	~	NT		7.56		NT		9.41		9.06		16.9		NT		2.68	U	58.5		3.35	U	2.84	U	NT		NT	
Arsenic	10	~	16.6		17.1		16.9		29.7		15		22.8		15.8		5.53		18.2		8.31		2.8		NT		NT	
Barium	4700	~	NT		1120		NT		1120		1300		2310		NT		473		1990		1320		140		NT		NT	
Cadmium	34	~	NT		23.4		NT		13.1		8.01		19.8		NT		1.72		38.9		8.58		0.586		NT		NT	
Chromium	4000	~	NT		317		NT		109		116		237		NT		136		3220		271		86.1		NT		NT	
Copper	2500	~	NT		949		NT		1180		571		2290		NT		132		2600		502		27.3		NT		NT	
Lead	400	~	1250		1760		2260		2650		2100		3010		13700		1230		3440		1720		17.4		NT		NT	
Mercury	20	~	NT		0.698		NT		1.35		0.99		1.52		NT		0.112		0.778		0.552		0.0341	U	NT		NT	
Nickel	1400	~	NT		212		NT		124		101		206		NT		149		1080		148		41		NT		NT	
Silver	340	~	NT		6.94		NT		4.06		0.624	U	106		NT		0.536	U	59.9		0.67	U	0.568	U	NT		NT	
Vanadium	470	~	NT		98.3		NT		127		140		120		NT		80.4		143		154		55.3		NT		NT	
Zinc	20000	~	NT		1990		NT		4000	D	2220		6380	D	NT		273		3460		1740		53		NT		NT	
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																											
Aroclor 1248	~	~	0.35		0.0299	U	NT		NT		NT		0.0335	U	NT		NT		0.0347	U	NT		NT		0.0307	U	0.0309	U
Aroclor 1254	~	~	0.0306	U	0.155		NT		NT		NT		0.238		NT		NT		0.112		NT		NT		0.315		0.2	
Aroclor 1260	~	~	0.0306	U	0.0299	U	NT		NT		NT		0.0335	U	NT		NT		0.0817		NT		NT		0.0307	U	0.0309	U
Aroclor 1262	~	~	0.281		0.0299	U	NT		NT		NT		0.443		NT		NT		0.0347	U	NT		NT		0.201		0.0309	U
Aroclor 1268	~	~	0.0306	U	0.0655		NT		NT		NT		0.0335	U	NT		NT		0.0347	U	NT		NT		0.0307	U	3.07	D
Total PCBs	1	~	0.631		0.221		NT		NT		NT		0.681		NT		NT		0.194		NT		NT		0.516		3.3	

NOTES:
Only analytes with detections are shown in table
~ = Indicates no regulatory limit has been established for this analyte
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Bold indicates an exceedance of the Pollutant Mobility Criteria
Shaded indicates an exceedance of the Residential Direct Exposure Criteria
Italics indicates laboratory reporting limits above CTDEEP criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 17 April 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 6A
October 2018 Soil Boring Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Depth (feet)/Parent Sample Sampling Date Sample Matrix	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-96_2-3 2-3 10/16/2018 Soil		SS-103_1-2 1-2 10/16/2018 Soil		SS-103_2-3 2-3 10/16/2018 Soil		SS-103_3-4 3-4 10/16/2018 Soil		SS-103_4-5 4-5 10/16/2018 Soil		SS-103_5-6 5-6 10/16/2018 Soil		SS-104_1-2 1-2 10/16/2018 Soil		SS-104_2-3 2-3 10/16/2018 Soil		SS-105_1-2 1-2 10/16/2018 Soil		DUP_1 SS-105_1-2 10/16/2018 Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds (VOCs)	mg/kg	mg/kg																				
1,2-Dibromoethane	0.007	0.1	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Acetone	500	140	NT		NT		NT		NT		NT		NT		NT		NT		0.011	U	0.021	
cis-1,2-Dichloroethylene	~	~	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Tetrachloroethylene	12	1	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Toluene	500	67	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
trans-1,2-Dichloroethylene	~	20	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Trichloroethylene	56	1	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Vinyl Chloride	0.32	0.4	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Semi-Volatile Organic Compounds (SVOCs)	mg/kg	mg/kg																				
Acenaphthene	1,000*	84*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Anthracene	1000	400	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(a)anthracene	1	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(a)pyrene	1	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(b)fluoranthene	1	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(g,h,i)perylene	8.4*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(k)fluoranthene	8.4	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Carbazole	31*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Chrysene	84*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Dibenzofuran	68*	1.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Fluoranthene	1000	56	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Fluorene	1000	56	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Indeno(1,2,3-cd)pyrene	1*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Phenanthrene	1000	40	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Pyrene	1000	40	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Pesticides	mg/kg	mg/kg																				
4,4'-DDD	1.8*	0.02*	NT		NT		NT		NT		NT		NT		NT		NT		0.00703	D	0.00272	U
4,4'-DDT	1.8*	0.02*	NT		NT		NT		NT		NT		NT		NT		NT		0.00374	D	0.00272	U
Alachlor	7.7	0.4	NT		NT		NT		NT		NT		NT		NT		NT		0.0187	D	0.00272	U
Aldrin	0.04*	0.01*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
beta-BHC	~	~	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Chlordane, total	0.49*	0.066*	NT		NT		NT		NT		NT		NT		NT		NT		0.0562	U	0.0544	U
delta-BHC	~	~	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Dieldrin	0.038	0.007	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Endrin	20*	0.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Endrin aldehyde	20*	0.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Endrin ketone	20*	0.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
gamma-BHC (Lindane)	20	0.04	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Heptachlor epoxide	0.067	0.02	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Herbicides	Varies	Varies	NT		NT		NT		NT		NT		NT		NT		NT		ND		ND	
Extractable Total Petroleum Hydrocarbons (ETPH)	mg/kg	mg/kg																				
ETPH (Extractable Total Petroleum Hydrocarbons)	500	2500	NT		NT		NT		NT		NT		NT		NT		NT		44.5	U	43.5	U
Metals	mg/kg	mg/L																	mg/kg		mg/kg	
Antimony	27	~	NT		NT		NT		NT		NT		NT		NT		NT		2.81	U	2.72	U
Arsenic	10	~	NT		NT		NT		NT		NT		NT		NT		NT		6.97		5.85	
Barium	4700	~	NT		NT		NT		NT		NT		NT		NT		NT		483		441	
Cadmium	34	~	NT		NT		NT		NT		NT		NT		NT		NT		1.95		1.31	
Chromium	4000	~	NT		NT		NT		NT		NT		NT		NT		NT		166		157	
Copper	2500	~	NT		NT		NT		NT		NT		NT		NT		NT		116		103	
Lead	400	~	NT		NT		NT		NT		NT		NT		NT		NT		99.7		111	
Mercury	20	~	NT		NT		NT		NT		NT		NT		NT		NT		0.0337	U	0.0419	
Nickel	1400	~	NT		NT		NT		NT		NT		NT		NT		NT		90.7		89.2	
Silver	340	~	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.544	U
Vanadium	470	~	NT		NT		NT		NT		NT		NT		NT		NT		95.4		90	
Zinc	20000	~	NT		NT		NT		NT		NT		NT		NT		NT		293		368	
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																				
Aroclor 1248	~	~	0.0262	U	0.0329	U	1.56	D	0.0251	U	0.0287	U	0.0303	U	0.149	U	0.0296	U	0.0281	U	0.0272	U
Aroclor 1254	~	~	0.0262	U	1.36		0.0614	U	0.0251	U	0.0287	U	0.137		5.08	D	0.0296	U	0.0633		0.0272	U
Aroclor 1260	~	~	0.0262	U	0.0329	U	0.0614	U	0.0251	U	0.0287	U	0.115		0.149	U	0.0296	U	0.0281	U	0.0272	U
Aroclor 1262	~	~	0.0262	U	1.12		1.34	D	0.0251	U	0.0287	U	0.0303	U	0.149	U	0.0296	U	0.0281	U	0.0272	U
Aroclor 1268	~	~	0.0262	U	0.0329	U	0.0614	U	0.0251	U	0.0287	U	0.0303	U	0.149	U	0.0296	U	0.0281	U	0.0272	U
Total PCBs	1	~	0.0262	U	2.48		2.9	D	0.0251	U	0.0287	U	0.251		5.08	D	0.0296	U	0.0633		0.0272	U

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mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Bold indicates an exceedance of the Pollutant Mobility Criteria
Shaded indicates an exceedance of the Residential Direct Exposure Criteria
Italics indicates laboratory reporting limits above CTDEEP criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 17 April 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 6B
October 2018 Hand Auger Soil Sampling Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-1_0-0.25		HA-SS-1_0.5-1		HA-SS-1_1-1.5		HA-SS-2_0-0.25		HA-SS-2_0.5-1		HA-SS-2_1-1.5		HA-SS-3_0-0.25		HA-SS-3_0.5-1		HA-SS-3_1-1.5		HA-SS-4_0-0.25		HA-SS-4_0.5-1		HA-SS-4_1-1.5		HA-SS-5_0-0.25		HA-SS-5_0.5-1		HA-SS-5_1-1.5	
Sampling Depth (feet)/Parent Sample			0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1.-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5	
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Aroclor 1248	~	~	0.0326	U	0.033	U	0.0328	U	0.0322	U	0.0305	U	0.0323	U	0.0321	U	0.0336	U	0.0325	U	0.0348	U	0.0327	U	0.0353	U	0.0287	U	0.862		0.461	
Aroclor 1254	~	~	0.0326	U	0.451		0.96		0.0322	U	0.0305	U	0.0323	U	0.047		0.237		4.8	D	0.0348	U	0.0327	U	0.0353	U	0.0532		0.0339	U	0.0298	U
Aroclor 1260	~	~	0.0326	U	0.033	U	0.0328	U	0.0322	U	0.0305	U	0.0598		0.0321	U	0.0336	U	0.0325	U	0.0348	U	0.0327	U	0.131		0.0287	U	0.409		0.271	
Aroclor 1262	~	~	0.0326	U	0.182		0.394		0.0322	U	0.0305	U	0.0323	U	0.0321		0.238		1.24		0.0348	U	0.0327	U	0.0353	U	0.0287	U	0.0339	U	0.0298	U
Aroclor 1268	~	~	0.0326	U	0.033	U	0.0328	U	0.0322	U	0.0305	U	0.0323	U	0.0321	U	0.0336	U	0.0325	U	0.0348	U	0.0327	U	0.0353	U	0.0335		0.0339	U	0.0298	U
Total PCBs	1	~	0.0326	U	0.633		1.35		0.0322	U	0.0305	U	0.0598		0.0792		0.475		1.24		0.0348	U	0.0327	U	0.131		0.0867		1.27		0.732	

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-6_0-0.25		HA-SS-6_0.5-1		HA-SS-6_1-1.5		HA-SS-7_0-0.25		HA-SS-7_0.5-1		HA-SS-7_1-1.5		HA-SS-8_0-0.25		HA-SS-8_0.5-1		HA-SS-8_1-1.5		HA-SS-9_0-0.25		HA-SS-9_0.5-1		HA-SS-9_1-1.5		HA-SS-10_0-0.25		HA-SS-10_0.5-1		HA-SS-10_1-1.5	
Sampling Depth (feet)/Parent Sample			0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5	
Sampling Date			10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Aroclor 1248	~	~	0.0341	U	0.0315	U	0.0302	U	0.0844		0.459		0.821		0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.312		0.486		0.0348	U	0.0346	U	0.0328	U
Aroclor 1254	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.0318	U	0.0269	U	0.0328	U	0.0323	U	0.211		0.0272	U	0.0372	U	0.0332	U	0.0348	U	0.0346	U	0.0328	U
Aroclor 1260	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.162		0.296		0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.124		0.279		0.0348	U	0.0346	U	0.192	
Aroclor 1262	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.0318	U	0.0269	U	0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.0372	U	0.0332	U	0.0348	U	0.0346	U	0.0328	U
Aroclor 1268	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.0318	U	0.0269	U	0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.0372	U	0.0332	U	0.0348	U	0.0346	U	0.0328	U
Total PCBs	1	~	0.0341	U	0.0315	U	0.0302	U	0.0844		0.621		1.12		0.0328	U	0.0323	U	0.211		0.0272	U	0.436		0.765		0.0348	U	0.0346	U	0.192	

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-11_0-0.25		HA-SS-11_0.5-1		HA-SS-11_1-1.5		Dup-2 HA-SS-11_1-1.5		HA-SS-12_0-0.25		HA-SS-12_0.5-1		HA-SS-12_1-1.5		HA-SS-13_0-0.25		HA-SS-13_0.5-1		HA-SS-13_1-1.5		HA-SS-14_0-0.25		HA-SS-14_0.5-1		HA-SS-14_1-1.5		HA-SS-15_0-0.25		HA-SS-15_0.5-1	
Sampling Depth (feet)/Parent Sample			0-0.25		0.5-1		1-1.5		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1	
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		10		1		5		1		1		10		1		1		10		1		1		1		1		1	
Aroclor 1248	~	~	0.823		8.31	D	1.55		2.75	D	0.165		0.594		6.08	D	0.249		0.629		6.5	D	0.118		0.141		0.0548		0.384		0.578	
Aroclor 1254	~	~	0.0309	U	0.328	U	0.0334	U	0.159	U	0.0314	U	0.0351	U	0.302	U	0.03	U	0.0384	U	0.317	U	0.0322	U	0.0378	U	0.0327	U	0.0317	U	0.0306	U
Aroclor 1260	~	~	0.155		1.77	D	0.46		0.654	D	0.0538		0.107		1.08	D	0.0488		0.063		0.894	D	0.0322	U	0.0378	U	0.0327	U	0.0994		0.11	
Aroclor 1262	~	~	0.0309	U	0.328	U	0.0334	U	0.159	U	0.0314	U	0.0351	U	0.302	U	0.03	U	0.0384	U	0.317	U	0.0322	U	0.0378	U	0.0327	U	0.0317	U	0.0306	U
Aroclor 1268	~	~	0.0309	U	0.328	U	0.0334	U	0.159	U	0.0314	U	0.0351	U	0.302	U	0.03	U	0.0384	U	0.317	U	0.0322	U	0.0378	U	0.0327	U	0.0317	U	0.0306	U
Total PCBs	1	~	0.978		10.1	D	2.01		3.4	D	0.218		0.702		7.16	D	0.298		0.692		7.4	D	0.118		0.141		0.0548		0.484		0.688	

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-15_1-1.5		HA-SS-16_0-0.25		HA-SS-16_0.5-1		HA-SS-16_1-1.5		HA-SS-17_0-0.25		HA-SS-17_0.5-1		HA-SS-17_1-1.5		Dup-3 HA-SS-17_1-1.5		HA-SS-18_0-0.25		HA-SS-18_0.5-1		HA-SS-18_1-1.5		HA-SS-19_0-0.25		HA-SS-19_0.5-1		HA-SS-19_1-1.5		HA-SS-20_0-0.25	
Sampling Depth (feet)/Parent Sample			1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25	
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Aroclor 1248	~	~	0.234		0.146		0.0806		0.115		0.329		0.575		0.23		0.249		0.0341		0.112		1.1		0.032	U	0.12		0.81		0.0317	U
Aroclor 1254	~	~	0.0309	U	0.0303	U	0.0316	U	0.0328	U	0.0304	U	0.0364	U	0.0284	U	0.0332	U	0.0324	U	0.0327	U	0.0341	U	0.032	U	0.0318	U	0.0364	U	0.0317	U
Aroclor 1260	~	~	0.0476		0.0599		0.0316	U	0.0384		0.149		0.171		0.174		0.195		0.0324	U	0.0754		0.284		0.032	U	0.0452		0.298		0.0317	U
Aroclor 1262	~	~	0.0309	U	0.0303	U	0.0316	U	0.0328	U	0.0304	U	0.0364	U	0.0284	U	0.0332	U	0.0324	U	0.0327	U	0.0341	U	0.032	U	0.0318	U	0.0364	U	0.0317	U
Aroclor 1268	~	~	0.0309	U	0.0303	U	0.0316	U	0.0328	U	0.0304	U	0.0364	U	0.0284	U	0.0332	U	0.0324	U	0.0327	U	0.0341	U	0.032	U	0.0318	U	0.0364	U	0.0317	U
Total PCBs	1	~	0.282		0.206		0.0806		0.154		0.478		0.745		0.404		0.444		0.0341		0.187		1.39		0.032	U	0.165		1.11		0.0317	U

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-20_0.5-1		HA-SS-20_1-1.5		HA-SS-21_0-0.25		HA-SS-21_0.5-1		HA-SS-21_1-1.5		HA-SS-22_0-0.25		HA-SS-22_0.5-1		HA-SS-22_1-1.5		HA-SS-23_0-0.25		HA-SS-23_0.5-1		HA-SS-23_1-1.5		HA-SS-24_0-0.25		HA-SS-24_0.5-1		HA-SS-24_1-1.5		Dup-4 18J0945-32	
Sampling Depth (feet)/Parent Sample			0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		1		1		1		1		1		1		2		1		1		1		1		1		1		1	
Aroclor 1248	~	~	0.0318	U	0.369		0.0379	U	0.0337	U	0.0347	U	0.033	U	**0.0478**		2.62	D	0.0366	U	0.0318	U	0.149		0.0337	U	0.0377	U	0.168		0.0942	
Aroclor 1254	~	~	0.0318	U	0.0286	U	0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0612	U	0.0366	U	0.0318	U	0.0308	U	0.0337	U	0.0377	U	0.0319	U	0.0367	U
Aroclor 1260	~	~	0.0318	U	0.103		0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0876	D	0.0366	U	0.0318	U	0.0549		0.0337	U	0.0377	U	0.294		0.111	
Aroclor 1262	~	~	0.0318	U	0.0286	U	0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0612	U	0.0366	U	0.0318	U	0.0308	U	0.0337	U	0.0377	U	0.0319	U	0.0367	U
Aroclor 1268	~	~	0.0318	U	0.0286	U	0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0612	U	0.0366	U	0.0318	U	0.0308	U	0.0337	U	0.0377	U	0.0319	U	0.0367	U
Total PCBs	1	~	0.0318	U	0.472		0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0478		2.71	D	0.0366	U	0.0318	U	0.204		0.0337	U	0.0377	U	0.461		0.205	

NOTES:
D = Result is from an analysis that required a dilution
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
~ = Indicates no regulatory limit has been established for this analyte
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Shaded indicates an exceedance of the Residential Direct Exposure

Table 6C
October 2018 Groundwater Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Parent Sample Sampling Date Client Matrix	Surface-Water Protection Criteria	Residential Groundwater Volatilization Criteria	MW-1 10/30/2018 Groundwater		MW-2 10/30/2018 Groundwater		MW-3 10/30/2018 Groundwater		DUP-01 MW-3 10/30/2018 Groundwater		MW-4 10/30/2018 Groundwater	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
VOCs (ug/L)												
Chloroform	14,100	287	0.53		0.5	U	0.5	U	0.5	U	NT	
cis-1,2-Dichloroethylene	6,200*	~	12		5		15		15		NT	
Tetrachloroethylene	88	1,500	3.5		2.1		3.4		3.4		NT	
trans-1,2-Dichloroethylene	10,000*	~	1.9		3.3		3.7		3.7		NT	
Trichloroethylene	2,340	219	31		43		38		38		NT	
SVOCs (ug/L)												
Total SVOCs	~	~	Varies	U	Varies	U	Varies	U	Varies	U	NT	
Pesticides (ug/L)												
Total Pesticides	~	~	Varies	U	Varies	U	Varies	U	Varies	U	NT	
ETPH (ug/L)												
ETPH (Extractable Total Petroleum Hydrocarbons)	250*	~	122		106		109		98		NT	
Dissolved Metals (ug/L)												
Antimony	86,000	~	1.11	U	1.11	U	1.32		1.23		NT	
Barium	2,200*	~	91.8		93.3		101		105		NT	
Copper	48	~	1.48		1.34		4.27		4.32		NT	
Nickel	880	~	2.55		3.46		1.54		1.38		NT	
Selenium	50	~	2.57		1.11	U	6.52		3.9		NT	
Vanadium	270*	~	1.11	U	1.11	U	2.18		2.13		NT	
Zinc	123	~	11.1		8.59		11.9		7.77		NT	
Herbicides (ug/L)												
Total Herbicides	~	~	5	U	5	U	5	U	5	U	NT	
PCBs (ug/L)												
Total PCBs	0.500	~	0.0526	U	0.0526	U	0.0513	U	0.0513	U	0.1000	U

NOTES:
Only detected analytes are shown on this table
Analysis Performed = VOCs (EPA 8260C), SVOCs (EPA 8270D), Pesticides (8081B), Herbicides (8151A), ETPH (CTETPH), PCBS (8082A), & Metals (6020B)
~ = Indicates no regulatory limit has been established for this analyte
ug/L = Micrograms per liter
NT=this indicates the analyte was not a target for this sample
* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 20 September 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
you need to check dates

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Table 7A
September 2020 Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecicut
Langan Project No.: 140147201

Boring ID Sample ID Sampling Date Sampling Depth (feet)	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-201 SB-201(2-3) 9/2/2020 2-3		SB-202 SB-202(1-2) 9/2/2020 1-2		SB-203 SB-203(3-4) 9/2/2020 3-4		SB-204 SB-204(2-3) 9/2/2020 2-3		SB-205 SB-205(4-5) 9/2/2020 4-5		SB-205 DUP-1 (SB-205(4-5)) 9/2/2020 4-5	
Compound			**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
VOCs (mg/kg)														
Acetone	500	140	0.0094		0.0099	U	0.0085	U	0.0092	U	0.0082	U	0.013	
Total Metals (mg/kg)														
Arsenic	10	~	1.79		3.6		1.55		4.22		4.05		4.01	
Barium	4700	~	105		111		334		98.6		141		159	
Cadmium	34	~	0.328	U	0.363		0.639		0.35		0.318	U	0.357	
Chromium, Total	~	~	53.7		29.9		94.5		32.4		62.2		65.3	
Copper	2500	~	18		19.1		47.9		21		19.1		22.3	
Lead	400	~	12.6		46.8		22.8		35.7		16.2		17.8	
Mercury	20	~	0.0417		0.104		0.0306	U	0.0631		0.0415		0.0434	
Nickel	1400	~	28.4		19.1		35.6		22.2		33.5		36.1	
Vanadium	470	~	41.3		35.7		106		34.5		55		54.1	
Zinc	20000	~	40.7		54.3		82.4		63.1		48.9		49.6	

Notes:

1. Soil sample analytical results are compared to the Connecticut Department of Energy and Environmental Protection (CT DEEP) Remediation Standard Regulations (RSRs) (August 2017) and to the CTDEEP Additional Polluting Service (APS) (September 2018).
2. Only detected analytes are shown in the table.
3. ~ = Regulatory limit for this analyte does not exist
4. mg/kg = milligrams per kilogram
5. VOC = volatile organic compounds

Qualifiers:
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.

Table 7B
September 2020 Groundwater Analytical Results
1 Western Junior Highway
Greenwich, Connecicut
Langan Project No.: 140147201

Sample ID Sampling Date	Surface Water Protection Criteria	Residential Volatilization Criteria	MW-2 9/17/2020		MW-6 9/17/2020		MW-7 9/17/2020		Dup-01 (MW-7) 9/17/2020	
Compound			Result	Q	Result	Q	Result	Q	Result	Q
VOCs (µg/L)										
Cis-1,2-Dichloroethene	6200*	~	2.4		45		2.4		2.5	
Tetrachloroethene (PCE)	88	1500	2.8		1.1		2.3		2.4	
Trans-1,2-Dichloroethene	10000*	~	2.3		5.2		4.7		4.7	
Trichloroethene (TCE)	2340	219	36		34		46		45	
Total Metals (µg/L)										
Antimony	86000	~	1.11	U	1.11	U	1.5		1.44	
Arsenic	4	~	1.11	U	1.11	U	1.47		1.24	
Barium	2200*	~	113		67.7		154		148	
Chromium, Total	~	~	3.37		1.11	U	7.69		5.68	
Copper	48	~	4.17		1.12		5.85		4.19	
Lead	13	~	1.47		1.11	U	1.79		1.49	
Nickel	880	~	3.13		3.14		5.32		4.59	
Selenium	50	~	1.48		1.11	U	4.07		4.64	
Vanadium	270*	~	2.35		1.11	U	6.66		5.1	
Zinc	123	~	15.2		9.64		11.7		12.8	

Notes:

1. Groundwater sample analytical results are compared to the Connecticut Department of Energy and Environmental Protection (CT DEEP) Remediation Standard Regulations (RSRs) (August 2017) and to the CTDEEP Additional Polluting Service (APS) (September 2018).

2. Only detected analytes are shown in the table.
3. Analysis Performed = VOCs (EPA 8260C), SVOC PAHs (EPA 8270D), Pesticides (8081B), Herbicides (8151A), PCBS (8082A), & Metals (6020B)
4. ~ = Indicates no regulatory limit habeen established for this analyte
5. ug/l = micrograms per liter
6. VOC = volatile organic compound
7. * = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 20 September 2018) Technical Support Document.

Qualifiers:
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-301A 8/17/2021 1-1.5 ft bg				SB-301B 8/17/2021 5-5.5 ft bg				SB-302A 8/17/2021 2-2.5 ft bg				SB-302B 8/17/2021 6.5-7 ft bg				SB-303A 8/16/2021 2.5-3 ft bg				SB-303B 8/16/2021 5.5-6 ft bg				SB-304A 8/16/2021 1-1.5 ft bg				SB-304B 8/16/2021 2-2.5 ft bg				SB-305A 8/16/2021 1-1.5 ft bg				SB-305B 8/16/2021 3-3.5 ft bg			
				Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																														
Acetone	500	1,000	140	ND	U	0.014	1	ND	U	0.01	1	ND	U	0.0091	1	ND	U	0.0091	1	ND	U	0.017	1	ND	U	0.012	1	ND	U	0.017	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.011	1
Cis-1,2-Dichloroethene	500	1,000	14	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	0.011		0.0084	1	ND	U	0.0058	1	0.012		0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Methyl Ethyl Ketone (2-Butanone)	500	1,000	80	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	ND	U	0.0084	1	ND	U	0.0058	1	ND	U	0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Methylene Chloride	82	760	1	ND	U	0.014	1	ND	U	0.01	1	ND	U	0.0091	1	ND	U	0.0091	1	ND	U	0.017	1	ND	U	0.012	1	ND	U	0.017	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.011	1
Naphthalene	1,000	2,500	56	ND	U	0.014	1	ND	U	0.01	1	ND	U	0.0091	1	ND	U	0.0091	1	ND	U	0.017	1	ND	U	0.012	1	ND	U	0.017	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.011	1
Tetrachloroethene (PCE)	12	110	1	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	ND	U	0.0084	1	ND	U	0.0058	1	0.0087		0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Trans-1,2-Dichloroethene	500	1,000	20	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	ND	U	0.0084	1	ND	U	0.0058	1	ND	U	0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Trichloroethene (TCE)	56	520	1	0.027		0.0071	1	0.0054		0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	0.13		0.0084	1	0.097		0.0058	1	0.13		0.0086	1	0.038		0.0052	1	0.023		0.0058	1	ND	U	0.0053	1
Semi-Volatile Organic Compounds (mg/kg)																																														
2-Methylnaphthalene	270	* 1,000	* 5.6	* ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Acenaphthene	1,000	* 2,500	* 84	* ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Acenaphthylene	1,000	2,500	84	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Anthracene	1,000	2,500	400	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(a)anthracene	1	7.8	1	**1.6**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.722		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(a)pyrene	1	1	1	**1.94**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	**1.1**		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(b)fluoranthene	1	7.8	1	**1.59**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.851		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(g,h,i)Perylene	8.4	* 78	* 1	* **1.57**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.924		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(k)fluoranthene	8.4	78	1	**1.52**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.834		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Chrysene	84	* 780	* 1	* **1.55**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.715		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Dibenz(a,h)anthracene	1	* 1	* 1	* ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Fluoranthene	1,000	2,500	56	3.01		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.991		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Fluorene	1,000	2,500	56	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Indeno(1,2,3-cd)pyrene	1	* 7.8	* 1	* **1.63**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.936		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Naphthalene	1,000	2,500	56	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Phenanthrene	1,000	2,500	40	1.38		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Pyrene	1,000	2,500	40	2.41		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.886		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Pesticides (mg/kg)																																														
4,4'-DDD	NS	NS	NS	0.0119		0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	0.0611		0.00308	5	ND	U	0.00277	5	0.0733		0.00289	5	ND	U	0.00255	5
4,4'-DDE	NS	NS	NS	0.107		0.00274	5	ND	U	0.00276	5	0.0145		0.00271	5	ND	U	0.00253	5	0.0349		0.00281	5	0.0164		0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	0.249		0.00289	5	ND	U	0.00255	5
4,4'-DDT	NS	NS	NS	0.0532		0.00274	5	ND	U	0.00276	5	0.0146		0.00271	5	ND	U	0.00253	5	0.0148		0.00281	5	0.00867		0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	0.237		0.00289	5	ND	U	0.00255	5
DDT (Total)	1.8	* 17	* 0.02	* **0.1721**		0.00274	5	ND	U	0.00276	5	**0.0291**		0.00271	5	ND	U	0.00253	5	**0.0497**		0.00281	5	**0.02507**		0.00256	5	**0.0611**		0.00308	5	ND	U	0.00277	5	**0.5593**		0.00289	5	ND	U	0.00255	5
Alachlor	7.7	72	0.4	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Aldrin	0.04	* 0.34	* 0.01	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	* 3.2	* 0.01	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Alpha Endosulfan	NS	NS	NS	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	* 3.2	* 0.01	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Beta Endosulfan	NS	NS	NS	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Chlordane (alpha and gamma)	0.49	2.2	0.066	ND	U	0.0366	5	ND	U	0.0368	5	ND	U	0.0361	5	ND	U	0.0337	5	**0.0747**		0.0374	5	ND	U	0.0341	5	**0.221**		0.041	5	ND	U	0.0369	5	ND	U	0.0385	5	ND	U	0.034	5
Dieldrin	0.038	0.36	0.007	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Endosulfan Sulfate	NS	NS	NS	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Endrin	20	610	0.4	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Herbicides (mg/kg)																																														
Total Herbicides	NS	NS	NS	ND	U	0.0227	1	ND	U	0.0219	1	ND	U	0.022	1	ND	U	0.0202	1	ND	U	0.0227	1	ND	U	0.021	1	ND	U	0.0249	1	ND	U	0.0222	1	ND	U	0.0232	1	ND	U	0.0206	1
Polychlorinated Biphenyls (mg/kg)																																														
PCB-1248 (Aroclor 1248)	NS	NS	NS	ND	U	0.0277	1	ND	U	0.0278	1	1		0.0274	1	0.0737		0.0256	1	0.187		0.0284	1	ND	U	0.0258	1	0.934	PCB-I	0.0311	1	ND	U	0.0279	1	9.28		0.292	10	ND	U	0.0258	1
PCB-1260 (Aroclor 1260)	NS	NS	NS	0.153		0.0277	1	ND	U	0.0278	1	0.111		0.0274	1	ND	U	0.0256	1	0.0784		0.0284	1	0.0634		0.0258	1	0.566		0.0311	1	ND	U	0.0279	1	1.68		0.292	10	ND	U	0.0258	1
PCB-1262 (Aroclor 1262)	NS	NS	NS	ND	U	0.0277	1	ND	U	0.0278	1	ND	U	0.0274	1	ND	U	0.0256	1	ND	U	0.0284	1	ND	U	0.0258	1	ND	U	0.0311	1	ND	U	0.0279	1	ND	U	0.292	10	ND	U	0.0258	1
PCB-1268 (Aroclor 1268)	NS	NS	NS	ND	U	0.0277	1	ND	U	0.0278	1	ND	U	0.0274	1	ND	U	0.0256	1	ND	U	0.0284	1	ND	U	0.0258	1	ND	U	0.0311	1	ND	U	0.0279	1	ND	U	0.292	10	ND	U	0.0258	1
Total PCBs	1	10	NS	0.153		0.0277	1	ND	U	0.0278	1	1.11		0.0274	1	0.0737		0.0256	1	0.265		0.0284	1	0.0634		0.0258	1	1.5		0.0311	1	ND	U	0.0279	1	11		0.292	10	ND	U	0.0258	1
Metals (mg/kg)																																														
Antimony	27	8,200	NS	13.7		2.85	1	4.89		2.8	1	4.47		2.76	1	6.77		2.57	1	3.82		2.85	1	ND	U	2.64	1	48.2		3.14	1	3.63		2.81	1	10.9		2.93	1	ND	U	2.6	1
Arsenic	10	10	NS	5.97		1.71	1	ND	U	1.68	1	4.04		1.66	1	2.21		1.54	1	11.9		1.71	1	5.2		1.58	1	32.1		1.88	1	3.83		1.68	1	9.37		1.76	1	ND	U	1.56	1
Barium	4,700	140,000	NS	570		2.85	1	235		2.8	1	286		2.76	1	510		2.57	1	1,000		2.85	1	334		2.64	1	1,210		3.14	1	252		2.81	1	976		2.93	1	86.9		2.6	1
Cadmium	34	1,000	NS	29.2		0.342	1	0.533		0.336	1	0.601		0.331	1	0.614		0.308	1	13.6		0.342	1	0.452		0.316	1	191		0.377	1	1.26		0.337	1	18.7		0.352	1	ND	U	0.312	1
Chromium, Total	NS	NS	NS	523		0.57	1	99		0.56	1	83.9		0.552	1	181		0.514	1	248		0.57	1	138		0.527	1	2,140		0.628	1	117		0.562	1	528		0.587	1	32		0.52	1
Copper	2,500	76,000	NS	252		2.28	1	35.7		2.24	1	46.7		2.21	1	32.7		2.05	1	881		2.28	1	81.7		2.11	1	860		2.51	1	82.5		2.25	1	454		2.35	1	25.2		2.08	1
Lead	400	1,000	NS	428		0.57	1	11.8		0.56	1	260		0.552	1	14.8		0.514	1	943		0.57	1	112		0.527	1	2,220		0.628	1	231		0.562	1	923		0.587	1	3.79		0.52	1
Mercury	20	610	NS	0.406		0.0342	1	ND	U	0.0336	1	0.0445		0.0331	1	ND	U	0.0308	1	0.627		0.0342	1	0.0709		0.0316	1	0.942		0.0377	1	0.0863		0.0337	1	0.786		0.0352	1	ND	U	0.0312	1
Nickel	1,400	7,500	NS	246		1.14	1	48.5		1.12	1	38.7		1.1	1	77.4		1.03	1	200		1.14	1	69.2		1.05	1	1,960		1.26	1	83.9		1.12	1	242		1.17	1	27.4		1.04	1
Silver	340	10,000	NS	1.37		0.57	1	ND	U	0.56	1	ND	U	0.552	1	ND	U	0.514	1	1.69		0.57	1	ND	U	0.527	1	18.2		0.628	1	ND	U	0.562	1	3.62		0.587	1	ND	U	0.52	1
Vanadium	470	14,000	NS	121		1.14	1	71.4		1.12	1	88.4		1.1	1	86.1		1.03	1	102		1.14	1	76.8		1.05	1	352		1.26	1	67.1		1.12	1	119		1.17	1	30.5		1.04	1
Zinc	20,000	610,000	NS	907		2.85	1	58.8		2.8	1	89.4		2.76	1	78.8		2.57	1	2,100		2.85	1	163		2.64	1	2,250		3.14	1	789		2.81	1	1,520		2.93	1	31.1		2.6	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Compos Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-306A 8/16/2021 1-1.5 ft bg				SB-306B 8/16/2021 4-4.5 ft bg				SB-307A 8/17/2021 2-2.5 ft bg				SB-307B 8/17/2021 6-6.5 ft bg				SB-308 8/17/2021 2-3 ft bg				SB-308 DUP-SO1 2-3 ft bg				SB-309A 8/17/2021 2-2.5 ft bg				SB-309B 8/17/2021 3.5-4 ft bg				SB-310A 8/17/2021 1-1.5 ft bg				SB-310B 8/17/2021 3-3.5 ft bg			
							Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																													
Acetone	500		1,000		140		ND	U	0.012	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.0089	1	ND	U	0.011	1	ND	U	0.012	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0059	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0059	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Methylene Chloride	82		760		1		ND	U	0.012	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.0089	1	ND	U	0.011	1	ND	U	0.012	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1
Naphthalene	1,000		2,500		56		ND	U	0.012	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.0089	1	ND	U	0.011	1	ND	U	0.012	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0059	1	ND	U	0.005	1	0.0056		0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0059	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Trichloroethene (TCE)	56		520		1		0.012		0.0059	1	0.0092		0.005	1	0.044		0.0052	1	ND	U	0.0045	1	0.049		0.0054	1	0.041		0.0061	1	0.038		0.007	1	0.04		0.0055	1	0.024		0.0051	1	ND	U	0.0051	1
Semi-Volatile Organic Compounds (mg/kg)																																													
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Acenaphthylene	1,000		2,500		84		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Anthracene	1,000		2,500		400		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(a)anthracene	1		7.8		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.3**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.568		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(a)pyrene	1		1		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.75**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.68		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.25**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.686		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**1.64**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.21**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Chrysene	84	*	780	*	1	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.52**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.572		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.533	2	ND	U	0.514	2+R6	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Fluoranthene	1,000		2,500		56		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	3.94		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.568		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Fluorene	1,000		2,500		56		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**1.92**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Naphthalene	1,000		2,500		56		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Phenanthrene	1,000		2,500		40		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	1.43		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Pyrene	1,000		2,500		40		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	3.3		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.546		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Pesticides (mg/kg)																																													
4,4'-DDD	NS		NS		NS		ND	U	0.00265	5	0.00949		0.00258	5	0.127		0.00278	5	ND	U	0.00252	5	0.00692		0.00283	5	ND	U	0.00294	5	0.0245		0.00294	5	ND	U	0.00264	5	0.00845		0.00276	5	ND	U	0.0026	5
4,4'-DDE	NS		NS		NS		0.0149		0.00265	5	0.0333		0.00258	5	0.161		0.00278	5	ND	U	0.00252	5	0.0366		0.00283	5	0.0225		0.00294	5	0.104		0.00294	5	ND	U	0.00264	5	0.0235		0.00276	5	ND	U	0.0026	5
4,4'-DDT	NS		NS		NS		0.0182		0.00265	5	0.0176		0.00258	5	0.371		0.00278	5	ND	U	0.00252	5	0.0278		0.00283	5	0.013		0.00294	5	0.0326		0.00294	5	ND	U	0.00264	5	0.0131		0.00276	5	ND	U	0.0026	5
DDT (Total)	1.8	*	17	*	0.02	*	**0.0331**		0.00265	5	**0.06039**		0.00258	5	**0.659**		0.00278	5	ND	U	0.00252	5	**0.07132**		0.00283	5	**0.0355**		0.00294	5	**0.1611**		0.00294	5	ND	U	0.00264	5	**0.04505**		0.00276	5	ND	U	0.0026	5
Alachlor	7.7		72		0.4		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0354	5	ND	U	0.0344	5	**0.128**		0.0371	5	ND	U	0.0335	5	**0.131**		0.0378	5	ND	U	0.0392	5	**0.301**		0.0392	5	**1.37**		0.0352	5	ND	U	0.0369	5	ND	U	0.0347	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	0.00311		0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Endrin	20		610		0.4	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	0.00839		0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Herbicides (mg/kg)																																													
Total Herbicides	NS		NS		NS		ND	U	0.0215	1	ND	U	0.0207	1	ND	U	0.0225	1	ND	U	0.0207	1	ND	U	0.0225	1	ND	U	0.0239	1	ND	U	0.0237	1	ND	U	0.0218	1	ND	U	0.0222	1	ND	U	0.0215	1
Polychlorinated Biphenyls (mg/kg)																																													
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.829		0.0268	1	2.57		0.13	5	0.0597		0.0281	1	ND	U	0.0254	1	0.0707		0.0286	1	0.182		0.0297	1	0.945		0.0297	1	10		0.267	10	0.497		0.0279	1	ND	U	0.0263	1
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.211		0.0268	1	0.23		0.13	5	ND	U	0.0281	1	ND	U	0.0254	1	0.0387		0.0286	1	0.0612		0.0297	1	0.246		0.0297	1	1.84		0.267	10	0.135		0.0279	1	ND	U	0.0263	1
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.0268	1	ND	U	0.13	5	ND	U	0.0281	1	ND	U	0.0254	1	ND	U	0.0286	1	ND	U	0.0297	1	ND	U	0.0297	1	ND	U	0.267	10	ND	U	0.0279	1	ND	U	0.0263	1
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0268	1	ND	U	0.13	5	ND	U	0.0281	1	ND	U	0.0254	1	ND	U	0.0286	1	ND	U	0.0297	1	ND	U	0.0297	1	ND	U	0.267	10	ND	U	0.0279	1	ND	U	0.0263	1
Total PCBs	1		10		NS		1.04		0.0268	1	2.8		0.13	5	0.0597		0.0281	1	ND	U	0.0254	1	0.109		0.0286	1	0.244		0.0297	1	1.19		0.0297	1	11.9		0.267	10	0.632		0.0279	1	ND	U	0.0263	1
Metals (mg/kg)																																													
Antimony	27		8,200		NS		4.9		2.69	1	4.8		2.63	1	4.09		2.84	1	5.42		2.6	1	5.14		2.87	1	5.54		3	1	5.41		2.99	1	12.7		2.73	1	5.59		2.81	1	12.5		2.69	1
Arsenic	10		10		NS		5.6		1.62	1	2.83		1.58	1	5.33		1.7	1	3.01		1.56	1	5.03		1.72	1	5.23		1.8	1	9.68		1.79	1	9.68		1.64	1	3.81		1.68	1	ND	U	1.62	1
Barium	4,700		140,000		NS		512		2.69	1	560		2.63	1	578		2.84	1	445		2.6	1	1,340		2.87	1	434		3	1	722		2.99	1	517		2.73	1	231		2.81	1	890		2.69	1
Cadmium	34		1,000		NS		11		0.323	1	4.17		0.316	1	3.33		0.341	1	0.322		0.313	1	3.93		0.345	1	2.37		0.36	1	4.99		0.358	1	17.8		0.328	1	2.04		0.337	1	0.739		0.323	1
Chromium, Total	NS		NS		NS		232		0.538	1	190		0.527	1	74.9		0.568	1	162		0.521	1	138		0.575	1	127		0.6	1	130		0.597	1	452		0.547	1	163		0.561	1	237		0.539	1
Copper	2,500		76,000		NS		301		2.15	1	87.3		2.11	1	462		2.27	1	53.1		2.08	1	243		2.3	1	155		2.4	1	3,580		2.39	1	231		2.19	1	75.4		2.24	1	20		2.15	1
Lead	400		1,000		NS		678		0.538	1	106		0.527	1	1,570		0.568	1	3.68		0.521	1	697		0.575	1	603		0.6	1	1,220		0.597	1	733		0.547	1	206		0.561	1	3.11		0.539	1
Mercury	20		610		NS		0.72		0.0323	1	0.0489		0.0316	1	0.193		0.0341	1	ND	U	0.0313	1	0.471		0.0345	1	0.4		0.036	1	2		0.0358	1	2.42		0.0328	1	1.15		0.0337	1	ND	U	0.0323	1
Nickel	1,400		7,500		NS		112		1.08	1	99.2		1.05	1	48		1.14	1	78.1		1.04	1	60.1		1.15	1	62.4		1.2	1	74.1		1.19	1	143		1.09	1	64.2		1.12	1	92.4		1.08	1
Silver	340		10,000		NS		ND	U	0.538	1	ND	U	0.527	1	ND	U	0.568	1	ND	U	0.521	1	ND	U	0.575	1	ND	U	0.6	1	2.15		0.597	1	1.35		0.547	1	ND	U	0.561	1	ND	U	0.539	1
Vanadium	470		14,000		NS		90.1		1.08	1	95.1		1.05	1	73		1.14	1	97.1		1.04	1	82.8		1.15	1	89.3		1.2	1	69.7		1.19	1	175		1.09	1	45.5		1.12	1	165		1.08	1
Zinc	20,000		610,000		NS		658		2.69	1	345		2.63	1	984		2.84	1	66.1		2.6	1	905		2.87	1	428		3	1	1,490		2.99	1	724		2.73	1	268		2.81	1	99		2.69	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-311A 8/17/2021 1-2.5 ft bg				SB-311B 8/17/2021 5.5-6 ft bg				SB-312A 8/17/2021 2-2.5 ft bg				SB-312B 8/17/2021 5.5-6 ft bg				SB-313A 8/23/2021 1-1.5 ft bg				SB-313B 8/23/2021 2.5-3 ft bg				SB-314A 8/17/2021 0.5-1 ft bg				SB-314B 8/17/2021 1.5-2 ft bg				SB-315A 8/23/2021 1-1.5 ft bg				SB-315A DUP-SO3 1-1.5 ft bg				SB-315B 8/23/2021 2-2.5 ft bg			
							Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																																		
Acetone	500		1,000		140		ND	U	0.015	1	ND	U	0.0089	1	ND	U	0.012	1	ND	U	0.011	1	ND	U	0.0089	1	ND	U	0.0093	1	ND	U	0.014	1	ND	U	0.012	1	ND	U	0.0089	1	ND	U	0.0092	1	ND	U	0.0099	1
Cis-1,2-Dichloroethene	500		1,000		14		0.0089		0.0077	1	ND	U	0.0044	1	ND	U	0.0061	1	ND	U	0.0057	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0077	1	ND	U	0.0044	1	ND	U	0.0061	1	ND	U	0.0057	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Methylene Chloride	82		760		1		ND	U	0.015	1	0.011		0.0089	1	ND	U	0.012	1	ND	U	0.011	1	ND	U	0.0089	1	ND	U	0.0093	1	ND	U	0.014	1	ND	U	0.012	1	ND	U	0.0089	1	ND	U	0.0092	1	ND	U	0.0099	1
Naphthalene	1,000		2,500		56		ND	U	0.015	1	ND	U	0.0089	1	ND	U	0.012	1	ND	U	0.011	1	ND	U	0.0089	1	ND	U	0.0093	1	0.014		0.014	1	0.018		0.012	1	ND	U	0.0089	1	ND	U	0.0092	1	ND	U	0.0099	1
Tetrachloroethene (PCE)	12		110		1		0.012		0.0077	1	ND	U	0.0044	1	0.0083		0.0061	1	ND	U	0.0057	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0077	1	ND	U	0.0044	1	ND	U	0.0061	1	ND	U	0.0057	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Trichloroethene (TCE)	56		520		1		0.19		0.0077	1	ND	U	0.0044	1	0.034		0.0061	1	0.016		0.0057	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Semi-Volatile Organic Compounds (mg/kg)																																																		
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	1.89		0.548	2	ND	U	0.564	2	ND	U	0.575	2	1.1		0.58	2	ND	U	0.576	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	ND	U	5.48	20	1.81		0.564	2	ND	U	0.575	2	1.91		0.58	2	ND	U	0.576	2
Acenaphthylene	1,000		2,500		84		ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	1.01		0.548	2	ND	U	0.564	2	ND	U	0.575	2	3.66		0.58	2	ND	U	0.576	2
Anthracene	1,000		2,500		400		ND	U	0.589	2	ND	U	0.519	2	0.679		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	14.3		5.48	20	5.26		2.82	10	ND	U	0.575	2	5.86		5.8	20	ND	U	0.576	2
Benzo(a)anthracene	1		7.8		1		ND	U	0.589	2	ND	U	0.519	2	**1.85**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**21.7**		5.48	20	**8.71**		2.82	10	ND	U	0.575	2	**10.8**		5.8	20	ND	U	0.576	2
Benzo(a)pyrene	1		1		1		ND	U	0.589	2	ND	U	0.519	2	**1.94**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**19.3**		5.48	20	**7.51**		2.82	10	ND	U	0.575	2	**7.8**		5.8	20	ND	U	0.576	2
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.589	2	ND	U	0.519	2	**1.7**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**15.6**		5.48	20	**5.89**		2.82	10	ND	U	0.575	2	ND	U	5.8	20	ND	U	0.576	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.589	2	ND	U	0.519	2	**1.39**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**10.8**		5.48	20	**4.28**		0.564	2	ND	U	0.575	2	**4.52**		0.58	2	ND	U	0.576	2
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.589	2	ND	U	0.519	2	**1.59**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**15.3**		5.48	20	**6.47**		2.82	10	ND	U	0.575	2	**6.21**		5.8	20	ND	U	0.576	2
Chrysene	84	*	780	*	1	*	ND	U	0.589	2	ND	U	0.519	2	**1.74**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**18.8**		5.48	20	**7.45**		2.82	10	ND	U	0.575	2	**11**		5.8	20	ND	U	0.576	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**4.27**		0.548	2	**1.8**		0.564	2	ND	U	0.575	2	**1.71**		0.58	2	ND	U	0.576	2
Fluoranthene	1,000		2,500		56		ND	U	0.589	2	ND	U	0.519	2	4.02		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	50.6		13.7	50	19.8		2.82	10	ND	U	0.575	2	18.3		5.8	20	ND	U	0.576	2
Fluorene	1,000		2,500		56		ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	7.41		5.48	20	2.71		0.564	2	ND	U	0.575	2	3.49		0.58	2	ND	U	0.576	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.589	2	ND	U	0.519	2	**1.51**		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**12.7**		5.48	20	**5.53**		2.82	10	ND	U	0.575	2	**3.8**		0.58	2	ND	U	0.576	2
Naphthalene	1,000		2,500		56		ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	2.48		0.548	2	0.66		0.564	2	ND	U	0.575	2	2.46		0.58	2	ND	U	0.576	2
Phenanthrene	1,000		2,500		40		ND	U	0.589	2	ND	U	0.519	2	2.78		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	**45.9**		13.7	50	17		2.82	10	ND	U	0.575	2	28.3		5.8	20	ND	U	0.576	2
Pyrene	1,000		2,500		40		ND	U	0.589	2	ND	U	0.519	2	3.11		0.547	2	ND	U	0.569	2	ND	U	0.577	2	ND	U	0.55	2	36.4		5.48	20	14.6		2.82	10	ND	U	0.575	2	26.1		5.8	20	ND	U	0.576	2
Pesticides (mg/kg)																																																		
4,4'-DDD	NS		NS		NS		0.0297		0.00296	5	ND	U	0.00262	5	0.0448		0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	0.0212		0.00271	5	0.0158		0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
4,4'-DDE	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	0.259		0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	0.0916		0.00278	5	0.128		0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	0.102		0.00284	5	ND	U	0.00281	5
4,4'-DDT	NS		NS		NS		0.072		0.00296	5	ND	U	0.00262	5	0.201		0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	0.152		0.00278	5	0.172		0.00271	5	0.156		0.00281	5	ND	U	0.00287	5	0.0704		0.00284	5	ND	U	0.00281	5
DDT (Total)	1.8	*	17	*	0.02	*	**0.1017**		0.00296	5	ND	U	0.00262	5	**0.5048**		0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	**0.2436**		0.00278	5	**0.3212**		0.00271	5	**0.1718**		0.00281	5	ND	U	0.00287	5	**0.1724**		0.00284	5	ND	U	0.00281	5
Alachlor	7.7		72		0.4		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		**0.238**		0.0394	5	ND	U	0.0349	5	**1.06**		0.0365	5	ND	U	0.0383	5	ND	U	0.0385	5	ND	U	0.037	5	ND	U	0.0362	5	ND	U	0.0374	5	ND	U	0.0383	5	ND	U	0.0379	5	ND	U	0.0375	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Endrin	20		610		0.4	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Herbicides (mg/kg)																																																		
Total Herbicides	NS		NS		NS		ND	U	0.0243	1	ND	U	0.0209	1	ND	U	0.0217	1	ND	U	0.0232	1	ND	U	0.0234	1	ND	U	0.0225	1	ND	U	0.0221	1	ND	U	0.0226	1	ND	U	0.0233	1	ND	U	0.0235	1	ND	U	0.0232	1
Polychlorinated Biphenyls (mg/kg)																																																		
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.972		0.0299	1	0.434		0.0265	1	5.74		0.138	5	0.0343		0.029	1	0.253		0.0291	1	7.05		0.281	10	1.77		0.0548	2	1.19		0.0284	1	6.22		0.29	10	8.37		0.287	10	3.85		0.284	10
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.17		0.0299	1	ND	U	0.0265	1	0.688		0.138	5	ND	U	0.029	1	0.0433		0.0291	1	1.24		0.281	10	0.297		0.0548	2	0.227		0.0284	1	0.457		0.29	10	0.538		0.287	10	0.35		0.284	10
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.0299	1	ND	U	0.0265	1	ND	U	0.138	5	ND	U	0.029	1	ND	U	0.0291	1	ND	U	0.281	10	ND	U	0.0548	2	ND	U	0.0284	1	ND	U	0.29	10	ND	U	0.287	10	ND	U	0.284	10
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0299	1	ND	U	0.0265	1	ND	U	0.138	5	ND	U	0.029	1	ND	U	0.0291	1	ND	U	0.281	10	ND	U	0.0548	2	ND	U	0.0284	1	ND	U	0.29	10	ND	U	0.287	10	0.496		0.284	10
Total PCBs	1		10		NS		1.14		0.0299	1	0.434		0.0265	1	6.43		0.138	5	0.0343		0.029	1	0.296		0.0291	1	8.29		0.281	10	2.07		0.0548	2	1.42		0.0284	1	6.68		0.29	10	8.91		0.287	10	4.69		0.284	10
Metals (mg/kg)																																																		
Antimony	27		8,200		NS		29.2		3.05	1	6.27		2.66	1	9.77		2.78	1	5.03		2.94	1	ND	U	2.94	1	4.26		2.83	1	6.49		2.8	1	3.42		2.85	1	ND	U	2.93	1	ND	U	2.96	1	ND	U	2.93	1
Arsenic	10		10		NS		24.4		1.83	1	2.49		1.6	1	17.8		1.67	1	4.64		1.77	1	2.91		1.77	1	5.26		1.7	1	3.14		1.68	1	3.57		1.71	1	2.45		1.76	1	2.66		1.77	1	2.21		1.76	1
Barium	4,700		140,000		NS		3,490		3.05	1	344		2.66	1	1,170		2.78	1	194		2.94	1	283		2.94	1	384		2.83	1	203		2.8	1	200		2.85	1	167		2.93	1	174		2.96	1	314		2.93	1
Cadmium	34		1,000		NS		12.1		0.366	1	0.447		0.319	1	11		0.333	1	ND	U	0.353	1	0.827		0.353	1	5.54		0.34	1	1.44		0.336	1	1.59		0.342	1	0.639		0.352	1	0.583		0.355	1	1.38		0.351	1
Chromium, Total	NS		NS		NS		217		0.609	1	138		0.532	1	288		0.555	1	94.5		0.588	1	73.3		0.589	1	124		0.567	1	131		0.559	1	91.7		0.57	1	80.4		0.586	1	84.3		0.592	1	76.7		0.585	1
Copper	2,500		76,000		NS		829		2.44	1	56.7		2.13	1	926		2.22	1	25.5		2.35	1	101		2.35	1	570		2.27	1	92.4		2.24	1	144		2.28	1	40.5		2.34	1	58.6		2.37	1	119		2.34	1
Lead	400		1,000		NS		28,100		3.05	5	5.83		0.532	1	2,640		0.555	1	31.6		0.588	1	57.3		0.589	1	346		0.567	1	152		0.559	1	114		0.57	1	32.7		0.586	1	59.8		0.592	1	235		0.585	1
Mercury	20		610		NS		0.928		0.0366	1	ND	U	0.0319	1	0.785		0.0333	1	0.0638		0.0353	1	0.0558		0.0353	1	0.0782		0.034	1	0.0922		0.0336	1	0.128		0.0342	1	ND	U	0.0352	1	0.0648		0.0355	1	0.118		0.0351	1
Nickel	1,400		7,500		NS		233		1.22	1	58.2		1.06	1	174		1.11	1	50.5		1.18	1	53.6		1.18	1	126		1.13	1	65.5		1.12	1	67.7		1.14	1	47.8		1.17	1	53.7		1.18	1	80.7		1.17	1
Silver	340		10,000		NS		2.05		0.609	1	ND	U	0.532	1	6.62		0.555	1	ND	U	0.588	1	ND	U	0.589	1	2.6		0.567	1	ND	U	0.559	1	32.9		0.57	1	ND	U	0.586	1	ND	U	0.592	1	ND	U	0.585	1
Vanadium	470		14,000		NS		424		1.22	1	101		1.06	1	93.8		1.11	1	64.6		1.18	1	62.2		1.18	1	100		1.13	1	82		1.12	1	86.6		1.14	1	59.3		1.17	1	58.6		1.18	1	50.7		1.17	1
Zinc	20,000		610,000		NS		5,310		15.2	5	94.5		2.66	1	2,090		2.78	1	63.5		2.94	1	164		2.94	1	799	B	2.83	1	216		2.8	1	261		2.85	1	82.1		2.93	1	98.8	B	2.96	1	277		2.93	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-316A 8/23/2021 1-1.5 ft bg					SB-316B 8/23/2021 3-3.5 ft bg					SB-317A 8/18/2021 2-2.5 ft bg					SB-317B 8/18/2021 5.5-6 ft bg					SB-318A 8/23/2021 0.5-1 ft bg					SB-318B 8/23/2021 1-1.5 ft bg					SB-319A 8/23/2021 0.5-1 ft bg					SB-319B 8/23/2021 1-1.5 ft bg					SB-320A 8/23/2021 0.5-1 ft bg					SB-320B 8/23/2021 1-1.5 ft bg				
							Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																																					
Acetone	500		1,000		140		ND	U	0.0098	1		ND	U	0.012	1		ND	U	0.011	1		ND	U	0.0096	1		ND	U	0.0081	1		ND	U	0.0075	1		ND	U	0.013	1		ND	U	0.011	1		ND	U	0.012	1		ND	U	0.011	1
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Methylene Chloride	82		760		1		ND	U	0.0098	1		ND	U	0.012	1		ND	U	0.011	1		ND	U	0.0096	1		ND	U	0.0081	1		ND	U	0.0075	1		ND	U	0.013	1		ND	U	0.011	1		ND	U	0.012	1		ND	U	0.011	1
Naphthalene	1,000		2,500		56		ND	U	0.0098	1		ND	U	0.012	1		ND	U	0.011	1		ND	U	0.0096	1		ND	U	0.0081	1		ND	U	0.0075	1		ND	U	0.013	1		ND	U	0.011	1		ND	U	0.012	1	0.021	SCAL-E15	0.011	1
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Trichloroethene (TCE)	56		520		1		ND	U	0.0049	1		ND	U	0.0058	1		0.039		0.0054	1		0.012		0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		0.01		0.0055	1
Semi-Volatile Organic Compounds (mg/kg)																																																					
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Acenaphthylene	1,000		2,500		84		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Anthracene	1,000		2,500		400		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(a)anthracene	1		7.8		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(a)pyrene	1		1		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Chrysene	84	*	780	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Fluoranthene	1,000		2,500		56		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Fluorene	1,000		2,500		56		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Naphthalene	1,000		2,500		56		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Phenanthrene	1,000		2,500		40		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Pyrene	1,000		2,500		40		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Pesticides (mg/kg)																																																				
4,4'-DDD	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		0.0227		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
4,4'-DDE	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		0.0624		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		0.0652		0.00333	5		ND	U	0.00286	5
4,4'-DDT	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		0.0274		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		0.0496		0.00333	5		ND	U	0.00286	5
DDT (Total)	1.8	*	17	*	0.02	*	ND	U	0.00297	5		ND	U	0.00315	5		**0.1125**		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		**0.1148**		0.00333	5		ND	U	0.00286	5
Alachlor	7.7		72		0.4		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0396	5		ND	U	0.042	5		**0.254**		0.0363	5		**0.0768**		0.0346	5		ND	U	0.0379	5		ND	U	0.0374	5		ND	U	0.0418	5		**1.36**		0.036	5		ND	U	0.0444	5		**0.69**		0.0381	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00297	5		ND	U	0.00315	5		**0.0258**		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Endrin	20		610		0.4	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Herbicides (mg/kg)																																																			
Total Herbicides	NS		NS		NS		ND	U	0.0241	1		ND	U	0.0256	1		ND	U	0.0217	1		ND	U	0.0206	1		ND	U	0.0229	1		ND	U	0.0229	1		ND	U	0.0253	1		ND	U	0.0226	1		ND	U	0.0272	1		ND	U	0.0233	1
Polychlorinated Biphenyls (mg/kg)																																																			
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.417		0.03	1		0.326		0.0318	1		1.14		0.0275	1		0.112		0.0262	1		0.802		0.0287	1		0.346		0.0283	1		1.43		0.0317	1		11.6		0.273	10		5.16		0.168	5		7.03		0.289	10
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.0815		0.03	1		0.0553		0.0318	1		0.283		0.0275	1		0.0357		0.0262	1		0.0819		0.0287	1		0.039		0.0283	1		0.092		0.0317	1		1.16		0.273	10		0.396		0.168	5		0.786		0.289	10
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.03	1		ND	U	0.0318	1		ND	U	0.0275	1		ND	U	0.0262	1		ND	U	0.0287	1		ND	U	0.0283	1		ND	U	0.0317	1		ND	U	0.273	10		ND	U	0.168	5		ND	U	0.289	10
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.03	1		ND	U	0.0318	1		ND	U	0.0275	1		ND	U	0.0262	1		ND	U	0.0287	1		ND	U	0.0283	1		ND	U	0.0317	1		ND	U	0.273	10		ND	U	0.168	5		ND	U	0.289	10
Total PCBs	1		10		NS		0.498		0.03	1		0.381		0.0318	1		1.43		0.0275	1		0.147		0.0262	1		0.884		0.0287	1		0.385		0.0283	1		1.52		0.0317	1		12.8		0.273	10		5.56		0.168	5		7.81		0.289	10
Metals (mg/kg)																																																			
Antimony	27		8,200		NS		3.42		3.03	1		ND	U	3.22	1		10.1		2.76	1		3.41		2.63	1		ND	U	2.88	1		ND	U	2.88	1		ND	U	3.18	1		ND	U	2.84	1		4.35		3.43	1		34.4		2.93	1
Arsenic	10		10		NS		3.88		1.82	1		4.06		1.93	1		14		1.66	1		8.16		1.58	1		7.87		1.73	1		25.1		1.73	1		4.1		1.91	1		3.95		1.7	1		7.43		2.06	1		12.7		1.76	1
Barium	4,700		140,000		NS		284		3.03	1		290		3.22	1		1,360		2.76	1		773		2.63	1		126		2.88	1		120		2.88	1		193		3.18	1		301		2.84	1		464		3.43	1		660		2.93	1
Cadmium	34		1,000		NS		1.8		0.363	1		1.21		0.386	1		14.6		0.331	1		1.96		0.316	1		1.81		0.346	1		0.87		0.345	1		1.38		0.382	1		3.85		0.341	1		7.7		0.411	1		9.55		0.352	1
Chromium, Total	NS		NS		NS		88.1		0.605	1		68.6		0.643	1		419		0.552	1		181		0.527	1		47.3		0.576	1		59.7		0.576	1		93.4		0.637	1		118		0.568	1		167		0.686	1		174		0.586	1
Copper	2,500		76,000		NS		135		2.42	1		124		2.57	1		479		2.21	1		155		2.11	1		81.7		2.31	1		55		2.3	1		98		2.55	1		159		2.27	1		300		2.74	1		537		2.35	1
Lead	400		1,000		NS		201		0.605	1		136		0.643	1		2,000	B	0.552	1		519	B	0.527	1		141		0.576	1		62.9		0.576	1		159		0.637	1		232		0.568	1		1,830		0.686	1		5,890		0.586	1
Mercury	20		610		NS		0.11		0.0363	1		0.101		0.0386	1		1.64		0.0331	1		0.0925		0.0316	1		0.1		0.0346	1		0.0483		0.0345	1		0.0995		0.0382	1		0.129		0.0341	1		0.387		0.0411	1		0.583		0.0352	1
Nickel	1,400		7,500		NS		80.4		1.21	1		56.6		1.29	1		167		1.1	1		101		1.05	1		35.7		1.15	1		58.2		1.15	1		51.1		1.27	1		68		1.14	1		103		1.37	1		122		1.17	1
Silver	340		10,000		NS		ND	U	0.605	1		ND	U	0.643	1		1.96		0.552	1		ND	U	0.527	1		ND	U	0.576	1		ND	U	0.576	1		ND	U	0.637	1		ND	U	0.568	1		ND	U	0.686	1		1.06		0.586	1
Vanadium	470		14,000		NS		65.4		1.21	1		53.8		1.29	1		94.6		1.1	1		113		1.05	1		36.9		1.15	1		57.4		1.15	1		65.2		1.27	1		70.5		1.14	1		94		1.37	1		129		1.17	1
Zinc	20,000		610,000		NS		221		3.03	1		162		3.22	1		1,600		2.76	1		436		2.63	1		277	B	2.88	1		172	B	2.88	1		350	B	3.18	1		346	B	2.84	1		789	B	3.43	1		1,160	B	2.93	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-321A 8/18/2021 0.5-1 ft bg						SB-321B 8/18/2021 1.5-2 ft bg						SB-322A 8/18/2021 1-1.5 ft bg						SB-322B 8/18/2021 2.5-3 ft bg						SB-323A 8/18/2021 1.5-2 ft bg						SB-323B 8/18/2021 3-3.5 ft bg						SB-324A 8/18/2021 1-1.5 ft bg						SB-324B 8/18/2021 5-5.5 ft bg						SB-325A 8/18/2021 1-1.5 ft bg						SB-325B 8/18/2021 4.5-5 ft bg					
							Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF		
Volatile Organic Compounds (mg/kg)																																																										
Acetone	500		1,000		140		ND	U	0.013	1			ND	U	0.013	1			ND	U	0.012	1			ND	U	0.0083	1			ND	U	0.01	1			ND	U	0.011	1			ND	U	0.012	1			ND	U	0.0091	1			ND	U	0.01	1			ND	U	0.0091	1		
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			ND	U	0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			ND	U	0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Methylene Chloride	82		760		1		ND	U	0.013	1			ND	U	0.013	1			ND	U	0.012	1			ND	U	0.0083	1			ND	U	0.01	1			ND	U	0.011	1			ND	U	0.012	1			ND	U	0.0091	1			ND	U	0.01	1			ND	U	0.0091	1		
Naphthalene	1,000		2,500		56		ND	U	0.013	1			ND	U	0.013	1			ND	U	0.012	1			ND	U	0.0083	1			ND	U	0.01	1			ND	U	0.011	1			ND	U	0.012	1			ND	U	0.0091	1			ND	U	0.01	1			ND	U	0.0091	1		
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			0.0076		0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			ND	U	0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Trichloroethene (TCE)	56		520		1		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			0.012		0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			0.021		0.0052	1			0.02		0.0045	1		
Semi-Volatile Organic Compounds (mg/kg)																																																												
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Acenaphthylene	1,000		2,500		84		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Anthracene	1,000		2,500		400		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(a)anthracene	1		7.8		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(a)pyrene	1		1		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			0.621		0.562	2			ND	U	0.535	2		
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Chrysene	84	*	780	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Fluoranthene	1,000		2,500		56		ND	U	0.564	2			0.551		0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			0.853		0.562	2			ND	U	0.535	2		
Fluorene	1,000		2,500		56		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Naphthalene	1,000		2,500		56		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Phenanthrene	1,000		2,500		40		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Pyrene	1,000		2,500		40		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			0.675		0.562	2			ND	U	0.535	2		
Pesticides (mg/kg)																																																											
4,4'-DDD	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			0.0177		0.00262	5			0.2		0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			0.0112		0.00271	5			ND	U	0.00264	5		
4,4'-DDE	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			0.126		0.00272	5			ND	U	0.00271	5			0.095		0.00262	5			1.44		0.0142	25			0.0529		0.00279	5			ND	U	0.00279	5			0.0323		0.00271	5			ND	U	0.00264	5		
4,4'-DDT	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			0.0491		0.00272	5			ND	U	0.00271	5			0.0662		0.00262	5			1.01		0.0142	25			0.035		0.00279	5			ND	U	0.00279	5			0.0316		0.00271	5			ND	U	0.00264	5		
DDT (Total)	1.8	*	17	*	0.02	*	ND	U	0.00276	5			ND	U	0.00274	5			**0.1751**		0.00272	5			ND	U	0.00271	5			**0.1789**		0.00262	5			**2.65**		0.0142	25			**0.0879**		0.00279	5			ND	U	0.00279	5			**0.0751**		0.00271	5			ND	U	0.00264	5		
Alachlor	7.7		72		0.4		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Alpha Endosulfan	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Beta Endosulfan	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0368	5			ND	U	0.0365	5			ND	U	0.0362	5			ND	U	0.0361	5			**0.256**		0.035	5			**0.983**		0.19	25			**0.0865**		0.0372	5			ND	U	0.0373	5			**0.0676**		0.0362	5			ND	U	0.0351	5		
Dieldrin	0.038		0.36		0.007		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			**0.0176**		0.00262	5			ND	U	0.0142	25			0.00626		0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Endrin	20		610		0.4	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Herbicides (mg/kg)																																																											
Total Herbicides	NS		NS		NS		ND	U	0.0229	1			ND	U	0.022	1			ND	U	0.0219	1			ND	U	0.0218	1			ND	U	0.0214	1			ND	U	0.0233	1			ND	U	0.0228	1			ND	U	0.0224	1			ND	U	0.0224	1			ND	U	0.0215	1		
Polychlorinated Biphenyls (mg/kg)																																																										
PCB-1248 (Aroclor 1248)	NS		NS		NS		47.1		1.4	50			23.9		0.553	20			7.91		0.274	10			33.8		1.37	50			1.72		0.053	2			3.53		0.144	5			0.176		0.0282	1			ND	U	0.0282	1			0.322		0.0274	1			0.245		0.0266	1		
PCB-1260 (Aroclor 1260)	NS		NS		NS		4.01		1.4	50			2.42		0.553	20			0.634		0.274	10			2.79		1.37	50			0.222		0.053	2			1.94		0.144	5			0.0509		0.0282	1			ND	U	0.0282	1			0.193		0.0274	1			0.0439		0.0266	1		
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	1.4	50			ND	U	0.553	20			ND	U	0.274	10			ND	U	1.37	50			ND	U	0.053	2			ND	U	0.144	5			ND	U	0.0282	1			ND	U	0.0282	1			ND	U	0.0274	1			ND	U	0.0266	1		
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	1.4	50			ND	U	0.553	20			ND	U	0.274	10			ND	U	1.37	50			ND	U	0.053	2			ND	U	0.144	5			ND	U	0.0282	1			ND	U	0.0282	1			ND	U	0.0274	1			ND	U	0.0266	1		
Total PCBs	1		10		NS		51.1		1.4	50			26.3		0.553	20			8.54		0.274	10			36.6		1.37	50			1.94		0.053	2			5.46		0.144	5			0.227		0.0282	1			ND	U	0.0282	1			0.515		0.0274	1			0.289		0.0266	1		
Metals (mg/kg)																																																										
Antimony	27		8,200		NS		4.02		2.87	1			3.39		2.79	1			ND	U	2.78	1			4		2.76	1			ND	U	2.69	1			15		2.95	1			ND	U	2.89	1			ND	U	2.85	1			8.51		2.84	1			ND	U	2.73	1		
Arsenic	10		10		NS		7.41		1.72	1			9.74		1.67	1			7.69		1.67	1			11.1		1.66	1			6.18		1.61	1			16.7		1.77	1			6.49		1.73	1			3.83		1.71	1			12.5		1.7	1			5.01		1.64	1		
Barium	4,700		140,000		NS		472		2.87	1			599		2.79	1			231		2.78	1			574		2.76	1			266		2.69	1			1,610		2.95	1			609		2.89	1			77.1		2.85	1			578		2.84	1			304		2.73	1		
Cadmium	34		1,000		NS		8.11		0.345	1			9.35		0.335	1			1.76		0.334	1			10.8		0.331	1			2.25		0.323	1			18.4		0.354	1			4.74		0.347	1			ND	U	0.342	1			4.59		0.34	1			7.42		0.327	1		
Chromium, Total	NS		NS		NS		163		0.575	1			167		0.558	1			85.8		0.557	1			176		0.552	1			105		0.538	1			763		0.59	1			95.8		0.578	1			47.5		0.57	1			343		0.567	1			115		0.546	1		
Copper	2,500		76,000		NS		282		2.3	1			332		2.23	1			74.6		2.23	1			417		2.21	1			82.7		2.15	1			518		2.36	1			423		2.31	1			19.5		2.28	1			397		2.27	1			87.4		2.18	1		
Lead	400		1,000		NS		676	B	0.575	1			808	B	0.558	1			181	B	0.557	1			648	B	0.552	1			154		0.538	1			1,660	B	0.59	1			898		0.578	1			8.2		0.57	1			2,650		0.567	1			128		0.546	1		
Mercury	20		610		NS		0.352		0.0345	1			0.346		0.0335	1			0.11		0.0334	1			0.175		0.0331	1			0.321		0.0323	1			2.94		0.0354	1			0.496		0.0347	1			0.0363		0.0342	1			1.61		0.034	1			0.0739		0.0327	1		
Nickel	1,400		7,500		NS		96.9		1.15	1			102		1.12	1			47.8		1.11	1			103		1.1	1			52.1		1.08	1			322		1.18	1			68.2		1.16	1			25.1		1.14	1			135		1.13	1			70.8		1.09	1		
Silver	340		10,000		NS		ND	U	0.575	1			ND	U	0.558	1			ND	U	0.557	1			0.756		0.552	1			ND	U	0.538	1			4.01		0.59	1			1.05		0.578	1			ND	U	0.57	1			2.73		0.567	1			ND	U	0.546	1		
Vanadium	470		14,000		NS		73.4		1.15	1			81.9		1.12	1			66.4		1.11	1			80.3		1.1	1			67.3		1.08	1			114		1.18	1			83.1		1.16	1			48.8		1.14	1			106		1.13	1			91		1.09	1		
Zinc	20,000		610,000		NS		979		2.87	1			787		2.79	1			210		2.78	1			807		2.76	1			201		2.69	1			1,730		2.95	1			1,050		2.89	1			34.9		2.85	1			722		2.84	1			313		2.73	1		

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-326A 8/18/2021 1.5-2 ft bg				SB-326B 8/18/2021 3-3.5 ft bg				SB-327A 8/18/2021 2-2.5 ft bg				SB-327B 8/18/2021 5-5.5 ft bg				SB-328A 8/18/2021 1-1.5 ft bg				SB-328B 8/18/2021 2.5-3 ft bg				SB-329A 8/18/2021 2-2.5 ft bg				SB-329B 8/18/2021 4-4.5 ft bg				SB-330A 8/18/2021 0.5-1 ft bg				SB-330B 8/18/2021 2-3 ft bg				SB-330B 8/18/2021 DUP-SO2 2-3 ft bg			
							Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																																
Acetone	500		1,000		140		ND	U	0.011	1	ND	U	0.012	1	ND	U	0.013	1	0.052		0.01	1	ND	U	0.0095	1	ND	U	0.012	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.011	1	ND	U	0.0098	1
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0055	1	ND	U	0.0059	1	0.037		0.0066	1	ND	U	0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0055	1	ND	U	0.0059	1	ND	U	0.0066	1	0.0073		0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Methylene Chloride	82		760		1		ND	U	0.011	1	ND	U	0.012	1	ND	U	0.013	1	ND	U	0.01	1	ND	U	0.0095	1	0.046	B	0.012	1	ND	U	0.011	1	0.022	B	0.01	1	ND	U	0.01	1	0.022	B	0.011	1	ND	U	0.0098	1
Naphthalene	1,000		2,500		56		ND	U	0.011	1	ND	U	0.012	1	ND	U	0.013	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.0095	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.011	1	ND	U	0.0098	1
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0055	1	ND	U	0.0059	1	0.026		0.0066	1	ND	U	0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0055	1	ND	U	0.0059	1	0.012		0.0066	1	ND	U	0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Trichloroethene (TCE)	56		520		1		ND	U	0.0055	1	0.037		0.0059	1	0.23		0.0066	1	0.03		0.005	1	0.012		0.0047	1	0.0085		0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Semi-Volatile Organic Compounds (mg/kg)																																																	
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Acenaphthylene	1,000		2,500		84		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Anthracene	1,000		2,500		400		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(a)anthracene	1		7.8		1		0.942		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(a)pyrene	1		1		1		0.807		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(b)fluoranthene	1		7.8		1		0.701		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(k)fluoranthene	8.4		78		1		0.642		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Chrysene	84	*	780	*	1	*	0.771		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Fluoranthene	1,000		2,500		56		1.8		0.518	2	0.686		0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	0.751		0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Fluorene	1,000		2,500		56		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	0.593		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Naphthalene	1,000		2,500		56		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Phenanthrene	1,000		2,500		40		1.43		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Pyrene	1,000		2,500		40		1.38		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	0.654		0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Pesticides (mg/kg)																																																	
4,4'-DDD	NS		NS		NS		0.0166		0.00261	5	0.0894		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	0.0713		0.00263	5	0.0282		0.00295	5	0.0507		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
4,4'-DDE	NS		NS		NS		0.0717		0.00261	5	0.375		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	0.317		0.00263	5	0.142		0.00295	5	0.2		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
4,4'-DDT	NS		NS		NS		0.0653		0.00261	5	0.408		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	0.349		0.00263	5	0.158		0.00295	5	0.129		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
DDT (Total)	1.8	*	17	*	0.02	*	**0.1536**		0.00261	5	**0.8724**		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	**0.7373**		0.00263	5	**0.3282**		0.00295	5	**0.3797**		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Alachlor	7.7		72		0.4		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0349	5	**0.619**		0.035	5	**0.189**		0.0393	5	ND	U	0.0354	5	ND	U	0.035	5	ND	U	0.0393	5	**0.454**		0.0369	5	ND	U	0.0376	5	ND	U	0.0377	5	ND	U	0.0408	5	ND	U	0.0395	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00261	5	**0.0397**		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	**0.0445**		0.00263	5	**0.0211**		0.00295	5	**0.0438**		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Endrin	20		610		0.4	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Herbicides (mg/kg)																																																
Total Herbicides	NS		NS		NS		ND	U	0.0206	1	ND	U	0.0215	1	ND	U	0.0241	1	ND	U	0.0215	1	ND	U	0.0213	1	ND	U	0.0237	1	ND	U	0.022	1	ND	U	0.0228	1	ND	U	0.0225	1	ND	U	0.0249	1	ND	U	0.0239	1
Polychlorinated Biphenyls (mg/kg)																																																
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.374		0.0264	1	2.14		0.133	5	1.24		0.0298	1	ND	U	0.0268	1	1.6		0.0531	2	0.343		0.0298	1	0.834		0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	0.0571		0.0299	1
PCB-1260 (Aroclor 1260)	NS		NS		NS		ND	U	0.0264	1	ND	U	0.0133	5	ND	U	0.0298	1	ND	U	0.0268	1	0.598		0.0531	2	0.122		0.0298	1	0.183		0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	ND	U	0.0299	1
PCB-1262 (Aroclor 1262)	NS		NS		NS		0.363		0.0264	1	1.16		0.133	5	0.804		0.0298	1	ND	U	0.0268	1	ND	U	0.0531	2	ND	U	0.0298	1	ND	U	0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	ND	U	0.0299	1
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0264	1	ND	U	0.133	5	ND	U	0.0298	1	ND	U	0.0268	1	ND	U	0.0531	2	ND	U	0.0298	1	ND	U	0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	ND	U	0.0299	1
Total PCBs	1		10		NS		0.736		0.0264	1	3.3		0.133	5	2.05		0.0298	1	ND	U	0.0268	1	2.19		0.0531	2	0.465		0.0298	1	1.02		0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	0.0571		0.0299	1
Metals (mg/kg)																																																
Antimony	27		8,200		NS		3.23		2.65	1	ND	U	2.69	1	ND	U	3.04	1	ND	U	2.71	1	ND	U	2.73	1	ND	U	3.01	1	ND	U	2.81	1	ND	U	2.89	1	ND	U	2.87	1	ND	U	3.12	1	ND	U	3.02	1
Arsenic	10		10		NS		6.4		1.59	1	53.1		1.62	1	17.5		1.82	1	2.6		1.63	1	14		1.64	1	9.85		1.81	1	4.61		1.69	1	4.67		1.74	1	5.36		1.72	1	6.52		1.87	1	4.84		1.81	1
Barium	4,700		140,000		NS		199		2.65	1	1,370		2.69	1	1,640		3.04	1	616		2.71	1	810		2.73	1	412		3.01	1	180		2.81	1	160		2.89	1	215		2.87	1	173		3.12	1	174		3.02	1
Cadmium	34		1,000		NS		0.906		0.318	1	14.6		0.323	1	8.25		0.365	1	0.439		0.325	1	14.3		0.328	1	5.65		0.361	1	0.472		0.337	1	ND	U	0.347	1	0.468		0.345	1	ND	U	0.375	1	ND	U	0.362	1
Chromium, Total	NS		NS		NS		77.2		0.531	1	219		0.539	1	164		0.608	1	128		0.542	1	287		0.547	1	136		0.602	1	63.3		0.562	1	71.2		0.578	1	97.9		0.575	1	91.9		0.624	1	104		0.604	1
Copper	2,500		76,000		NS		68.9		2.12	1	1,110		2.16	1	938		2.43	1	44.7		2.17	1	483		2.19	1	485		2.41	1	35.7		2.25	1	28.1		2.31	1	31.6		2.3	1	25.8		2.5	1	24.5		2.41	1
Lead	400		1,000		NS		207		0.531	1	2,230		0.539	1	2,020		0.608	1	31.9		0.542	1	701		0.547	1	663		0.602	1	57.5		0.562	1	14		0.578	1	39.4		0.575	1	33.8		0.624	1	18.7	B	0.604	1
Mercury	20		610		NS		0.201		0.0318	1	0.508		0.0323	1	ND	U	0.0365	1	0.0452		0.0325	1	1.4		0.0328	1	ND	U	0.0361	1	0.493		0.0337	1	ND	U	0.0347	1	0.0754		0.0345	1	0.072		0.0375	1	0.0605		0.0362	1
Nickel	1,400		7,500		NS		41.6		1.06	1	215		1.08	1	207		1.22	1	74		1.08	1	169		1.09	1	101		1.2	1	35.4		1.12	1	36.3		1.16	1	49		1.15	1	46.9		1.25	1	50.1		1.21	1
Silver	340		10,000		NS		ND	U	0.531	1	3.09		0.539	1	4		0.608	1	ND	U	0.542	1	ND	U	0.547	1	0.627		0.602	1	ND	U	0.562	1	ND	U	0.578	1	ND	U	0.575	1	ND	U	0.624	1	ND	U	0.604	1
Vanadium	470		14,000		NS		67.9		1.06	1	56.1		1.08	1	82.8		1.22	1	92		1.08	1	111		1.09	1	67		1.2	1	52.8		1.12	1	60		1.16	1	63.6		1.15	1	70.4		1.25	1	74.1		1.21	1
Zinc	20,000		610,000		NS		182		2.65	1	2,970		2.69	1	2,070		3.04	1	114		2.71	1	1,350		2.73	1	620		3.01	1	100		2.81	1	49.1		2.89	1	90.3		2.87	1	69.1		3.12	1	70.6		3.02	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-331A 8/18/2021 2-2.5 ft bg					SB-331B 8/18/2021 4-4.5 ft bg					SB-332A 8/18/2021 0.5-1 ft bg					SB-332B 8/18/2021 2-3.5 ft bg				
							Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF	
Volatile Organic Compounds (mg/kg)																										
Acetone	500		1,000		140		ND	U	0.01	1		ND	U	0.0096	1		ND	U	0.0098	1		ND	U	0.011	1	
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0052	1		ND	U	0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0052	1		ND	U	0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Methylene Chloride	82		760		1		0.028	B	0.01	1		ND	U	0.0096	1		ND	U	0.0098	1		0.013	B	0.011	1	
Naphthalene	1,000		2,500		56		ND	U	0.01	1		ND	U	0.0096	1		ND	U	0.0098	1		ND	U	0.011	1	
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0052	1		0.0059		0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0052	1		ND	U	0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Trichloroethene (TCE)	56		520		1		0.0063		0.0052	1		0.01		0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Semi-Volatile Organic Compounds (mg/kg)																										
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Acenaphthylene	1,000		2,500		84		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Anthracene	1,000		2,500		400		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(a)anthracene	1		7.8		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(a)pyrene	1		1		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Chrysene	84	*	780	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Fluoranthene	1,000		2,500		56		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Fluorene	1,000		2,500		56		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Naphthalene	1,000		2,500		56		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Phenanthrene	1,000		2,500		40		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Pyrene	1,000		2,500		40		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Pesticides (mg/kg)																										
4,4'-DDD	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
4,4'-DDE	NS		NS		NS		0.0854		0.00282	5		ND	U	0.00268	5		0.00732		0.00264	5		ND	U	0.00261	5	
4,4'-DDT	NS		NS		NS		0.0317		0.00282	5		ND	U	0.00268	5		0.00994		0.00264	5		ND	U	0.00261	5	
DDT (Total)	1.8	*	17	*	0.02	*	**0.1171**		0.00282	5		ND	U	0.00268	5		0.01726		0.00264	5		ND	U	0.00261	5	
Alachlor	7.7		72		0.4		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Alpha Endosulfan	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Beta Endosulfan	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Chlordane (alpha and gamma)	0.49		2.2		0.066		**0.0863**		0.0376	5		ND	U	0.0357	5		ND	U	0.0352	5		ND	U	0.0348	5	
Dieldrin	0.038		0.36		0.007		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Endrin	20		610		0.4	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Herbicides (mg/kg)																										
Total Herbicides	NS		NS		NS		ND	U	0.0228	1		ND	U	0.0218	1		ND	U	0.0213	1		ND	U	0.021	1	
Polychlorinated Biphenyls (mg/kg)																										
PCB-1248 (Aroclor 1248)	NS		NS		NS		ND	U	0.0285	1		ND	U	0.027	1		0.369		0.0267	1		0.0378		0.0264	1	
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.0519		0.0285	1		ND	U	0.027	1		0.0671		0.0267	1		ND	U	0.0264	1	
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.0285	1		ND	U	0.027	1		ND	U	0.0267	1		ND	U	0.0264	1	
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0285	1		ND	U	0.027	1		ND	U	0.0267	1		ND	U	0.0264	1	
Total PCBs	1		10		NS		0.0519		0.0285	1		ND	U	0.027	1		0.436		0.0267	1		0.0378		0.0264	1	
Metals (mg/kg)																										
Antimony	27		8,200		NS		ND	U	2.89	1		3.28		2.74	1		ND	U	2.68	1		ND	U	2.68	1	
Arsenic	10		10		NS		14.1		1.73	1		7.59		1.65	1		4.09		1.61	1		4.69		1.61	1	
Barium	4,700		140,000		NS		857		2.89	1		453		2.74	1		175		2.68	1		338		2.68	1	
Cadmium	34		1,000		NS		7.82		0.347	1		0.991		0.329	1		0.463		0.322	1		ND	U	0.321	1	
Chromium, Total	NS		NS		NS		115		0.578	1		151		0.549	1		51.9		0.536	1		127		0.535	1	
Copper	2,500		76,000		NS		1,210		2.31	1		134		2.19	1		57.6		2.14	1		48.7		2.14	1	
Lead	400		1,000		NS		1,250		0.578	1		126		0.549	1		50.8		0.536	1		44.7		0.535	1	
Mercury	20		610		NS		2.19		0.0347	1		0.0589		0.0329	1		0.0856		0.0322	1		ND	U	0.0321	1	
Nickel	1,400		7,500		NS		108		1.16	1		77.6		1.1	1		31.4		1.07	1		58.7		1.07	1	
Silver	340		10,000		NS		1.44		0.578	1		ND	U	0.549	1		ND	U	0.536	1		ND	U	0.535	1	
Vanadium	470		14,000		NS		61.2		1.16	1		90		1.1	1		45		1.07	1		93.8		1.07	1	
Zinc	20,000		610,000		NS		1,330		2.89	1		203		2.74	1		97.7		2.68	1		90.4		2.68	1	

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9A
March 2022 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-333	SB-334	SB-335	SB-336	SB-337	SB-338	SB-339	SB-340	DUP-2_021822 / SB-340	SB-341	SB-342	SB-343
				02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022
				1.5-2	0.75-1.25	0.5-1	0-1	0.5-1	1.25-1.75	0.25-0.75	1-1.5	1-1.5	0.5-1.5	1-2	0-1
				Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (mg/kg)															
1,2-Dibromoethane (Ethylene Dibromide)	0.007	0.067	0.1	<0.0056 U	<0.005 U	<0.012 U	<0.0082 U	<0.0099 U	<0.0057 U	<0.0086 U	<0.0059 U	<0.0063 U	<0.0052 U	<0.0066 U	<0.0081 U
Acetone	500	1000	140	<0.011 UJ	<0.01 UJ	0.033 J	<0.016 UJ	<0.02 UJ	<0.011 UJ	<0.017 UJ	<0.012 UJ	<0.013 UJ	<0.01 UJ	0.046 J	0.017 J
Methylene Chloride	82	760	1	<0.011 U	<0.01 U	0.03	<0.016 U	0.04	<0.011 U	<0.017 U	0.077 J	0.016 J	<0.01 U	0.05	<0.016 U
Trichloroethene (TCE)	56	520	1	<0.0056 U	<0.005 U	<0.012 U	<0.0082 U	<0.0099 U	<0.0057 U	<0.0086 U	<0.0059 U	<0.0063 U	0.01	<0.0066 U	<0.0081 U
Semi-Volatile Organic Compounds (mg/kg)															
Benzo(a)anthracene	1	7.8	1	<0.557 U	**1.38**	<0.685 U	0.711	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(a)pyrene	1	1	1	<0.557 U	**1.06**	<0.685 U	0.899	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(b)fluoranthene	1	7.8	1	<0.557 U	**1.01**	<0.685 U	0.797	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(g,h,i)Perylene	8.4 *	78 *	1 *	<0.557 U	0.658	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(k)fluoranthene	8.4	78	1	<0.557 U	0.999	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Chrysene	84 *	780 *	1 *	<0.557 U	1.15	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Fluoranthene	1000	2500	56	<0.557 UJ	2.47 J	<0.685 U	1.1	0.803	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Indeno(1,2,3-cd)pyrene	1 *	7.8 *	1 *	<0.557 U	0.831	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Phenanthrene	1000	2500	40	<0.557 UJ	1.59 J	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Pyrene	1000	2500	40	<0.557 U	2.09	<0.685 U	0.842	0.778	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Petroleum Hydrocarbons (mg/kg)															
Total Extractable Petroleum Hydrocarbons	500	2500	2500	<42.1 U	<46.7 U	<54.8 U	71.2	102	<45.7 U	<49.5 U	<48.2 U	65.4	<46 U	<48.5 U	<49.1 U
Pesticides (mg/kg)															
4,4'-DDD	NS	NS	NS	<0.00268 U	<0.0029 U	<0.00336 UJ	0.0473 J	0.0108 J	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
4,4'-DDE	NS	NS	NS	<0.00268 U	<0.0029 U	<0.00336 UJ	0.0134 J	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
4,4'-DDT	1.8 *	17 *	0.02 *	<0.00268 U	<0.0029 U	<0.00336 UJ	0.348 J	0.0619 J	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
Chlordane (alpha and gamma)	0.49	2.2	0.066	<0.0357 U	<0.0387 U	<0.0448 UJ	0.135 J	<0.0452 UJ	<0.039 U	<0.0427 U	<0.0413 U	<0.0416 U	<0.0397 U	<0.0427 U	<0.0431 UJ
Dieldrin	0.038	0.36	0.007	<0.00268 U	<0.0029 U	<0.00336 UJ	<0.00349 UJ	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
Heptachlor	0.14	1.3	0.013	<0.00268 U	<0.0029 U	<0.00336 UJ	<0.00349 UJ	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
Heptachlor Epoxide	0.067	0.63	0.02	<0.00268 U	<0.0029 U	<0.00336 UJ	<0.00349 UJ	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	**0.076 J**
Herbicides (mg/kg)															
Dalapon	NS	NS	NS	0.105	0.0754	0.0731	0.182	0.164	<0.0239 U	0.0927	0.171	0.203	0.123	0.143	0.0936
Polychlorinated Biphenyl (mg/kg)															
PCB-1248 (Aroclor 1248)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	0.8	<0.0342 UJ	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	0.587 J	0.741
PCB-1254 (Aroclor 1254)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	<0.0352 U	0.136 J	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	<0.0324 UJ	<0.0326 U
PCB-1260 (Aroclor 1260)	NS	NS	NS	<0.0271 U	0.0309	<0.0339 UJ	0.25	0.0757 J	<0.0295 U	<0.0323 UJ	0.0513	<0.0315 U	<0.0301 U	0.069 J	0.125 J
PCB-1262 (Aroclor 1262)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	<0.0352 U	<0.0342 UJ	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	<0.0324 UJ	<0.0326 U
PCB-1268 (Aroclor 1268)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	<0.0352 U	<0.0342 UJ	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	<0.0324 UJ	<0.0326 U
Total PCBs	1	10	NS	<0.0271 U	0.0309	<0.0339 UJ	**1.05**	0.212 J	<0.0295 U	<0.0323 UJ	0.0513	<0.0315 U	<0.0301 U	0.657 J	0.866
Metals (mg/kg)															
Antimony	27	8200	NS	7.12	11.4	8.59	17.3	21.8	9	8.36	9.91	10.2	9.85	18.5 J	9.29
Arsenic	10	10	NS	<1.69 U	<1.77 U	3.31	8.84	**12.6**	1.88	4.35	6.34	3.16	2.41	3.68	3.06
Barium	4700	140000	NS	207 J	322 J	171	1,430	1,040	99.7	120	247	223	611	1,260 J	204
Cadmium	34	1000	NS	<0.338 U	1.71	0.788	17.5	10.4	<0.36 U	<0.39 U	1.51	1.12	1.99	2.85 J	1.99
Chromium, Total	NS	NS	NS	53.8	110	79	234	217	65.8	54.4	111	106	120	426 J	93.7
Copper	2500	76000	NS	37.7 J	204 J	67.8	1,500	1,740	23.5	47.4	186 J	85.1 J	136	202 J	98.1
Lead	400	1000	NS	51	389	167	**2,800**	**2,000**	9.93	136	269	196	256	**1,570 J**	214
Mercury	20	610	NS	<0.0338 U	0.157	0.186	1.18	0.572	0.0393	0.159	0.915 J	0.29 J	0.217	0.269	0.165
Nickel	1400	7500	NS	32.9 J	60 J	25.9	204	156	20.2	22.1	52.4	46.1	37.7	44.2 J	34.9 J
Silver	340	10000	NS	0.935	<0.699 U	2.35	3.08	1.02	1.8	1.51	1.58	1.67	0.953	<0.661 UJ	1.76
Vanadium	470	14000	NS	57.8	65.1	63.2	180	81	57.7	51.5	68.8	69.6	61.8	67.6	65.8
Zinc	20000	610000	NS	69.3	253	131	2,410	2,060	47.7	134	291	216	308	903 J	275

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting

Qualifiers:
R – The sample results are unusable because certain criteria were not met when generating the data. The analyte may or may not be present in the sample.
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate or
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9A
March 2022 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	DUP-1_021822 / SB-343 02/18/2022 0-1 Result	SB-344A 02/18/2022 0.5-1 Result	SB-344B 02/18/2022 1-1.4 Result	SB-345 02/18/2022 1-2 Result	SB-346 02/18/2022 0.5-1.5 Result	SB-347 02/18/2022 0.5-1.25 Result	SB-348 02/18/2022 1-2 Result	SB-349 02/18/2022 0.5-1.25 Result	SB-350 02/18/2022 0.25-0.75 Result	SB-351 02/18/2022 1-1.5 Result	SB-352A 02/18/2022 0.5-1 Result	SB-352B 02/18/2022 1.25-1.5 Result
Volatile Organic Compounds (mg/kg)															
1,2-Dibromoethane (Ethylene Dibromide)	0.007	0.067	0.1	<0.0063 U	<0.0068 U	<0.0077 U	<0.0062 U	<0.0067 U	<0.0069 U	<0.007 U	<0.0064 U	<0.0061 U	<0.006 U	<0.0063 U	<0.0049 U
Acetone	500	1000	140	0.02 J	<0.014 UJ	<0.015 UJ	<0.012 UJ	<0.013 UJ	<0.014 UJ	<0.014 UJ	<0.013 UJ	<0.012 UJ	<0.012 UJ	<0.013 UJ	<0.0098 UJ
Methylene Chloride	82	760	1	0.015	0.048	0.044	<0.012 U	<0.013 U	<0.014 U	<0.014 U	<0.013 U	<0.012 U	<0.012 U	<0.013 U	<0.0098 U
Trichloroethene (TCE)	56	520	1	<0.0063 U	<0.0068 U	<0.0077 U	<0.0062 U	<0.0067 U	<0.0069 U	<0.007 U	<0.0064 U	<0.0061 U	<0.006 U	<0.0063 U	<0.0049 U
Semi-Volatile Organic Compounds (mg/kg)															
Benzo(a)anthracene	1	7.8	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.748	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(a)pyrene	1	1	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.832	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(b)fluoranthene	1	7.8	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.745	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(g,h,i)Perylene	8.4 *	78 *	1 *	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	<0.597 U	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(k)fluoranthene	8.4	78	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.739	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Chrysene	84 *	780 *	1 *	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.717	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Fluoranthene	1000	2500	56	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	1.66 J	<0.642 U	<0.66 UJ	<0.638 U	<0.579 UJ	<0.572 UJ
Indeno(1,2,3-cd)pyrene	1 *	7.8 *	1 *	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.636	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Phenanthrene	1000	2500	40	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.684 J	<0.642 U	<0.66 UJ	<0.638 U	<0.579 UJ	<0.572 UJ
Pyrene	1000	2500	40	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	1.26	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Petroleum Hydrocarbons (mg/kg)															
Total Extractable Petroleum Hydrocarbons	500	2500	2500	<51.5 U	51.9	<53.4 U	97.5	103	117	199	<48.5 U	<50.5 U	<50.3 U	188	73.5
Pesticides (mg/kg)															
4,4'-DDD	NS	NS	NS	<0.00325 U	<0.00331 U	<0.00326 U	<0.00287 U	0.0438	<0.00324 UJ	0.0192	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
4,4'-DDE	NS	NS	NS	<0.00325 U	<0.00331 U	0.0387	0.00646	<0.00305 U	<0.00324 UJ	0.0253	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
4,4'-DDT	1.8 *	17 *	0.02 *	<0.00325 U	0.00501	0.00405	<0.00287 U	0.0578	<0.00324 UJ	0.131	<0.00322 U	<0.0033 U	<0.00316 U	0.00643	<0.00282 U
Chlordane (alpha and gamma)	0.49	2.2	0.066	<0.0433 U	<0.0441 U	<0.0434 U	<0.0382 U	<0.0407 U	<0.0432 UJ	0.219	<0.043 U	<0.044 U	<0.0421 U	0.0419	<0.0376 U
Dieldrin	0.038	0.36	0.007	<0.00325 U	0.0181	0.0164	<0.00287 U	0.015	<0.00324 UJ	<0.00295 U	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
Heptachlor	0.14	1.3	0.013	<0.00325 U	<0.00331 U	0.0367	<0.00287 U	<0.00305 U	<0.00324 UJ	<0.00295 U	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
Heptachlor Epoxide	0.067	0.63	0.02	<0.00325 UJ	<0.00331 U	<0.00326 U	<0.00287 U	<0.00305 U	<0.00324 UJ	0.0141	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
Herbicides (mg/kg)															
Dalapon	NS	NS	NS	0.154	0.15	0.135	0.111	0.0431	0.0563	0.123	<0.0258 U	<0.0263 U	0.321	0.327	0.231
Polychlorinated Biphenyl (mg/kg)															
PCB-1248 (Aroclor 1248)	NS	NS	NS	0.708	3.12	3.89 J	0.551	0.458	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1254 (Aroclor 1254)	NS	NS	NS	<0.0328 U	<0.167 U	<0.165 UJ	<0.029 U	<0.0308 U	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1260 (Aroclor 1260)	NS	NS	NS	0.0583 J	0.248 J	0.267 J	0.0551	<0.0308 U	<0.0327 UJ	0.0558 J	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1262 (Aroclor 1262)	NS	NS	NS	<0.0328 U	<0.167 U	<0.165 UJ	<0.029 U	0.73	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1268 (Aroclor 1268)	NS	NS	NS	<0.0328 U	<0.167 U	<0.165 UJ	<0.029 U	0.451	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
Total PCBs	1	10	NS	0.766	**3.36**	**4.16 J**	0.606	**1.64**	<0.0327 UJ	0.0558 J	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
Metals (mg/kg)															
Antimony	27	8200	NS	10.2	7.84	12	11.1	13.2	<3.29 U	3.1 J	7.72	6.71	7.62	5.59	5.66
Arsenic	10	10	NS	4.22	4.41	6.76	**15.2**	**14**	5.21	2.91	2.71	2.52	**23**	**14.1**	6.48
Barium	4700	140000	NS	250	154	310	389	653	101	113 J	167	199 J	289	250 J	175 J
Cadmium	34	1000	NS	1.98	2.17	4.19	3.96	11.6	0.481	1.18	0.881	1.04	1.5	0.441	0.458
Chromium, Total	NS	NS	NS	90.5	108	174	147	328	18.6	37.3 J	73.8	74	54.3	42.4	41.2
Copper	2500	76000	NS	89.2	133	271	194	**4,950**	457	103 J	62	143 J	75.4	46 J	46.8 J
Lead	400	1000	NS	199	202	**431**	297	**724**	100	338	75.4	171	111	67.4	85.1
Mercury	20	610	NS	0.218	0.222	0.22	0.261	0.375	0.364	0.39	0.0808	0.188	0.146	0.104	0.114
Nickel	1400	7500	NS	81.2 J	31.4	67.4	77.4	153	13.9	30.1 J	33.8	31.9 J	18	25.1 J	27.2 J
Silver	340	10000	NS	2.45	1.21	1.91	1.12	3.02	3.79	1.36 J	1.63	0.811	1.11	0.869	1.05
Vanadium	470	14000	NS	74.8	49.9	78	62.9	58.1	39.5	35.8	54.8	42.9	52.8	54.7	55.7
Zinc	20000	610000	NS	236	246	396	373	679	123	236 J	143	187	515	247	154

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting

Qualifiers:
R – The sample results are unusable because certain criteria were not met when generating the data. The analyte may or may not be present in the sample.
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U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9A
March 2022 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-353	SB-354	SB-355	SB-356	SB-357	SB-358	SB-359	SB-360
				02/18/2022	02/18/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
				0-0.5	0.5-1	0.75-1.25	0-1	0.5-1	0.5-1.25	0.5-1.5	0.5-1.25
				Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (mg/kg)											
1,2-Dibromoethane (Ethylene Dibromide)	0.007	0.067	0.1	<0.0046 U	<0.005 U	NA	NA	NA	NA	NA	NA
Acetone	500	1000	140	<0.0092 UJ	<0.0099 UJ	NA	NA	NA	NA	NA	NA
Methylene Chloride	82	760	1	<0.0092 U	0.039	NA	NA	NA	NA	NA	NA
Trichloroethene (TCE)	56	520	1	<0.0046 U	<0.005 U	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds (mg/kg)											
Benzo(a)anthracene	1	7.8	1	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	0.677
Benzo(a)pyrene	1	1	1	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Benzo(b)fluoranthene	1	7.8	1	0.587	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Benzo(g,h,i)Perylene	8.4 *	78 *	1 *	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Benzo(k)fluoranthene	8.4	78	1	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Chrysene	84 *	780 *	1 *	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	0.608	0.654
Fluoranthene	1000	2500	56	0.975	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	1.21	1.69
Indeno(1,2,3-cd)pyrene	1 *	7.8 *	1 *	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Phenanthrene	1000	2500	40	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	1.1
Pyrene	1000	2500	40	0.695	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	1.22	1.7
Petroleum Hydrocarbons (mg/kg)											
Total Extractable Petroleum Hydrocarbons	500	2500	2500	54.4	<48.3 U	NA	NA	NA	NA	NA	NA
Pesticides (mg/kg)											
4,4'-DDD	NS	NS	NS	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
4,4'-DDE	NS	NS	NS	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
4,4'-DDT	1.8 *	17 *	0.02 *	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Chlordane (alpha and gamma)	0.49	2.2	0.066	<0.0374 U	<0.0424 UJ	NA	NA	NA	NA	NA	NA
Dieldrin	0.038	0.36	0.007	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Heptachlor	0.14	1.3	0.013	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	0.067	0.63	0.02	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Herbicides (mg/kg)											
Dalapon	NS	NS	NS	0.0254	0.046	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyl (mg/kg)											
PCB-1248 (Aroclor 1248)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	0.108	0.302	0.302 J
PCB-1254 (Aroclor 1254)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	<0.0302 U	<0.0306 U
PCB-1260 (Aroclor 1260)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	0.0871	0.167
PCB-1262 (Aroclor 1262)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	<0.0302 U	<0.0306 U
PCB-1268 (Aroclor 1268)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	<0.0302 U	<0.0306 U
Total PCBs	1	10	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	0.108	0.389	0.47
Metals (mg/kg)											
Antimony	27	8200	NS	5.47	7.59	NA	10.8	10.3	7.3	6.38	4.81
Arsenic	10	10	NS	<1.72 U	4.24	NA	3.37	2.88	4.18	2.11	9.01
Barium	4700	140000	NS	115	151	NA	158	150	180	228	192
Cadmium	34	1000	NS	<0.344 U	0.494	NA	<0.386 U	<0.387 U	0.532	1.13	2.46
Chromium, Total	NS	NS	NS	32.4	55.8	NA	89.8	81.7	67.9	42.2	63.5
Copper	2500	76000	NS	31.9	46.2	NA	25.2 J	27.8 J	49.6 J	180 J	112 J
Lead	400	1000	NS	37.5	95.5	NA	72.1	56.5	85.6	299	223
Mercury	20	610	NS	0.108	0.222	NA	0.0943	0.139	0.0713	0.175	0.27
Nickel	1400	7500	NS	8.44	15.6	NA	48.6 J	51.6 J	44.4 J	41.5 J	44.1 J
Silver	340	10000	NS	1.43	1.31	NA	0.697	0.991	<0.621 U	0.732	0.691
Vanadium	470	14000	NS	38.3	53	NA	64.7	69.6	50.3	31.6	45.1
Zinc	20000	610000	NS	90.2	175	NA	109	203	197	333	328

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting

Qualifiers:
R – The sample results are unusable because certain criteria were not met when generating the data. The analyte may or may not be present in the sample.
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate or
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9B
March 2022 Groundwater Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Groundwater Volatilization Criteria	Surface Water Protection Criteria	MW-1	MW-05	MW-08	MW-09	DUP-GW_031122 MW-09	MW-10
			03/11/2022	3/15/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
			Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (ug/L)								
1,2,4-Trimethylbenzene	940 *	150 *	<0.5 U	1.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-Dibromoethane (Ethylene Dibromide)	0.3	NS	*<0.5 U*	*<0.5 U*	*<0.5 U*	*<0.5 U*	*<0.5 U*	*<0.5 U*
Acetone	50000	10000 *	<2 U	<2 U	2.94	<2 U	<2 U	<2 U
Cis-1,2-Dichloroethene	NS	6200 *	2.48	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Ethylbenzene	50000	580000	<0.5 U	0.83	<0.5 U	<0.5 U	<0.5 U	<0.5 U
M,P-Xylene	NS	NS	<1 U	3.6	<1 U	<1 U	<1 U	<1 U
Naphthalene	NS	210 *	<2 U	8	<2 U	<2 U	<2 U	<2 U
o-Xylene (1,2-Dimethylbenzene)	NS	NS	<0.5 U	1.8	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Tetrachloroethene (PCE)	340	88	3.28	<0.5 U	0.61	0.99	0.96	<0.5 U
Toluene	23500	4000000	<0.5 U	4.4	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Trans-1,2-Dichloroethene	NS	10000 *	0.86	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Trichloroethene (TCE)	27	2340	27	<0.5 U	7.14	7.11	7.13	<0.5 U

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental
DF - Dilution factor
ug/l - micrograms per liter
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018)

Qualifiers:
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Groundwater Volatilization Criteria
10 - Result exceeds CTDEEP RSRs - Surface Water Protection Criteria
10 - RL exceeds screening level

Table 9C
March 2022 Soil Vapor Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Soil Vapor Volatilization Criteria	SV-01	SV-02	DUP-SV_031122 SV-02	SV-03
		03/11/2022	03/11/2022	03/11/2022	03/11/2022
		Result	Result	Result	Result
Volatile Organic Compounds (ug/m3)					
1,2,4-Trimethylbenzene	20000 *	2.5	2.3	2.9	1.6
1,3,5-Trimethylbenzene (Mesitylene)	20000 *	<0.82 U	<0.85 U	1.1	<0.78 U
1,3-Dichlorobenzene	55000	27	17	17	<0.95 U
Acetone	140000	60	32	24	30
Benzene	2500	0.74	8 J	4.4 J	1
Carbon Tetrachloride	380	0.31	0.33	0.31	0.4
Chloroform	380	<0.81 U	1.8	1.4	0.85
Chloromethane	3600 *	0.58	0.43	0.62	0.65
Cis-1,2-Dichloroethene	NS	0.59	0.82 J	0.4 J	<0.16 U
Dichlorodifluoromethane	39000 *	3.3	2.1	2.1	2.3
Ethylbenzene	40000	2.7	3.1	2.5	1.5
M,P-Xylene	NS	12	10	8.6	6.2
Methyl Ethyl Ketone (2-Butanone)	376000	3.4	3 J	1.9 J	0.74
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	28000	0.82	7 J	<0.68 UJ	<0.65 U
Methylene Chloride	2300	15	7.3 J	27 J	6.1
o-Xylene (1,2-Dimethylbenzene)	NS	3.5	2.9	2.8	2.1
Tetrachloroethene (PCE)	3800	4.8	7 J	3.9 J	2.1
Toluene	160000	13	11 J	7 J	2.9
Total Xylenes	170000	16	13	11	8.4
Trichloroethene (TCE)	760	28	3.4 J	2.1 J	<0.21 U
Trichlorofluoromethane	280000 *	1.4	1.3	1.3	1.8

Notes:
CT DEEP - Connecticut Department of Energy and Environmental Protection
RSRs - Remediation Standard Regulations
CAS - Chemical Abstract Service
NS - No standard
ug/m3 - Micrograms per cubic meter
ND - Not detected
RL - Reporting Limit
<RL - Not detected
* - Additional Polluting Substance
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances

Qualifiers:
R – The sample results are unusable because certain criteria were not met when generating the data. The analyte may or may not be present in the sample.
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate or imprecise.
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Table 10
Comparison of Remedial Alternatives
Western Middle School
Greenwich, Connecticut
Langan Project No.: 140148201

Evaluation Criteria	**Remediate to Numerical Criteria**	**Remedial Alternative #1**	**Remedial Alternative #2**	**Remedial Alternative #3**
	Remove all fill to underlying rock or native soil	Remove fill to 4 feet; plus remove PCBs >10ppm	Remove fill to 2 feet; plus remove PCBs >10ppm	Remove fill to 1 foot; plus remove PCBs >10ppm
Overall Protection of Human Health and the Environment	Yes	Yes, with site restrictions	Yes, with site restrictions	Yes, with site restrictions
Compliance with Applicable Regulations	Yes	Yes	Yes, with variances	Yes, with variances
Long-Term Effectiveness and Permanence	Yes; unlikely to require land use restrictions	Yes, with long-term cap inspection and maintenance	Yes, with long-term cap inspection and maintenance	Yes, with long-term cap inspection and maintenance
Reduction of Toxicity, Mobility, or Volume through Treatment	Greatest reduction	Significant reduction of risk for current uses	Significant reduction of risk for current uses	Significant reduction of risk for current uses
Short-Term Effectiveness	Least short-term effectiveness; anticipated to take **± 374 construction days**	Better effectiveness than alternative 1; but still anticipated to take **± 252 construction days**	Effective in the short-term; but still anticipated to take **± 144 construction days**	Most short-term effectiveness; anticipated to take **± 90 construction days**
Implementability	Least implementable	Implementable, but high trucking production rate is assumed	Implementable, but high trucking production rate is assumed	Most implementable
Cost-Effectiveness	**± 38.7 MIL**	**± 28.3 MIL**	**± 19.2 MIL**	**± 14.6 MIL**
State and Federal Acceptance	Probable acceptability	Probable acceptability	Probable acceptability with variances and consideration of public comments	Unlikely acceptability with variances and consideration of public comments
Community Acceptance (Construction impact on Community)	Very large community impact	Large community impacts	Less community impacts	Least community impacts

Description of Remedial Alternatives

Remediate to Numerical Criteria – Removal of all historic fill beneath the athletic fields to underlying rock or native soil.

Remedial Alternative 1 – Removal of fill beneath the athletic fields to a depth of 4 feet, plus the removal of PCBs in soil ≥10 mg/kg (regardless of depth).

Remedial Alternative 2 – Removal of fill beneath the athletic fields to a depth of 2 feet, plus the removal of PCBs in soil ≥10 mg/kg (regardless of depth).

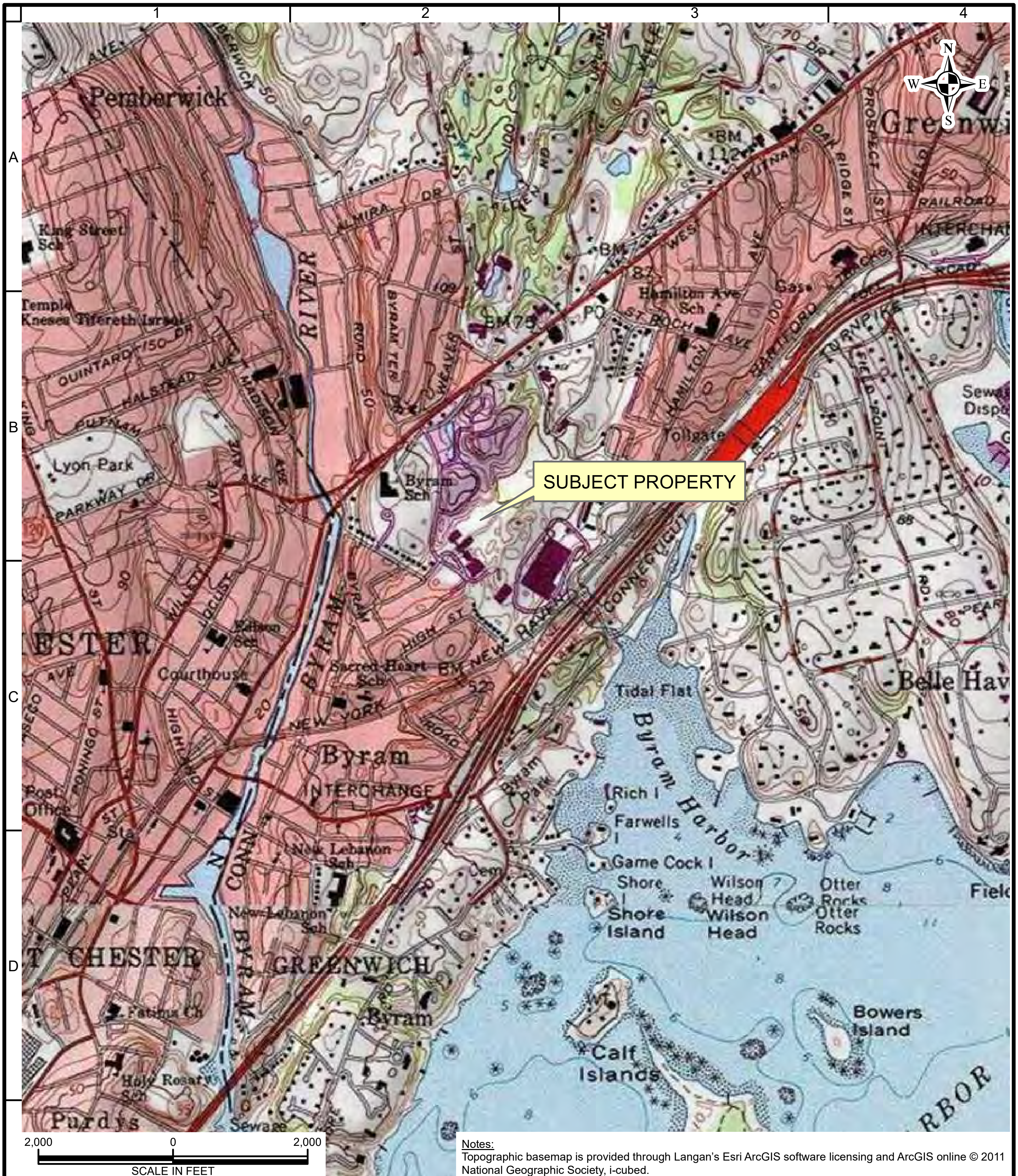
Remedial Alternative 3 – Removal of fill beneath the athletic fields to a depth of 1 foot, plus the removal of PCBs in soil ≥10 mg/kg (regardless of depth).

General Assumptions and Conditions

1. Cost estimate is based on Langan past experience and generalized vendor estimates.
2. Transportation and disposal pricing are subject to varying market conditions, and therefore, may be subject to cost increases at the time that work is to be conducted.
3. Transportation and disposal pricing will be further refined following the completion of waste chracterization sampling.
4. Changes in cost elements are likely to occur as a result of new information and data to be collected during engineering design and any potential pre-remedial supplemental investigations. Prior to and during remediation, there will likely be changes in the unit rates and costs for services, labor, materials and equipment that will lead to changes in the final cost of the project. Additional changes in costs may result from changes in quantities and unknowns that may be encountered during remediation.

FIGURES

LIST OF FIGURES



Notes:
Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2011 National Geographic Society, i-cubed.

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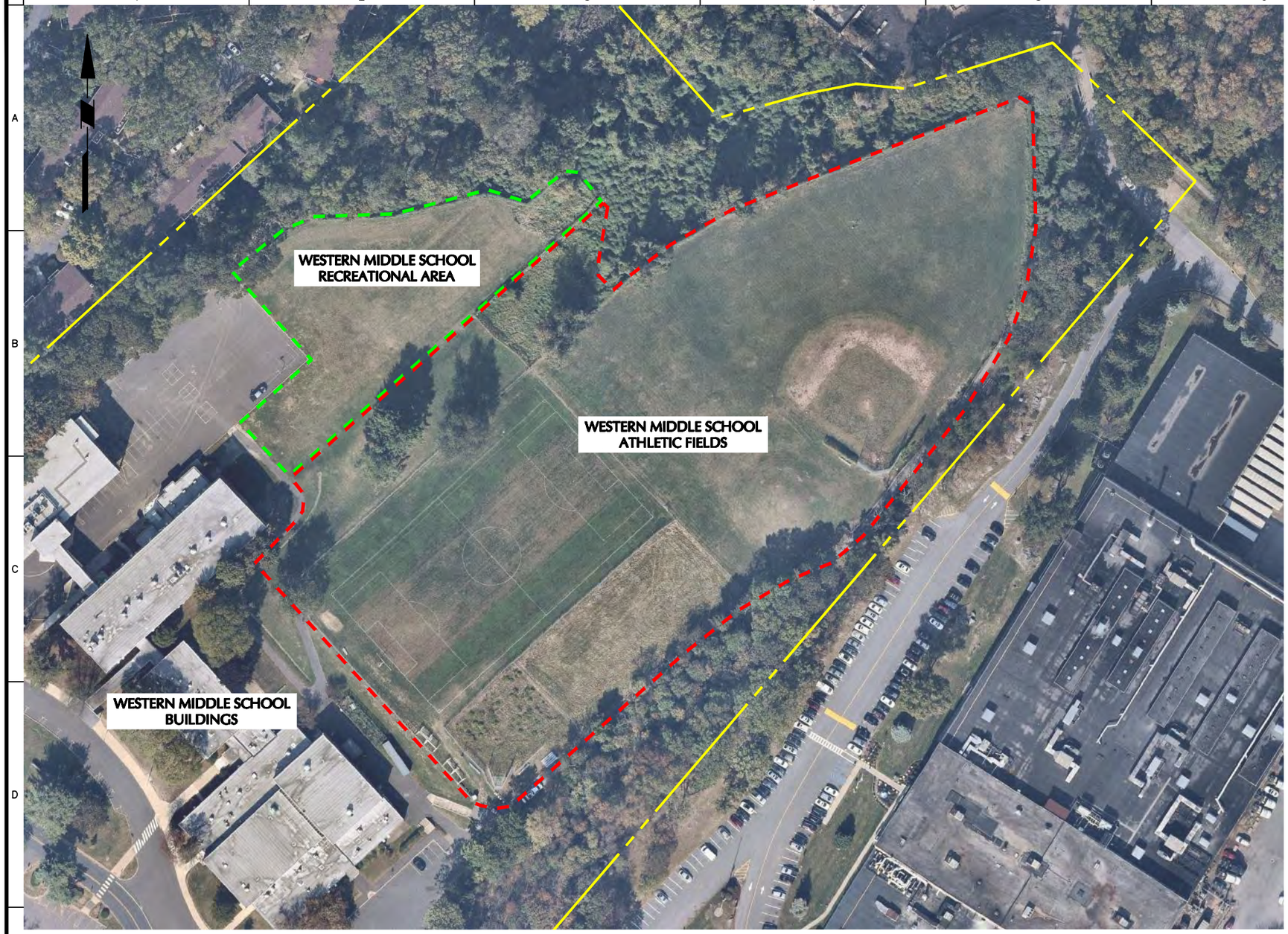
Project	Drawing Title	Project No. 140148201	Figure
WESTERN MIDDLE SCHOOL 1 WESTERN JUNIOR HIGHWAY GREENWICH CONNECTICUT	SITE LOCATION MAP	Date JANUARY 2022 Scale 1" = 2,000' Drawn By JPH Submission Date JANUARY 2022	1 Sheet 1 of 11

Path: \\langan.com\data\NH\data2\140148201\ArcGIS\ArcMap_Documents\Figure 1 USGS Site Location Map.mxd Date: 1/11/2022 User: jhall Time: 11:13:43 PM



LEGEND

- PROPERTY BOUNDARY
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.

120 0 40 80 120
SCALE IN FEET

LANGAN
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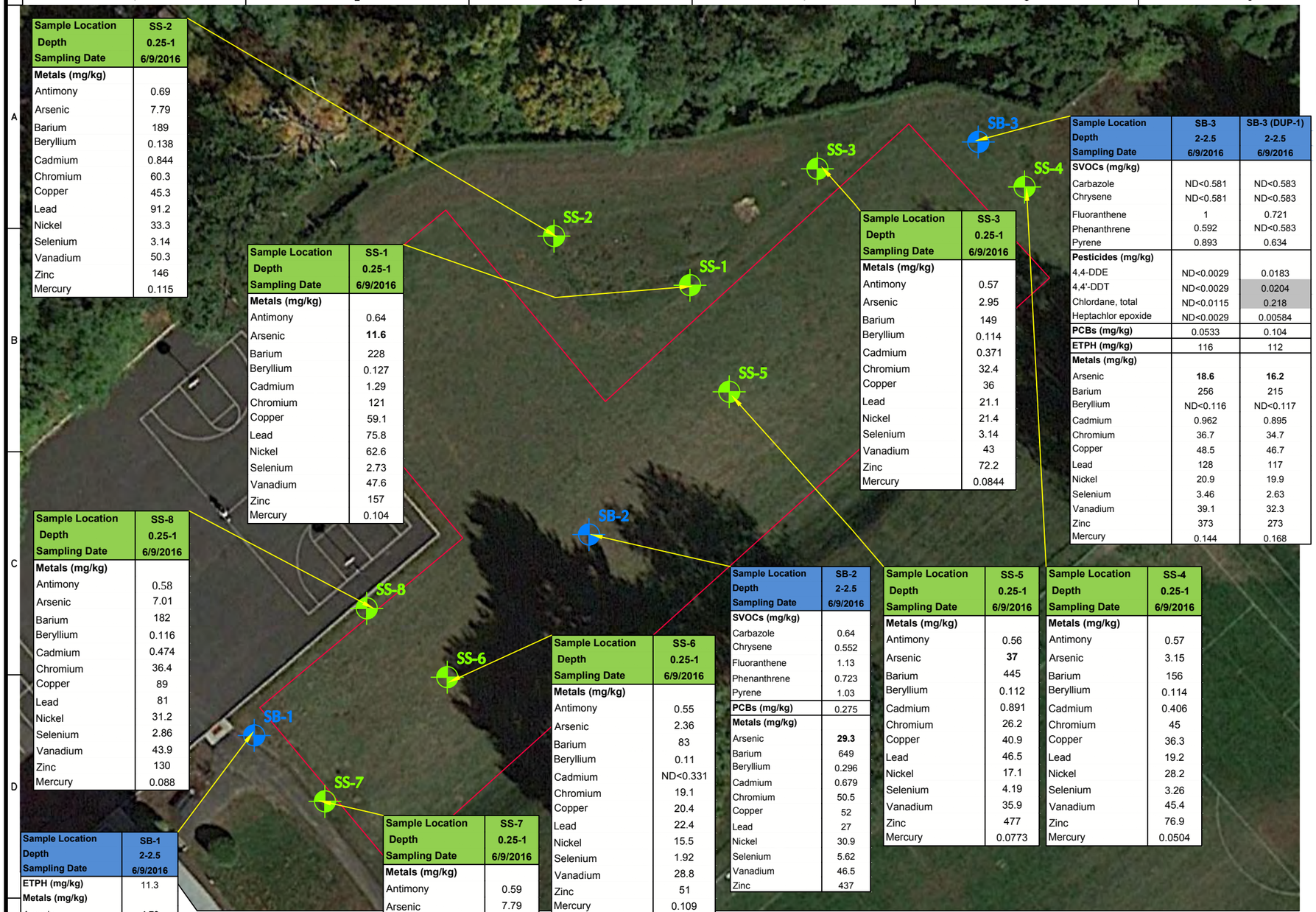
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SITE PLAN AND EXISTING CONDITIONS

Project No. 140148201	Drawing No. 2
Date JANUARY 2022	
Scale 1"=120'	
Drawn By JPH / Checked By RJW	
Submission Date JANUARY 2022	Sheet 2 of 11

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 1401482011\2D-DesignFiles\140131911 - HHRA Evaluation Areas.dwg Date: 1/11/2022 Time: 23:18 User: jhall Style Table: Langan.stb Layout: SITE PLAN



Sample Location	SS-2
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.69
Arsenic	7.79
Barium	189
Beryllium	0.138
Cadmium	0.844
Chromium	60.3
Copper	45.3
Lead	91.2
Nickel	33.3
Selenium	3.14
Vanadium	50.3
Zinc	146
Mercury	0.115

Sample Location	SS-1
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.64
Arsenic	**11.6**
Barium	228
Beryllium	0.127
Cadmium	1.29
Chromium	121
Copper	59.1
Lead	75.8
Nickel	62.6
Selenium	2.73
Vanadium	47.6
Zinc	157
Mercury	0.104

Sample Location	SS-3
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.57
Arsenic	2.95
Barium	149
Beryllium	0.114
Cadmium	0.371
Chromium	32.4
Copper	36
Lead	21.1
Nickel	21.4
Selenium	3.14
Vanadium	43
Zinc	72.2
Mercury	0.0844

Sample Location	SB-3	SB-3 (DUP-1)
Depth	2-2.5	2-2.5
Sampling Date	6/9/2016	6/9/2016
SVOCs (mg/kg)		
Carbazole	ND<0.581	ND<0.583
Chrysene	ND<0.581	ND<0.583
Fluoranthene	1	0.721
Phenanthrene	0.592	ND<0.583
Pyrene	0.893	0.634
Pesticides (mg/kg)		
4,4-DDE	ND<0.0029	0.0183
4,4'-DDT	ND<0.0029	0.0204
Chlordane, total	ND<0.0115	0.218
Heptachlor epoxide	ND<0.0029	0.00584
PCBs (mg/kg)	0.0533	0.104
ETPH (mg/kg)	116	112
Metals (mg/kg)		
Arsenic	**18.6**	**16.2**
Barium	256	215
Beryllium	ND<0.116	ND<0.117
Cadmium	0.962	0.895
Chromium	36.7	34.7
Copper	48.5	46.7
Lead	128	117
Nickel	20.9	19.9
Selenium	3.46	2.63
Vanadium	39.1	32.3
Zinc	373	273
Mercury	0.144	0.168

Sample Location	SS-8
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.58
Arsenic	7.01
Barium	182
Beryllium	0.116
Cadmium	0.474
Chromium	36.4
Copper	89
Lead	81
Nickel	31.2
Selenium	2.86
Vanadium	43.9
Zinc	130
Mercury	0.088

Sample Location	SB-2
Depth	2-2.5
Sampling Date	6/9/2016
SVOCs (mg/kg)	
Carbazole	0.64
Chrysene	0.552
Fluoranthene	1.13
Phenanthrene	0.723
Pyrene	1.03
PCBs (mg/kg)	0.275
Metals (mg/kg)	
Arsenic	**29.3**
Barium	649
Beryllium	0.296
Cadmium	0.679
Chromium	50.5
Copper	52
Lead	27
Nickel	30.9
Selenium	5.62
Vanadium	46.5
Zinc	437

Sample Location	SS-5
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.56
Arsenic	**37**
Barium	445
Beryllium	0.112
Cadmium	0.891
Chromium	26.2
Copper	40.9
Lead	46.5
Nickel	17.1
Selenium	4.19
Vanadium	35.9
Zinc	477
Mercury	0.0773

Sample Location	SS-4
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.57
Arsenic	3.15
Barium	156
Beryllium	0.114
Cadmium	0.406
Chromium	45
Copper	36.3
Lead	19.2
Nickel	28.2
Selenium	3.26
Vanadium	45.4
Zinc	76.9
Mercury	0.0504

Sample Location	SS-6
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.55
Arsenic	2.36
Barium	83
Beryllium	0.11
Cadmium	ND<0.331
Chromium	19.1
Copper	20.4
Lead	22.4
Nickel	15.5
Selenium	1.92
Vanadium	28.8
Zinc	51
Mercury	0.109

Sample Location	SB-1
Depth	2-2.5
Sampling Date	6/9/2016
ETPH (mg/kg)	11.3
Metals (mg/kg)	
Arsenic	**4.73**
Barium	198
Beryllium	ND<0.107
Cadmium	0.471
Chromium	89.2
Copper	35.8
Lead	25.5
Nickel	43.7
Selenium	3.43
Vanadium	61.1
Zinc	64.2
Pesticides (mg/kg)	
4,4'-DDT	0.00347

Sample Location	SS-7
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.59
Arsenic	7.79
Barium	283
Beryllium	0.118
Cadmium	1.23
Chromium	104
Copper	61.2
Lead	63.5
Nickel	51.5
Selenium	3.18
Vanadium	65.5
Zinc	147
Mercury	0.102

KEY MAP

SCALE: 1" = 250'

Analyte	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria
SVOCs (mg/kg)		
Carbazole	31	1
Chrysene	84	1
Fluoranthene	1,000	56
Phenanthrene	1,000	40
Pyrene	1,000	40
Pesticides (mg/kg)		
4,4-DDE	1.8	0.02
4,4'-DDT	1.8	0.02
Chlordane, total	0.49	0.066
Heptachlor epoxide	0.067	0.02
PCBs (mg/kg)	1	NE
ETPH (mg/kg)	500	2,500
Metals (mg/kg)		
Antimony	27	NE
Arsenic	10	NE
Barium	4,700	NE
Beryllium	2	NE
Cadmium	34	NE
Chromium	4,000	NE
Copper	2,500	NE
Lead	400	NE
Nickel	1,400	NE
Selenium	340	NE
Silver	340	NE
Thallium	5.4	NE
Vanadium	470	NE
Zinc	20,000	NE
Mercury (mg/kg)		
Mercury	20	NE

LEGEND

- SB-3 — LANGAN SOIL BORINGS
- SS-4 — LANGAN SURFICAL SOIL BORINGS
- PROPOSED LOCATION OF MODULAR CLASSROOMS

GENERAL NOTES

1 LANGAN "SB" SOIL BORINGS WERE ADVANCED TO 15 FEET BELOW GRADE

2 LANGAN "SS" SOIL BORINGS ADVANCED TO 6 INCHES BELOW GRADE

3 ONLY ANALYTES WITH DETECTIONS ARE SHOWN IN THE TABLE

4 BOLD INDICATES AN EXCEEDANCE OF THE RESIDENTIAL DIRECT EXPOSURE CRITERIA

5 SHADING INDICATES AN EXCEEDANCE OF THE POLLUTANT MOBILITY CRITERIA

6 ND = NOT DETECTED ABOVE LABORATORY REPORTING LIMITS

7 MG/KG = MILLIGRAMS PER KILOGRAM

8 VOCS = VOLATILE ORGANIC COMPOUNDS

9 SVOCS = SEMI-VOLATILE ORGANIC COMPOUNDS

40 0 10 25 40

SCALE IN FEET

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Langan International LLC
Collectively known as Langan

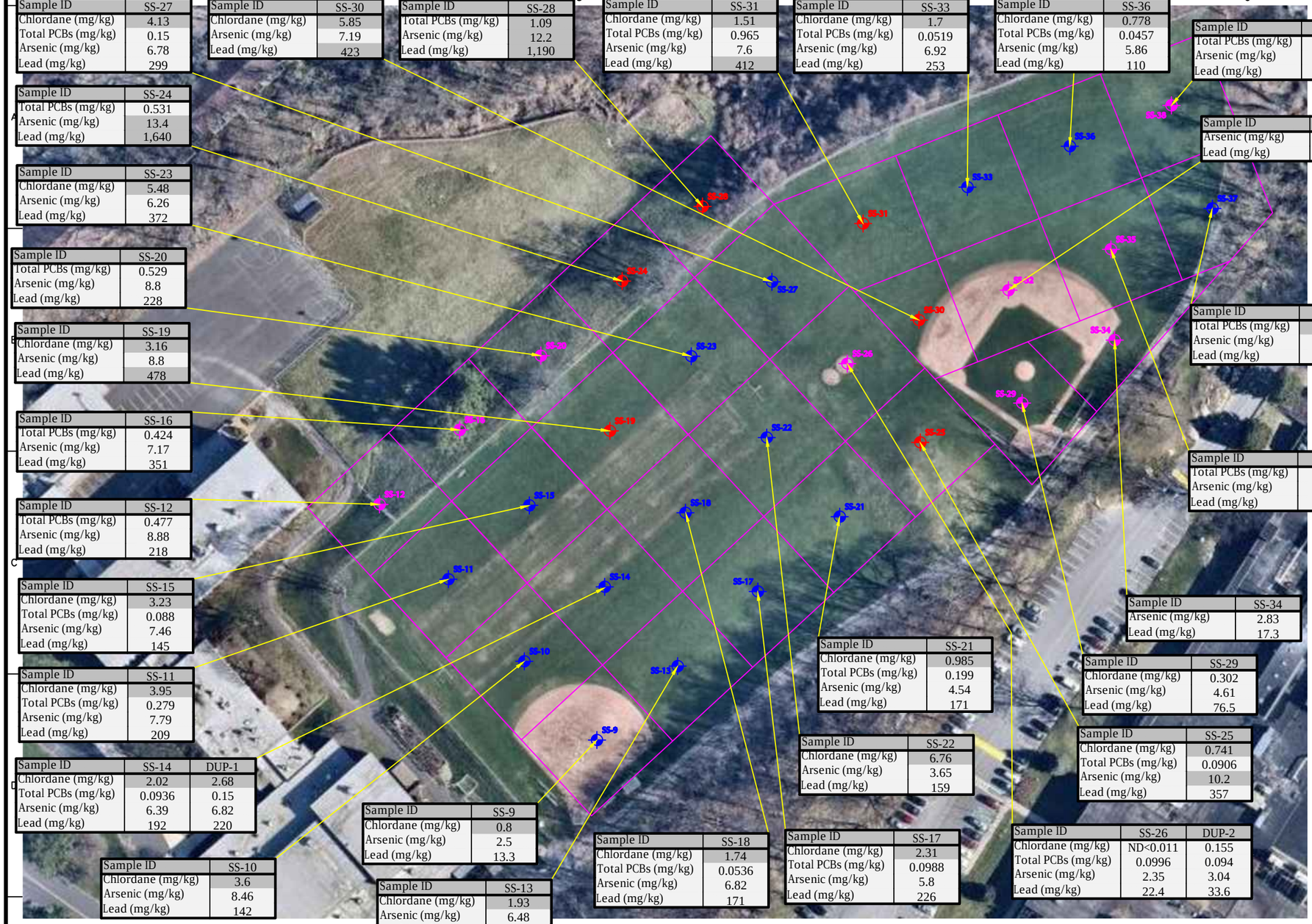
Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
JUNE 2016 PHASE II ESI SOIL ANALYTICAL RESULTS MAP

Project No. 140148201
Date FEBRUARY 2018
Scale 1"=40'
Drawn By JPH | Checked By RJW
Submission Date FEBRUARY 2018

Drawing No. **3A**
Sheet 3A of 11

Filename: \\langan.com\data\NHV\data9\140131911\Cadd Data - 140131911\SheetFiles\Figure 3 ALL Boring Locations with Tags 6-27-2016.dwg Date: 2/27/2018 Time: 11:20 User: jhall Style Table: Langan.stb Layout: ANSIB-BL



Sample ID	SS-27
Chlordane (mg/kg)	4.13
Total PCBs (mg/kg)	0.15
Arsenic (mg/kg)	6.78
Lead (mg/kg)	299

Sample ID	SS-30
Chlordane (mg/kg)	5.85
Arsenic (mg/kg)	7.19
Lead (mg/kg)	423

Sample ID	SS-28
Total PCBs (mg/kg)	1.09
Arsenic (mg/kg)	12.2
Lead (mg/kg)	1,190

Sample ID	SS-31
Chlordane (mg/kg)	1.51
Total PCBs (mg/kg)	0.965
Arsenic (mg/kg)	7.6
Lead (mg/kg)	412

Sample ID	SS-33
Chlordane (mg/kg)	1.7
Total PCBs (mg/kg)	0.0519
Arsenic (mg/kg)	6.92
Lead (mg/kg)	253

Sample ID	SS-36
Chlordane (mg/kg)	0.778
Total PCBs (mg/kg)	0.0457
Arsenic (mg/kg)	5.86
Lead (mg/kg)	110

Sample ID	SS-38
Total PCBs (mg/kg)	0.742
Arsenic (mg/kg)	7.03
Lead (mg/kg)	303

Sample ID	SS-32
Arsenic (mg/kg)	3.49
Lead (mg/kg)	7.74

Sample ID	SS-37
Total PCBs (mg/kg)	5.03
Arsenic (mg/kg)	7.17
Lead (mg/kg)	244

Sample ID	SS-35
Total PCBs (mg/kg)	0.237
Arsenic (mg/kg)	5.17
Lead (mg/kg)	168

Sample ID	SS-34
Arsenic (mg/kg)	2.83
Lead (mg/kg)	17.3

Sample ID	SS-29
Chlordane (mg/kg)	0.302
Arsenic (mg/kg)	4.61
Lead (mg/kg)	76.5

Sample ID	SS-25
Chlordane (mg/kg)	0.741
Total PCBs (mg/kg)	0.0906
Arsenic (mg/kg)	10.2
Lead (mg/kg)	357

Sample ID	SS-26	DUP-2
Chlordane (mg/kg)	ND<0.011	0.155
Total PCBs (mg/kg)	0.0996	0.094
Arsenic (mg/kg)	2.35	3.04
Lead (mg/kg)	22.4	33.6

Sample ID	SS-24
Total PCBs (mg/kg)	0.531
Arsenic (mg/kg)	13.4
Lead (mg/kg)	1,640

Sample ID	SS-23
Chlordane (mg/kg)	5.48
Arsenic (mg/kg)	6.26
Lead (mg/kg)	372

Sample ID	SS-20
Total PCBs (mg/kg)	0.529
Arsenic (mg/kg)	8.8
Lead (mg/kg)	228

Sample ID	SS-19
Chlordane (mg/kg)	3.16
Arsenic (mg/kg)	8.8
Lead (mg/kg)	478

Sample ID	SS-16
Total PCBs (mg/kg)	0.424
Arsenic (mg/kg)	7.17
Lead (mg/kg)	351

Sample ID	SS-12
Total PCBs (mg/kg)	0.477
Arsenic (mg/kg)	8.88
Lead (mg/kg)	218

Sample ID	SS-15
Chlordane (mg/kg)	3.23
Total PCBs (mg/kg)	0.088
Arsenic (mg/kg)	7.46
Lead (mg/kg)	145

Sample ID	SS-11
Chlordane (mg/kg)	3.95
Total PCBs (mg/kg)	0.279
Arsenic (mg/kg)	7.79
Lead (mg/kg)	209

Sample ID	SS-14	DUP-1
Chlordane (mg/kg)	2.02	2.68
Total PCBs (mg/kg)	0.0936	0.15
Arsenic (mg/kg)	6.39	6.82
Lead (mg/kg)	192	220

Sample ID	SS-10
Chlordane (mg/kg)	3.6
Arsenic (mg/kg)	8.46
Lead (mg/kg)	142

Sample ID	SS-9
Chlordane (mg/kg)	0.8
Arsenic (mg/kg)	2.5
Lead (mg/kg)	13.3

Sample ID	SS-13
Chlordane (mg/kg)	1.93
Arsenic (mg/kg)	6.48
Lead (mg/kg)	95.7

Sample ID	SS-18
Chlordane (mg/kg)	1.74
Total PCBs (mg/kg)	0.0536
Arsenic (mg/kg)	6.82
Lead (mg/kg)	171

Sample ID	SS-17
Chlordane (mg/kg)	2.31
Total PCBs (mg/kg)	0.0988
Arsenic (mg/kg)	5.8
Lead (mg/kg)	226

Sample ID	SS-21
Chlordane (mg/kg)	0.985
Total PCBs (mg/kg)	0.199
Arsenic (mg/kg)	4.54
Lead (mg/kg)	171

Sample ID	SS-22
Chlordane (mg/kg)	6.76
Arsenic (mg/kg)	3.65
Lead (mg/kg)	159

LEGEND

SS-## SOIL BORING LOCATION WITH NO EXCEEDENCES OF THE RESIDENTIAL DIRECT EXPOSURE CRITERIA

SS-## SOIL BORING LOCATION WITH MORE THAN ONE EXCEEDENCE OF THE RESIDENTIAL DIRECT EXPOSURE CRITERIA

SS-## SOIL BORING LOCATION WITH CHLORDANE CONCENTRATIONS EXCEEDING RESIDENTIAL DIRECT EXPOSURE CRITERIA

NOTES

1. ALL SURFICIAL SOIL SAMPLES WERE COLLECTED 0 TO 3 INCHES BELOW GROUND SURFACE.
2. SHADING INDICATES AN EXCEEDANCE OF THE RDEC AS INDICATED BELOW.

Analyte	Residential Direct Exposure Criteria (mg/kg)
Chlordane	0.49
Total PCBs	1
Arsenic	10
Lead	400

100 0 50 100

SCALE IN FEET

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1 WESTERN JUNIOR HIGHWAY
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Drawing Title
JULY 2016 SURFICIAL SOIL ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 3B
Date FEBRUARY 2018	
Scale 1"=100'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 3B of 11

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Tag Map JPH.dwg Date: 2/27/2018 Time: 11:22 User: jhall Style Table: Langan.stb Layout: HHRA

Sample ID	SS-28W20-N10
Lead (mg/kg)	467

Sample ID	SS-28N-20
Lead (mg/kg)	259

Sample ID	SS-28W20-NW10
Lead (mg/kg)	361

Sample ID	SS-28E-10
Lead (mg/kg)	340

Sample ID	SS-28W-30
Lead (mg/kg)	345

Sample ID	SS-28S-10
Lead (mg/kg)	288

Sample ID	SS-28W-40
Lead (mg/kg)	293

Sample ID	SS-28W20-S10
Lead (mg/kg)	476

Sample ID	SS-24N-10
Lead (mg/kg)	449

Sample ID	SS-28W20-S20
Lead (mg/kg)	295

Sample ID	SS-24W-10
Lead (mg/kg)	470

Sample ID	SS-22N-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-24S-20
Lead (mg/kg)	542

Sample ID	SS-24E-20
Lead (mg/kg)	537

Sample ID	SS-22E-10	SS-DUP_10.7.16
Chlordane (mg/kg)	ND<0.033	ND<0.033

Sample ID	SS-22W-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-22S-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-9N-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-9E-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-9W-10
Chlordane (mg/kg)	0.0369

Sample ID	SS-9S-10
Chlordane (mg/kg)	ND<0.033

60 0 20 40 60

SCALE IN FEET

KEY MAP

SCALE: 1" = 250'

LEGEND

SS-## SOIL BORING LOCATION WITH LEAD CONCENTRATION BELOW 606 PPM; SOIL BORING LOCATION WITH CHLORDANE BELOW RDEC

SS-## SOIL BORING LOCATION WITH LEAD CONCENTRATION EXCEEDING 606 PPM; SOIL BORING LOCATION WITH CHLORDANE EXCEEDING RDEC

REMEDIAL EXCAVATION AREA

NOTES

1. BORING LOCATIONS ARE LOCATED BY GPS COORDINATES COLLECTED DURING SAMPLING AND MEASUREMENTS MADE IN THE FIELD.
2. ALL DELINEATION SOIL SAMPLES WERE COLLECTED FROM 0 TO 3 INCHES BELOW GROUND SURFACE.

Analyte	Residential Direct Exposure Criteria (mg/kg)	Site-Specific Action Level (mg/kg)
Chlordane	0.49	NE
Lead	400	606

MG/KG = MILLIGRAM PER KILOGRAM
NE = CRITERIA NOT ESTABLISHED FOR COMPOUND

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WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
LEAD AND CHLORDANE DELINEATION ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 3C
Date FEBRUARY 2018	
Scale 1"=60'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 3C of 11

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Delineation Tag Map_DRAFT JPH.dwg Date: 2/7/2018 Time: 13:52 User: jhall Style Table: Langan.stb Layout: ANSIB-BL

Sample ID	SB-11 (3")	SB-11 (1')
Chlordane (mg/kg)	ND<0.0565	NA
Aroclor 1254 (mg/kg)	ND<0.0283	0.162
Total PCBs (mg/kg)	ND<0.0283	0.162

Sample ID	SB-10 (3")	SB-10 (1')
Chlordane (mg/kg)	ND<0.0577	NA
Aroclor 1254 (mg/kg)	ND<0.0288	ND<0.0265
Total PCBs (mg/kg)	ND<0.0288	ND<0.0265

Sample ID	SB-9 (3")	SB-9 (1')
Chlordane (mg/kg)	ND<0.0565	NA
Aroclor 1254 (mg/kg)	ND<0.0283	ND<0.0278
Total PCBs (mg/kg)	ND<0.0283	ND<0.0278

Sample ID	SB-8 (3")	SB-8 (1')
Chlordane (mg/kg)	ND<0.06	NA
Aroclor 1254 (mg/kg)	ND<0.03	ND<0.0271
Total PCBs (mg/kg)	ND<0.03	ND<0.0271

Sample ID	SB-7 (3")	SB-7 (1')
Chlordane (mg/kg)	ND<0.0569	NA
Aroclor 1254 (mg/kg)	ND<0.0285	ND<0.0274
Total PCBs (mg/kg)	ND<0.0285	ND<0.0274

Sample ID	SB-4 (3")	SB-4 (1')
Chlordane (mg/kg)	ND<0.0588	NA
Aroclor 1254 (mg/kg)	ND<0.0294	ND<0.0272
Total PCBs (mg/kg)	ND<0.0294	ND<0.0272

Sample ID	SB-5 (3")	SB-5 (1')
Chlordane (mg/kg)	0.326	NA
Aroclor 1254 (mg/kg)	ND<0.0269	ND<0.0273
Total PCBs (mg/kg)	ND<0.0269	ND<0.0273

Sample ID	SB-6 (3")	SB-6 (1')	DUP (1')
Chlordane (mg/kg)	ND<0.0577	NA	NA
Aroclor 1254 (mg/kg)	ND<0.0289	ND<0.0285	ND<0.0279
Total PCBs (mg/kg)	ND<0.0289	ND<0.0285	ND<0.0279

KEY MAP

SCALE: 1" = 250'

LEGEND

SS-## SHALLOW SOIL BORING LOCATION

NOTES

1. BORING LOCATIONS ARE LOCATED BY GPS COORDINATES COLLECTED DURING SAMPLING AND MEASUREMENTS MADE IN THE FIELD.
2. SOIL SAMPLES WERE COLLECTED FROM 0 TO 3 INCHES AND 12 INCHES BELOW GROUND SURFACE.

Analyte	Residential Direct Exposure Criteria (mg/kg)
Chlordane	0.49
Aroclor 1254	NE
Total PCBs	1

MG/KG = MILLIGRAM PER KILOGRAM
NA = COMPOUND NOT ANALYZED
ND = NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
NE = CRITERIA NOT ESTABLISHED FOR COMPOUND

50 0 25 50
SCALE IN FEET

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Drawing Title
OCTOBER 2016 RECREATIONAL AREA SOIL ANALYTICAL RESULTS MAP

Project No. 140148201
Date FEBRUARY 2018
Scale 1"=50'
Drawn By JPH | Checked By RJW
Submission Date FEBRUARY 2018

Drawing No. 3D
Sheet 3D of 11

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Delineation Tag Map_DRAFT JPH.dwg Date: 2/7/2018 Time: 13:58 User: jhall Style Table: Langan.stb Layout: Swing Space

Sample ID	SS-28-E10-3"	SS-28-E10-1'
Total PCBs (mg/kg)	0.379	0.248

Sample ID	SS-28	SS-28-1'	SS-28-2'
Total PCBs (mg/kg)	1.09	1.18	0.187

Sample ID	SS-28-N10-3"	SS-28-N10-2'	SS-28-N10-3'
Total PCBs (mg/kg)	1.25	3.7	0.348

Sample ID	SS-28-N20-3"	SS-28-N20-2'
Total PCBs (mg/kg)	0.444	0.971*

Sample ID	SS-28-W10-3"	SS-28-W10-2'
Total PCBs (mg/kg)	10.3	0.0586

Sample ID	SS-28-W20N10-3"
Total PCBs (mg/kg)	0.0424

Sample ID	SS-28-W30-3"
Total PCBs (mg/kg)	ND<0.0316

Sample ID	SS-28-W20S10-3"
Total PCBs (mg/kg)	ND<0.0325

Sample ID	SS-28-W20-3"	SS-28-W20-2'
Total PCBs (mg/kg)	3.06	0.223

Sample ID	SS-28-S20-1'
Total PCBs (mg/kg)	0.188

Sample ID	SS-28-S10-3"	SS-28-S10-1'	SS-28-S10-2'
Total PCBs (mg/kg)	0.583	1*	ND<0.0251

SB-2 SB-9 SB-8 SB-7 SB-70 SS-71 SS-24 SS-27 SS-68 SS-69 SS-72 SS-60 SS-58 SS-59 SS-20 SS-63 SS-34 SS-23 SS-26 SS-53 SS-16 SS-20 SS-73 SS-87 SS-78 SS-67 SS-66 SS-60 SS-54 SS-29 SS-19 SS-22 SS-25 SS-55 SS-31 SS-57 SS-48 SS-33 SS-49 SS-52 SS-32 SS-50 SS-51 SS-45 SS-41 SS-47 SS-36 SS-46 SS-33 SS-42

20 0 5 10 20
SCALE IN FEET

KEY MAP
SCALE: 1" = 250'

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG

NOTES

1. ALL SURFICIAL SOIL SAMPLES WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER.
2. FOR THE VERTICAL DELINEATION SOIL BORINGS ADVANCED AT THE PREVIOUS EXCEEDANCE LOCATIONS, SOIL SAMPLES WERE COLLECTED AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
3. FOR THE HORIZONTAL DELINEATION SOIL BORINGS, SOIL SAMPLES WERE COLLECTED WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER, AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
4. * = PCB CONCENTRATION APPROACHES RDEC OF 1 MG/KG NECESSITATING DELINEATION
5. MG/KG = MILLIGRAMS PER KILOGRAMS
6. ND = NON-DETECT
7. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA

ANALYTICAL RESULT TAG MAP

SOILS WITH PCBs > 1 MG/KG
SOILS WITH PCBs > 50 MG/KG

Sample ID	Sample # (Depth, "=inches, '=feet)
Total PCBs (mg/kg)	Concentration

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Drawing Title
SS-28 PCB DELINEATION ANALYTICAL RESULTS MAP

Project No.	Drawing No.
140148201	3E
Date: FEBRUARY 2018	
Scale: 1"=20'	
Drawn By: JPH / Checked By: RJW	
Submission Date: FEBRUARY 2018	Sheet 3E of 11

SUBMISSION DATE: FEBRUARY 2018
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-Design\Files\140148201-Western Middle School_PCB Excavation Exents_2017.10.30.dwg Date: 2/27/2018 Time: 11:25 User: jhall Style Table: Langan.stb Layout: SS-28 Excavation Extents

Sample ID	LB-31-N40-SO7 (2')	LB-31-N40-SO7 (3')	LB-31-N40-S7 (4')	LB-31-N40-S7 (6')	LB-31-N40-S7 (7')
Total PCBs (mg/kg)	4.92	3.58	14.8	2.45	0.28

Sample ID	SS-31-N40-2'	SS-31-N40-3'	SS-31-N40-4'
Total PCBs (mg/kg)	7.67	1.22	0.084

Sample ID	LB-31-N40-SO11 (2')	LB-31-N40-SO11 (4')
Total PCBs (mg/kg)	1.08	0.901*

Sample ID	LB-31-N40-SO14 (2')	LB-31-N40-SO14 (4')	LB-31-N40-SO14 (5')	LB-31-N40-SO14 (6')
Total PCBs (mg/kg)	0.637	70.8	93	0.408

Sample ID	LB-31-N40-SO5 (2')
Total PCBs (mg/kg)	0.0834

Sample ID	LB-31-N30-SO2 (2')	LB-31-N30-S02 (3')	LB-31-N30-S02 (4')	LB-31-N30-S02 (5')	LB-31-N30-S02 (7')
Total PCBs (mg/kg)	1.29	53.9	1.01	4.47	9.01

Sample ID	LB-31-N30-SO15 (2')	LB-31-N30-SO15 (4')
Total PCBs (mg/kg)	4.73	0.489

Sample ID	LB-31-N30-SO16 (2')	LB-31-N30-SO16 (4')	LB-31-N30-SO16 (5')
Total PCBs (mg/kg)	5.51	1.02	ND<0.0251

Sample ID	2017.09_SS31_1A (3")	2017.09_SS31_1A (2')	2017.09_SS31_1A (4')	2017.09_SS31_1A (5')
Total PCBs (mg/kg)	ND<0.0305	0.246	0.409	ND<0.0272

Sample ID	LB-31-N30-SO17 (2')	LB-31-N30-SO17 (4')
Total PCBs (mg/kg)	7.55	0.561

Sample ID	LB-31-N30-SO18 (3")	LB-31-N30-SO18 (2')	LB-31-N30-SO18 (4')
Total PCBs (mg/kg)	0.0778	0.829	0.137

Sample ID	2017.09_SS31_2B (3")	2017.09_SS31_2B (4')
Total PCBs (mg/kg)	ND<0.0305	0.18

Sample ID	2017.09_SS31_2A (2')	2017.09_SS31_2A (4')	2017.09_SS31_2A (5')
Total PCBs (mg/kg)	0.243	24.2	ND<0.0243

Sample ID	LB-31-N30-SO1 (2')	LB-31-N30-SO1 (4')
Total PCBs (mg/kg)	1.5	ND<0.029

Sample ID	2017.09_SS31_3A (3")	2017.09_SS31_3A (2')	2017.09_SS31_3A (4')
Total PCBs (mg/kg)	ND<0.0261	0.287	0.204

Sample ID	SS-31-N20W10-3"	SS-31-N20W10-2'
Total PCBs (mg/kg)	0.108	0.418

Sample ID	SS-31-W20-3"	SS-31-W20-2'
Total PCBs (mg/kg)	0.25	0.22

Sample ID	SS-31-W10-3"	SS-31-W10-2'
Total PCBs (mg/kg)	0.996*	0.116

Sample ID	SS-31-N10-3"	SS-31-N10-2'	SS-31-N10-3'
Total PCBs (mg/kg)	2.18	1.81	ND<0.0253

Sample ID	SS-31-3"	SS-31-1'	SS-31-2'
Total PCBs (mg/kg)	0.965*	6.6	0.394

Sample ID	SS-31-S20W10-3"	SS-31-S20W10-2'
Total PCBs (mg/kg)	ND<0.0338	0.73

Sample ID	SS-31-S10-3"	SS-31-S10-2'
Total PCBs (mg/kg)	8.8	0.0677

Sample ID	SS-31-S30-3"	SS-31-S30-3" (DUP)	SS-31-S30-2'
Total PCBs (mg/kg)	ND<0.0332	ND<0.0329	0.179

Sample ID	LB-31-N40-SO12 (2')	LB-31-N40-SO12 (4')	LB-31-N40-SO12 (5')	LB-31-N40-SO12 (6')
Total PCBs (mg/kg)	17.2	1.62	1.74	ND<0.0248

Sample ID	SS-31-N30-3"	SS-31-N30-2'	SS-31-N30-3'
Total PCBs (mg/kg)	ND<0.0347	78.5	0.163

Sample ID	LB-31-N40-SO8 (2')	LB-31-N40-SO8 (4')	LB-31-N40-SO8 (5')
Total PCBs (mg/kg)	95.3	2.14	ND<0.026

Sample ID	2017.09_SS31_4A (2')	2017.09_SS31_4A (4')	2017.09_SS31_4A (5')
Total PCBs (mg/kg)	0.714	4.54	0.302

Sample ID	2017.09_SS31_4B (3")	2017.09_SS31_4B (4')
Total PCBs (mg/kg)	0.0517	0.143

Sample ID	2017.09_SS31_5A (3")	2017.09_SS31_5A (2')
Total PCBs (mg/kg)	ND<0.0277	0.931

Sample ID	LB-31-N40-SO10 (3")	LB-31-N40-SO10 (2')	LB-31-N40-SO10 (4')
Total PCBs (mg/kg)	1.86	0.349	0.0441

Sample ID	LB-31-N40-SO9 (2')	LB-31-N40-SO9 (4')	LB-31-N40-SO9 (5')
Total PCBs (mg/kg)	9.71	3.07	ND<0.0265

Sample ID	SS-31-8A (3")	SS-31-8A (2')	SS-31-8A (4')
Total PCBs (mg/kg)	ND<0.309	0.308	0.0367

Sample ID	2017.09_SS31_6C (2')	2017.09_SS31_6C (4')	SS-31-6C (6')	SS-31-6C (7')	SS-31-6C (8')	SS-31-6C (9')
Total PCBs (mg/kg)	ND<0.028	89.6	8.25	16.4	27.4	0.332

Sample ID	2017.09_SS31_6B (3")	2017.09_SS31_6B (2')	2017.09_SS31_6B (4')	2017.09_SS31_6B (5')
Total PCBs (mg/kg)	ND<0.0288	1.75	1.06	ND<0.0282

Sample ID	SS-31-9A (4')	SS-31-9A (5')
Total PCBs (mg/kg)	2.17	0.282

Sample ID	2017.09_SS31_7B (2')	2017.09_SS31_7B (4')
Total PCBs (mg/kg)	1.5	0.893

Sample ID	LB-31-N30-SO3 (2')
Total PCBs (mg/kg)	ND<0.0322

Sample ID	2017.09_SS31_6A (2')	2017.09_SS31_6A (4')	2017.09_SS31_6A (5')
Total PCBs (mg/kg)	23.3	ND<0.0265	ND<0.0266

Sample ID	SS-31-10A (3")	SS-31-10A (4')
Total PCBs (mg/kg)	ND<0.0293	0.652

Sample ID	2017.09_SS31_7A (3")	2017.09_SS31_7A (2')
Total PCBs (mg/kg)	0.0679	0.143

Sample ID	SS-31-N20E10-3"	SS-31-N20E10-2'
Total PCBs (mg/kg)	0.115	0.14

Sample ID	SS-31-E20N10-3"	SS-31-E20N10-2'
Total PCBs (mg/kg)	ND<0.0347	0.437

Sample ID	SS-31-N20-3"	SS-31-N20-2'	SS-31-N20-4'
Total PCBs (mg/kg)	0.443	1.59	ND<0.0251

Sample ID	LB-31-S25E30-SO1 (2')
Total PCBs (mg/kg)	ND<0.0311

Sample ID	SS-31-E30-3"	SS-31-E30-2'
Total PCBs (mg/kg)	ND<0.0352	ND<0.0354

Sample ID	LB-31-S25E30-SO3 (2')
Total PCBs (mg/kg)	ND<0.031

Sample ID	SS-31-S25E30-3"	SS-31-S25E30-2'	SS-31-S25E30-3'
Total PCBs (mg/kg)	0.179	9.35	ND<0.0286

Sample ID	SS-31-E20-3"	SS-31-E20-2'	SS-31-E20-4'
Total PCBs (mg/kg)	ND<0.0308	5.68	ND<0.0267

Sample ID	LB-31-S25E30-SO5 (2')
Total PCBs (mg/kg)	ND<0.0268

Sample ID	SS-31-E20S10-3"	SS-31-E20S10-2'	SS-31-E20S10-3.5'
Total PCBs (mg/kg)	0.138	7.77	ND<0.028

Sample ID	SS-31-S20E10-3"	SS-31-S20E10-2'
Total PCBs (mg/kg)	ND<0.0345	0.177

Sample ID	SS-31-E10-3"	SS-31-E10-2'
Total PCBs (mg/kg)	5.51	0.325

Sample ID	SS-31-S20-3"	SS-31-S20-2'	SS-31-S20-3'
Total PCBs (mg/kg)	1.22	1.23	ND<0.0266

SS-1 SS-2 SS-3 SS-4 SS-5 SS-6 SS-7 SS-8 SS-9 SS-10 SS-11 SS-12 SS-13 SS-14 SS-15 SS-16 SS-17 SS-18 SS-19 SS-20 SS-21 SS-22 SS-23 SS-24 SS-25 SS-26 SS-27 SS-28 SS-29 SS-30 SS-31 SS-32 SS-33 SS-34 SS-35 SS-36 SS-37 SS-38 SS-39 SS-40 SS-41 SS-42 SS-43 SS-44 SS-45 SS-46 SS-47 SS-48 SS-49 SS-50 SS-51 SS-52 SS-53 SS-54 SS-55 SS-56 SS-57 SS-58 SS-59 SS-60 SS-61 SS-62 SS-63 SS-64 SS-65 SS-66 SS-67 SS-68 SS-69 SS-70

20 0 5 10 20
SCALE IN FEET

KEY MAP
SCALE: 1" = 250'

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG

NOTES

1. ALL SURFICIAL SOIL SAMPLES WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER.
2. FOR THE VERTICAL DELINEATION SOIL BORINGS ADVANCED AT THE PREVIOUS EXCEEDANCE LOCATIONS, SOIL SAMPLES WERE COLLECTED AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
3. FOR THE HORIZONTAL DELINEATION SOIL BORINGS, SOIL SAMPLES WERE COLLECTED WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER, AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
4. * = PCB CONCENTRATION APPROACHES RDEC OF 1 MG/KG NECESSITATING DELINEATION
5. MG/KG = MILLIGRAMS PER KILOGRAMS
6. NON = NON-DETECT
7. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA

ANALYTICAL RESULT TAG KEY

SOILS WITH PCBs > 1 MG/KG
SOILS WITH PCBs > 50 MG/KG

Sample ID	Sample # (Depth, "=inches, '=feet)
Total PCBs (mg/kg)	Concentration

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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
SS-31 PCB DELINEATION ANALYTICAL RESULTS MAP

Project No.	Drawing No.
140148201	3F
Date: FEBRUARY 2018	
Scale: 1"=20'	
Drawn By: JPH / Checked By: RJW	
Submission Date: FEBRUARY 2018	Sheet 3F of 11

SUBMISSION DATE: FEBRUARY 2018
PROJECT NO. 140148201

Sample ID	2017.09_SS37_4B (2')	2017.09_SS37_4B (3'10")
Total PCBs (mg/kg)	3.34	ND<0.0256

Sample ID	LB-37-N40-SO4 (2')	LB-37-N40-SO4 (4')
Total PCBs (mg/kg)	6.53	0.436

Sample ID	2017.09_SS37_3B (2')	2017.09_SS37_3B (4')	2017.09_SS37_3B (5')
Total PCBs (mg/kg)	1.3	7.74	0.189

Sample ID	2017.09_SS37_3A (2')	2017.09_SS37_3A (4')
Total PCBs (mg/kg)	11.9	ND<0.0262

Sample ID	SS-38-1A (8'-10')
Total PCBs (mg/kg)	ND<0.0286

Sample ID	LB-37-N40-SO5 (2')	LB-37-N40-SO5 (4')	LB-37-N40-SO5 (5')	LB-37-N40-SO5 (6')
Total PCBs (mg/kg)	0.154	3.52	7.62	ND<0.0441

Sample ID	2017.09_SS37_2A (2')	2017.09_SS37_2A (4')	2017.09_SS37_2A (5')
Total PCBs (mg/kg)	1.96	16.4	0.395

Sample ID	2017.09_SS37_2B (2')	2017.09_SS37_2B (4')
Total PCBs (mg/kg)	1.52	0.6

Sample ID	2017.09_SS37_1A (2')	2017.09_SS37_1A (4')	2017.09_SS37_1A (5')	2017.09_SS37_1A (6')
Total PCBs (mg/kg)	0.656	1.26	4.07	ND<0.0332

Sample ID	2017.09_SS37_1B (4')	2017.09_SS37_1B (5')
Total PCBs (mg/kg)	1.39	ND<0.0254

Sample ID	LB-37-N20W20-SO4 (3")	LB-37-N20W20-SO4 (2')
Total PCBs (mg/kg)	ND<0.0334	0.141

Sample ID	LB-37-N20W20-SO3 (2')
Total PCBs (mg/kg)	0.213

Sample ID	SS-37-N20W10-3"	SS-37-N20W10-5'
Total PCBs (mg/kg)	ND<0.0332	0.82

Sample ID	LB-37-N20W20-SO2 (2')	DUP-1-6.8.17
Total PCBs (mg/kg)	0.533	0.503

Sample ID	SS-37-N20W20-2'	SS-37-N20W20-4'
Total PCBs (mg/kg)	9.25	0.0507

Sample ID	SS-37-W20N10-3"	SS-37-W20N10-2'	SS-37-W20N10-4'
Total PCBs (mg/kg)	ND<0.0312	11.8	0.113

Sample ID	SS-37-W30-3"	SS-37-W30-2'
Total PCBs (mg/kg)	ND<0.0328	0.765

Sample ID	SS-37-W20-3"	SS-37-W20-2'	SS-37-W20-4'
Total PCBs (mg/kg)	1.88	123	ND<0.0255

Sample ID	SS-37-W20S10-3"	SS-37-W20S10-2'
Total PCBs (mg/kg)	0.0633	0.258

Sample ID	SS-37-W10-3"	SS-37-W10-2'
Total PCBs (mg/kg)	11.4	0.386

Sample ID	SS-37-S20W10-3"	SS-37-S20W10-2'
Total PCBs (mg/kg)	ND<0.0321	0.414

Sample ID	SS-37-S10-3"	SS-37-S10-2'
Total PCBs (mg/kg)	318	0.491

Sample ID	SS-37-S20-3"	SS-37-S20-2'	SS-37-S20-4'
Total PCBs (mg/kg)	0.821	3.17	0.101

Sample ID	2017.09_SS37_4A (2')	2017.09_SS37_4A (4')
Total PCBs (mg/kg)	1.07	ND<0.0249

Sample ID	LB-37-N40-SO3 (2')	LB-37-N40-SO3 (4')
Total PCBs (mg/kg)	25.8	0.161

Sample ID	LB-37-N40-SO2 (1.5')
Total PCBs (mg/kg)	44.2

Sample ID	LB-37-N40-SO1 (2')	LB-37-N40-SO1 (3.5')
Total PCBs (mg/kg)	13.8	543

Sample ID	SS-37-N40-3"	SS-37-N40-2'	SS-37-N40-4'	SS-37-N40-5'
Total PCBs (mg/kg)	0.0952	18.9	20.2	0.222

Sample ID	SS-37-N30-3"	SS-37-N30-5'	SS-37-N30-6'
Total PCBs (mg/kg)	0.0801	11.2	0.0426

Sample ID	SS-37-N20-3"	SS-37-N20-2'	SS-37-N20-4'	SS-37-N20-5'	SS-37-N20-6'
Total PCBs (mg/kg)	4.39	1.78	1.51	2.98	0.587

Sample ID	SS-37-N20E20-3"	SS-37-N20E20-2'
Total PCBs (mg/kg)	0.38	ND<0.0294

Sample ID	SS-37-N20E10-3"	SS-37-N20E10-2'	SS-37-N20E10-5'
Total PCBs (mg/kg)	1.65	0.42	0.0301

Sample ID	SS-37-N10-3"	SS-37-N10-2'	SS-37-N10-4'
Total PCBs (mg/kg)	250	1.12	0.477

Sample ID	SS-37-E20-3"	SS-37-E20-2'	SS-37-E20-3'	SS-37-E20-5'
Total PCBs (mg/kg)	1.43	1*	2.96	1.04

Sample ID	SS-37-E10-3"	SS-37-E10-2'	SS-37-E10-4'
Total PCBs (mg/kg)	0.293	3.02	0.397

Sample ID	SS-37	SS-37-1'	SS-37-1' (DUP)	SS-37-2'	SS-37-4'
Total PCBs (mg/kg)	5.03	174	124	12.7	0.446

Sample ID	SS-37-S20E10-3"	SS-37-S20E10-2'
Total PCBs (mg/kg)	0.0563	0.161

Sample ID	SS-37-S30-3"	SS-37-S30-2'
Total PCBs (mg/kg)	0.0728	0.27

KEY MAP
SCALE: 1" = 250'

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
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7. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA

ANALYTICAL RESULT TAG KEY

SOILS WITH PCBs > 1 MG/KG
SOILS WITH PCBs > 50 MG/KG

Sample ID	Sample # (Depth, "=inches, '=feet)
Total PCBs (mg/kg)	Concentration

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
SS-37 PCB DELINEATION ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 3G
Date FEBRUARY 2018	
Scale 1"=20'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 3G of 11

SUBMISSION DATE: FEBRUARY 2018
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-Design\Files\140148201-Western Middle School_PCB Excavation Exents_2017.10.30.dwg Date: 2/27/2018 Time: 11:27 User: jhall Style Table: Langan.stb Layout: SS-37 Excavation Extents

SEE FIGURE 6 FOR DELINEATION RESULTS FOR SS-28

SEE FIGURE 7 FOR DELINEATION RESULTS FOR SS-31

SEE FIGURE 8 FOR DELINEATION RESULTS FOR SS-37

SB-3 (2-2.5')	DUP-1 (SB-3 (2-2.5'))
0.0533	0.104

SS-28 (3")
1.09

SB-9 (3")	SB-9 (1')
ND<0.0283	ND<0.0278

SS-70 (3")	SS-70 (1')
ND<0.0333	ND<0.0299

SS-57 (3")	SS-57 (1')
ND<0.0333	0.2

SS-48 (3")	SS-48 (1')
ND<0.0326	0.565

SS-52 (3")	SS-52 (6")	SS-52 (1')
ND<0.0279	ND<0.0276	ND<0.0283

SS-47 (3")	SS-47 (1')
ND<0.0305	ND<0.0295

SS-46 (3")	SS-46 (1')
ND<0.0322	ND<0.0283

SS-45 (3")	SS-45 (1')
ND<0.0322	ND<0.0289

SS-39 (3")	SS-39 (1')
ND<0.0322	ND<0.0307

SS-40 (3")	SS-40 (1')
0.0667	0.561

SS-38 (3")
0.742

SS-41 (3")	SS-41 (1')
ND<0.0319	0.0361

SS-36 (3")
0.0457

SS-33 (3")
0.0519

SS-42 (3")	SS-42 (1')
ND<0.0375	ND<0.0296

SS-43 (3")	SS-43 (1')
ND<0.0339	3.62

SS-37 (3")
5.03

SB-11 (3")	SB-11 (1')
ND<0.0283	0.162

SB-10 (3")	SB-10 (1')
ND<0.0288	ND<0.0265

SS-71 (3")	SS-71 (1')
ND<0.0334	0.0532

SB-8 (3")	SB-8 (1')
ND<0.03	ND<0.0271

SS-27 (3")
0.15

SS-24 (3')
0.531

SB-7 (3")	SB-7 (1')
ND<0.0285	ND<0.0274

SS-69 (3")	DUP-4_6.9.17 (SS-69 (3"))	SS-69 (1')
ND<0.0307	ND<0.0295	ND<0.0297

SS-68 (3")	SS-68 (1')
ND<0.0313	ND<0.029

SS-31 (3")
0.965

SS-32 (3")
ND<0.0263

SS-30 (3")
ND<0.0358

SS-49 (3")	SS-49 (6")	SS-49 (1')
ND<0.0285	ND<0.0285	ND<0.0274

SS-35 (3")
0.237

SS-50 (3")	SS-50 (6")	SS-50 (1')
ND<0.0264	ND<0.0275	ND<0.0276

SB-2 (2-2.5')
0.275

SS-72 (3")	SS-72 (1')
ND<0.0349	ND<0.0295

SS-59 (3")	SS-59 (1')
ND<0.0357	ND<0.03

SS-44 (3")	SS-44 (1')
0.0348	ND<0.0285

SS-34 (3")
ND<0.0282

SB-5 (3")	SB-5 (1')
ND<0.0269	ND<0.0273

SS-23 (3")
ND<0.0401

SS-26 (3")	DUP (SS-26 (3"))
0.0996	0.094

SS-58 (3")	SS-58 (1')
ND<0.0305	1.54

SB-1 (2-2.5')
ND<0.0267

SB-6 (3")	SB-6 (1')	DUP (SB-6 (1'))
ND<0.0289	ND<0.0285	ND<0.0279

SS-78 (3")	SS-78 (1')
ND<0.0327	ND<0.0329

SS-20 (3")
0.529

SS-73 (3")	SS-73 (1')
ND<0.0339	0.197

SS-67 (3")	SS-67 (1')
ND<0.0338	0.0473

SS-29 (3")
ND<0.0313

SS-60 (3")	SS-60 (1')
ND<0.0302	0.0525

SS-51 (3")	SS-51 (6")	SS-51 (1')
ND<0.0267	ND<0.0266	ND<0.0273

SB-4 (3")	SB-4 (1')
ND<0.0294	ND<0.0272

SS-74 (3")	SS-74 (1')
ND<0.0335	0.306

SS-87 (3")	SS-87 (1')
ND<0.0306	0.693

SS-19 (3")
ND<0.0339

SS-22 (3")
ND<0.0317

SS-66 (3")	SS-66 (1')
ND<0.029	ND<0.0282

SS-63 (3")	SS-63 (6")	SS-63 (1')
ND<0.0256	ND<0.0265	0.623

SS-56 (3")	SS-56 (6")	SS-56 (1')
ND<0.0275	ND<0.0269	ND<0.0268

SS-53 (3")	SS-53 (6")	SS-53 (1')
ND<0.0267	ND<0.0267	ND<0.0278

SS-75 (3")	SS-75 (1')
0.0481	0.664

SS-86 (3")	SS-86 (1')
ND<0.0355	2.52

SS-79 (3")	SS-79 (1')
ND<0.0326	0.699

SS-16 (3")
0.424

SS-61 (3")	SS-61 (1')
ND<0.032	ND<0.0327

SS-25 (3")
0.0906

SS-55 (3")	SS-55 (6")	SS-55 (1')
ND<0.0263	ND<0.027	ND<0.0278

SS-76 (3")	SS-76 (1')
ND<0.031	ND<0.0274

SS-15 (3")
0.088

SS-12 (3")
0.477

SS-88 (3")	SS-88 (1')
ND<0.0318	0.229

SS-85 (3")	SS-85 (1')
ND<0.0299	0.71

SS-21 (3")
0.199

SS-62 (3")	SS-62 (1')
ND<0.0337	ND<0.0314

SS-54 (3")	SS-54 (1')
ND<0.027	ND<0.0264

SS-77 (3")	SS-77 (1')
ND<0.0327	ND<0.0313

SS-91 (3")	SS-91 (1')
ND<0.0358	0.59

SS-18 (3")
0.0536

SS-83 (3")	SS-83 (1')
ND<0.0376	ND<0.031

SS-89 (3")	SS-89 (1')
ND<0.0327	ND<0.0298

SS-11 (3")
0.279

SS-64 (3")	SS-64 (1')
ND<0.0311	0.271

SS-65 (3")	SS-65 (1')
ND<0.0302	0.529

SS-14 (3")	DUP-1 (SS-14 (3"))
0.0936	0.15

SS-17 (3")
0.0988

SS-90 (3")	SS-90 (1')
ND<0.0268	0.766

SS-80 (3")	SS-80 (1')
ND<0.029	0.286

SS-13 (3")
ND<0.0308

SS-93 (3")	SS-93 (1')
ND<0.0299	ND<0.0306

SS-10 (3")
ND<0.0394

SS-94 (3")	SS-94 (1')
ND<0.0361	0.927

SS-81 (3")	SS-81 (1')
ND<0.0305	3.35

SS-92 (3")	SS-92 (1')
ND<0.0295	0.388

SS-84 (3")	DUP-2_6.9.17 (SS-84 (3"))	SS-84 (1')
ND<0.0343	ND<0.0345	0.376

SS-9 (3")
ND<0.00259

SS-105 (3")	DUP-3_6.9.17 (SS-105 (3"))	SS-105 (1')
ND<0.0288	ND<0.0272	2.61

SS-82 (3")	SS-82 (1')
ND<0.033	ND<0.031

SS-96 (3")	SS-96 (1')
ND<0.0291	21.7

SS-101 (3")	SS-101 (6")	SS-101 (1')
ND<0.027	0.0415	0.0383

SS-95 (3")	SS-95 (1')
ND<0.035	ND<0.031

SS-100 (3")	SS-100 (6")	SS-100 (1')
ND<0.0281	ND<0.0305	0.0336

SS-99 (3")	SS-99 (6")	SS-99 (1')
ND<0.0268	ND<0.0289	0.0956

SS-102 (3")	SS-102 (6")	SS-102 (1')
ND<0.0269	ND<0.0297	0.815

SS-98 (3")	SS-98 (6")	SS-98 (1')
ND<0.0269	ND<0.0299	0.584

SS-104 (3")	SS-104 (1')
ND<0.0318	1.91

SS-103 (3")	SS-103 (6")	SS-103 (1')
ND<0.0264	ND<0.0285	7.1

SS-97 (3")	SS-97 (6")	SS-97 (1')
ND<0.0267	ND<0.0288	ND<0.0288

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. SURFICIAL SOIL SAMPLES WERE COLLECTED AT 3 INCHES BELOW TOPSOIL COVER AND 1 FOOT BELOW TOPSOIL COVER.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
3. MG/KG = MILLIGRAMS PER KILOGRAM
4. ND = NON-DETECT
5. PCB = POLYCHLORINATED BIPHENYLS

ANALYTICAL RESULT TAG KEY

SOILS WITH PCBs > 1 MG/KG

SOILS WITH PCBs > 50 MG/KG

Sample ID with Sample Depth ("=inches, '=feet)

Total PCBs Concentration in mg/kg

25 0 5 10 15 20 25
SCALE IN FEET

SUBMISSION DATE: FEBRUARY 2018

PROJECT NO. 140148201

LANGAN

LANGAN
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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: SURFICIAL SOIL PCB ANALYTICAL RESULTS MAP

Project No: 140148201
Date: FEBRUARY 2018
Scale: 1" = 25'
Drawn By: JPH
Checked By: RJW
Submission Date: FEBRUARY 2018

Drawing No. 3H
Sheet 3H of 11

Sample ID	HA-SS-21_0-0.25	HA-SS-21_0.5-1	HA-SS-21_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	ND

Sample ID	HA-SS-19_0-0.25	HA-SS-19_0.5-1	HA-SS-19_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0320	0.165	1.11

Sample ID	SS-36	SS-36_1-2	SS-36_2-3	SS-36_3-4	SS-36_4-5	SS-36_5-6	SS-36_6-7	SS-36_7-8
Sample Depth	0-0.25	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Sample Date	7/27/2016	10/15/2018	10/15/2018	10/15/2018	10/15/2018	10/15/2018	10/15/2018	10/15/2018
Pesticides (mg/kg)								
Chlordane	0.778	0.514	0.0833	ND	ND	ND	ND	ND
Metals (mg/kg)								
Arsenic	5.86	20	12.5	8.47	6.59	4.8	5.22	5.34
Lead	110	3,260	1,380	3,590	391	23.9	32.8	90.6
PCBs (mg/kg)								
Total PCBs	0.0457	1.02	0.0609	NT	NT	NT	NT	NT

Sample ID	HA-SS-17_0-0.25	HA-SS-17_0.5-1	HA-SS-17_1-1.5	Dup-3
Sample Depth	0-0.25	0.5-1	1-1.5	HA-SS-17_1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)				
Total PCBs	0.478	0.745	0.404	0.444

Sample ID	HA-SS-22_0-0.25	HA-SS-22_0.5-1	HA-SS-22_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	0.0478	2.71

Sample ID	HA-SS-20_0-0.25	HA-SS-20_0.5-1	HA-SS-20_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.472

Sample ID	HA-SS-18_0-0.25	HA-SS-18_0.5-1	HA-SS-18_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0341	0.187	1.39

Sample ID	HA-SS-15_0-0.25	HA-SS-15_0.5-1	HA-SS-15_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.484	0.688	0.282

Sample ID	SS-43 (3")	SS-43 (1')	SS-43_1-2
Sample Depth	0-0.25	0.75-1	1-2
Sample Date	6/9/2017	6/9/2017	10/16/2018
PCBs (mg/kg)			
Total PCBs	ND	3.62	0.559

Sample ID	SS-23_0-0.25	SS-23_0.5-1	SS-23_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.204

Sample ID	HA-SS-24_0-0.25	HA-SS-24_0.5-1	HA-SS-24_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.461

Sample ID	SS-58 (3")	SS-58 (1')	SS-58_1-2	SS-58_2-3
Sample Depth	0-0.25	0.75-1	1-2	2-3
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
SVOCs (mg/kg)				
Benzo(a)anthracene	NT	NT	1.5	25.6
Benzo(a)pyrene	NT	NT	1.54	24
Benzo(b)fluoranthene	NT	NT	1.23	18.8
Benzo(k)fluoranthene	NT	NT	1.21	20.8
Pyrene	NT	NT	2.25	52.2
Pesticides (mg/kg)				
Dieldrin	NT	NT	0.21	ND
Metals (mg/kg)				
Arsenic	NT	NT	26	16.6
Lead	NT	NT	4,970	1,250
PCBs (mg/kg)				
Total PCBs	ND	1.54	8.72	0.631

Sample ID	SS-39
Sample Depth	0-0.25
Sample Date	7/27/2016
PCBs (mg/kg)	
Total PCBs	0.0457

Sample ID	SS-40
Sample Depth	0-0.25
Sample Date	7/27/2016
PCBs (mg/kg)	
Total PCBs	0.0457

Sample ID	SS-11_0-0.25	HA-SS-11_0.5-1	HA-SS-11_1-1.5	Dup-2
Sample Depth	0-0.25	0.5-1	1-1.5	HA-SS-11_1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018	10/17/2018
PCBs (mg/kg)				
Total PCBs	0.978	10.1	2.01	3.4

Sample ID	HA-SS-13_0-0.25	HA-SS-13_0.5-1	HA-SS-13_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.298	0.696	7.4

Sample ID	HA-SS-12_0-0.25	HA-SS-12_0.5-1	HA-SS-12_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.218	0.702	7.16

Sample ID	HA-SS-14_0-0.25	HA-SS-14_0.5-1	HA-SS-14_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.118	0.141	0.0548

Sample ID	HA-SS-16_0-0.25	HA-SS-16_0.5-1	HA-SS-16_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.206	0.0806	0.154

Sample ID	SS-32	SS-32_1-2	SS-32_2-3	SS-32_3-4	SS-32_4-5
Sample Depth	0-0.25	1-2	2-3	3-4	4-5
Sample Date	7/27/2016	10/16/2018	10/16/2018	10/16/2018	10/16/2018
VOCs (mg/kg)					
Trichloroethylene	NT	NT	3.7	NT	NT
Metals (mg/kg)					
Arsenic	3.49	23.2	43.6	15.9	3.81
Lead	7.74	3,640	22,900	2,290	39.3
Vanadium	20.8	133	NT	486	91.1
PCBs (mg/kg)					
Total PCBs	ND	172	40	1.6	1.35

Sample ID	SS-61 (3")	SS-61 (1')	SS-61_1-2	SS-61_2-3	SS-61_3-4	SS-61_4-5
Sample Depth	0-0.25	0.75-1	1-2	2-3	3-4	4-5
Sample Date	6/9/2018	6/9/2018	10/16/2018	10/16/2018	10/16/2018	10/16/2018
Pesticides (mg/kg)						
Dieldrin	NT	NT	0.0107	NT	NT	NT
Heptachlor epoxide	NT	NT	0.0342	NT	NT	NT
Metals (mg/kg)						
Arsenic	NT	NT	17.1	16.9	29.7	15
Lead	NT	NT	1,760	2,260	2,650	2,100
PCBs (mg/kg)						
Total PCBs	ND	ND	0.221	NT	NT	NT

Sample ID	SS-81 (3")	SS-81 (1')	SS-81_1-2	SS-81_2-3	SS-81_3-4
Sample Depth	0-0.25	0.75-1	1-2	2-3	3-4
Sample Date	6/9/2018	6/9/2018	10/16/2018	10/16/2018	10/16/2018
VOCs (mg/kg)					
Trichloroethylene	NT	NT	7.5	NT	NT
Metals (mg/kg)					
Arsenic	NT	NT	22.8	15.8	5.53
Lead	NT	NT	3,010	13,700	1,230
PCBs (mg/kg)					
Total PCBs	ND	3.35	0.681	NT	NT

Sample ID	SS-86 (3")	SS-86 (1')	SS-86_1-2	SS-86_2-2.5	SS-86_2.5-3
Sample Depth	0-0.25	0.75-1	1-2	2-2.5	2.5-3
Sample Date	6/9/2017	6/9/2017	10/15/2018	10/15/2018	10/15/2018
VOCs (mg/kg)					
Tetrachloroethylene	NT	NT	2.7	NT	NT
Trichloroethylene	NT	NT	53	NT	NT
Pesticides (mg/kg)					
Dieldrin	NT	NT	0.00916	NT	NT
Metals (mg/kg)					
Antimony	NT	NT	58.5	ND	ND
Arsenic	NT	NT	18.2	8.31	2.8
Cadmium	NT	NT	38.9	8.58	0.586
Copper	NT	NT	2,600	502	27.3
Lead	NT	NT	3,440	1,720	17.4
PCBs (mg/kg)					
Total PCBs	ND	2.52	0.194	NT	NT

Sample ID	SS-11	SS-11_1-2
Sample Depth	0-0.25	1-2
Sample Date	7/27/2016	10/15/2018
PCBs (mg/kg)		
Total PCBs	0.279	0.368

Sample ID	SS-95 (3")	SS-95 (1')	SS-95_1-2
Sample Depth	0-0.25	0.75-1	1-2
Sample Date	6/9/2017	6/9/2017	10/16/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.516

Sample ID	SS-105 (3")	SS-105 (1')	SS-105_1-2	DUP_1
Sample Depth	0-0.25	0.75-1	1-2	SS-105_1-2
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
VOCs (mg/kg)				
Acetone	NT	NT	ND	0.021
SVOCs (mg/kg)	NT	NT	ND	ND
Pesticides (mg/kg)	NT	NT	ND	ND
Herbicides (mg/kg)	NT	NT	ND	ND
ETPH (mg/kg)	NT	NT	ND	ND
Metals (mg/kg)	NT	NT	NE	NE
PCBs (mg/kg)				
Total PCBs	ND	2.61	0.0633	ND

Sample ID	HA-SS-1_0-0.25	HA-SS-1_0.5-1	HA-SS-1_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	0.633	1.35

Sample ID	HA-SS-2_0-0.25	HA-SS-2_0.5-1	HA-SS-2_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.0598

Sample ID	SS-104 (3")	SS-104 (1')	SS-104_1-2	SS-104_2-3
Sample Depth	0-0.25	0.75-1	1-2	2-3
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
PCBs (mg/kg)				
Total PCBs	ND	1.91	5.08	ND

Sample ID	HA-SS-3_0-0.25	HA-SS-3_0.5-1	HA-SS-3_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0792	0.475	1.24

Sample ID	HA-SS-4_0-0.25	HA-SS-4_0.5-1	HA-SS-4_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.131

Sample ID	SS-103 (3")	SS-103 (1')	SS-103_1-2	SS-103_2-3	SS-103_3-4	SS-103_4-5	SS-103_5-6
Sample Depth	0-0.25	0.75-1	1-2	2-3	3-4	4-5	5-6
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018	10/16/2018	10/16/2018	10/16/2018
PCBs (mg/kg)							
Total PCBs	ND	ND	2.48	2.9	ND	ND	0.251

Sample ID	HA-SS-6_0-0.25	HA-SS-6_0.5-1	HA-SS-6_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	ND

Sample ID	HA-SS-5_0-0.25	HA-SS-5_0.5-1	HA-SS-5_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0867	1.27	0.732

Sample ID	SS-9_0-0.25	HA-SS-9_0.5-1	HA-SS-9_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	0.436	0.765

Sample ID	HA-SS-10_0-0.25	HA-SS-10_0.5-1	HA-SS-10_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.192

Sample ID	SS-96 (3")	SS-96 (1')	SS-96_1-2	SS-96_2-3
Sample Depth	0-0.25	0.75-1	1-2	2-3
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
PCBs (mg/kg)				
Total PCBs	ND	21.7	3.3	ND

Sample ID	HA-SS-7_0-0.25	HA-SS-7_0.5-1	HA-SS-7_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0844	0.621	1.12

Sample ID	HA-SS-8_0-0.25	HA-SS-8_0.5-1	HA-SS-8_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.211

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1–FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1–FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. ONLY PCB RESULTS AND EXCEEDANCES OF THE CTDEEP RSR RESIDENTIAL DIRECT EXPOSURE CRITERIA AND POLLUTANT MOBILITY CRITERIA FOR GB ARE SHOWN.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
3. MG/KG = MILLIGRAMS PER KILOGRAM
4. MG/L = MILLIGRAMS PER LITER
5. ND = NON-DETECT
6. NT = NOT TESTED
7. NE = NOT EXCEEDING CRITERIA
8. PCB = POLYCHLORINATED BIPHENYLS
9. VOCs = VOLATILE ORGANIC COMPOUNDS
10. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS

ANALYTICAL RESULT TAG KEY

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria
VOCs	mg/kg	mg/kg
Tetrachloroethylene	12	1
Trichloroethylene	56	1
SVOCs	mg/kg	mg/kg
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	8.4	1
Pyrene	1,000	40
Pesticides	mg/kg	mg/kg
Chlordane	0.49	0.066
Dieldrin	0.038	0.007
Heptachlor epoxide	0.067	0.02
Metals	mg/kg	mg/L
Antimony	27	~
Arsenic	10	~
Cadmium	34	~
Copper	2,500	~
Lead	400	~
Vanadium	470	~
PCBs	mg/kg	mg/L
Total PCBs	1	~

Bold indicates an exceedance of the Pollutant Mobility Criteria

Shaded indicates an exceedance of the Residential Direct Exposure Criteria

SCALE IN FEET

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: OCTOBER 2018 SOIL INVESTIGATION ANALYTICAL RESULTS MAP

Project No. 140148201
Date JANUARY 2019
Drawn By JPH
Checked By RJW
Drawing No. 31
Sheet 31 of 11

LANGAN
PROJECT NO. 140148201

Sample ID	MW-2
Sampling Date	10/30/2018
VOCs (ug/L)	
cis-1,2-Dichloroethylene	5
Tetrachloroethylene	2.1
trans-1,2-Dichloroethylene	3.3
Trichloroethylene	43
ETPH (ug/L)	
ETPH (Extractable Total Petroleum Hydrocarbons)	106
Dissolved Metals (ug/L)	
Barium	93.3
Copper	1.34
Nickel	3.46
Zinc	8.59
PCBs (ug/L)	
Total PCBs	ND

Sample ID	MW-4
Sampling Date	10/30/2018
PCBs (ug/L)	
Total PCBs	ND

Sample ID	MW-3	DUP-01
Sampling Date	10/30/2018	10/30/2018
VOCs (ug/L)		
cis-1,2-Dichloroethylene	15	15
Tetrachloroethylene	3.4	3.4
trans-1,2-Dichloroethylene	3.7	3.7
Trichloroethylene	38	38
ETPH (ug/L)		
ETPH (Extractable Total Petroleum Hydrocarbons)	109	98
Dissolved Metals (ug/L)		
Antimony	1.32	1.23
Barium	101	105
Copper	4.27	4.32
Nickel	1.54	1.38
Selenium	6.52	3.9
Vanadium	2.18	2.13
Zinc	11.9	7.77
PCBs (ug/L)		
Total PCBs	ND	ND

Sample ID	MW-1
Sampling Date	10/30/2018
VOCs (ug/L)	
Chloroform	0.53
cis-1,2-Dichloroethylene	12
Tetrachloroethylene	3.5
trans-1,2-Dichloroethylene	1.9
Trichloroethylene	31
ETPH (ug/L)	
ETPH (Extractable Total Petroleum Hydrocarbons)	122
Dissolved Metals (ug/L)	
Barium	91.8
Copper	1.48
Nickel	2.55
Selenium	2.57
Zinc	11.1
PCBs (ug/L)	
Total PCBs	ND

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1-FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1-FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. ONLY DETECTIONS ARE SHOWN.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
3. UG/L = MICROGRAMS PER LITER
4. ND = NON-DETECT
5. PCB = POLYCHLORINATED BIPHENYLS
6. VOCs = VOLATILE ORGANIC COMPOUNDS
7. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
8. ETPH = EXTRACTABLE TOTAL PETROLEUM HYDROCARBONS

ANALYTICAL RESULT TAG KEY

Compound	SWPC	GWVC
VOCs	ug/L	ug/L
Chloroform	14,100	287
cis-1,2-Dichloroethylene	6,200*	~
Tetrachloroethylene	88	1,500
trans-1,2-Dichloroethylene	10,000*	~
Trichloroethylene	2,340	219
ETPH	ug/L	~
ETPH (Extractable Total Petroleum Hydrocarbons)	~	~
Dissolved Metals	ug/L	~
Antimony	86,000	~
Barium	~	~
Copper	48	~
Nickel	880	~
Selenium	50	~
Vanadium	~	~
Zinc	123	~
PCBs	ug/L	~
Total PCBs	0.5	~

SWPC = Surface Water Protection Criteria
GWVC = Groundwater Volitilization Criteria

25 0 5 10 15 20 25
SCALE IN FEET

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: OCTOBER 2018 GROUNDWATER INVESTIGATION ANALYTICAL RESULTS MAP

Project No. 140148201
Date JANUARY 2019
Drawn By JPH
Checked By RJW
Drawing No. 3J
Sheet 3J of 11

PROJECT NO. 140148201

Filename: \langan.com\data\NY\Data2\140148201\Cadd Data - 140148201\2-Design Files\140148201-Western Middle School_2018 10_Soil Tag.dwg Date: 3/20/2019 Time: 17:42 User: jhall Style Table: Langan.stb Layout: GW TAG MAP

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria
VOCs	mg/kg	mg/kg
Acetone	500	140
Metals	mg/kg	mg/kg
Arsenic	10	~
Barium	4700	~
Cadmium	34	~
Chromium, Total	~	~
Copper	2500	~
Lead	400	~
Mercury	20	~
Nickel	1400	~
Vanadium	470	~
Zinc	20000	~

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Project
WESTERN MIDDLE SCHOOL
GREENWICH
FAIRFIELD COUNTY CT

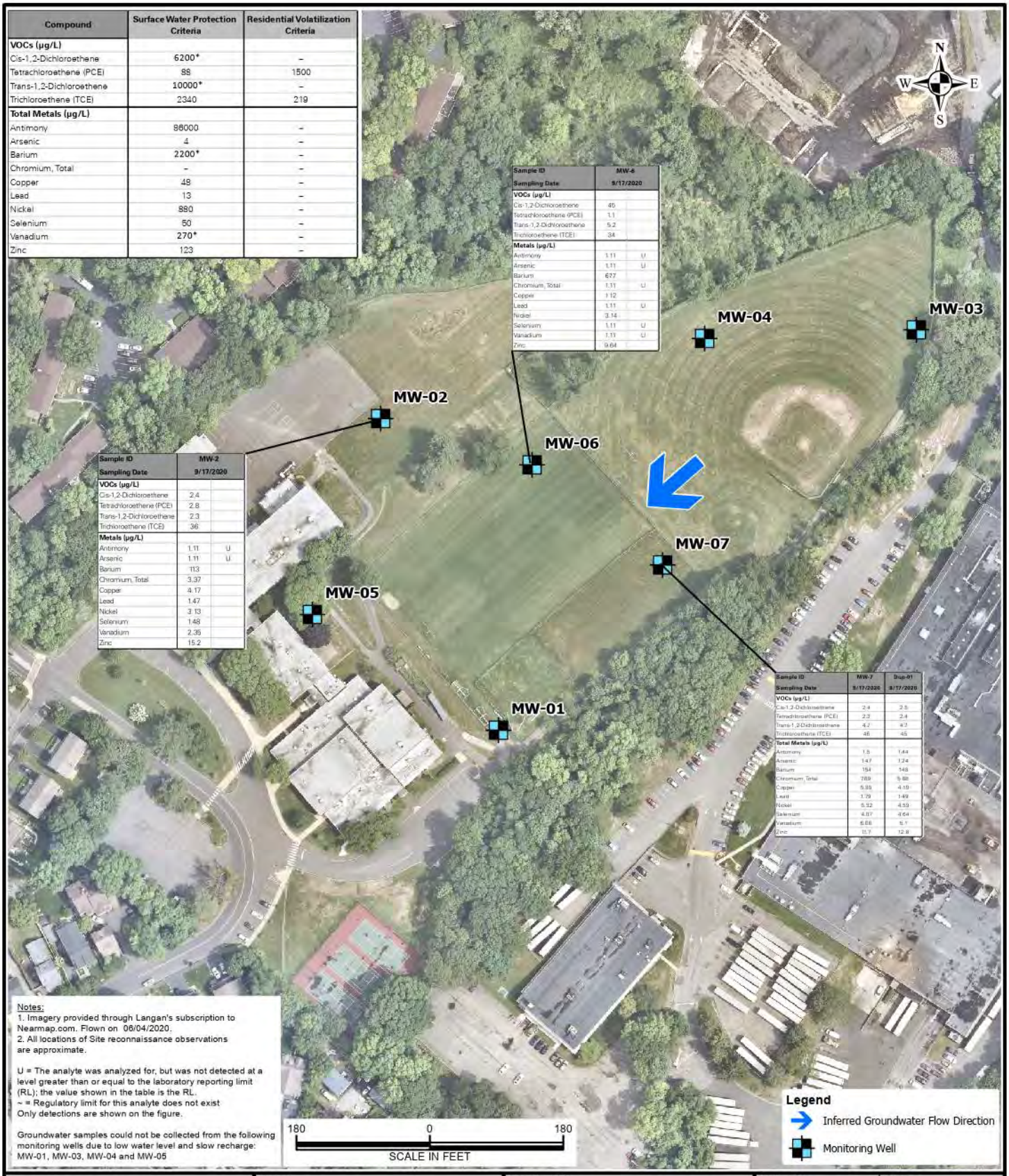
Drawing Title
SOIL ANALYTICAL RESULTS MAP

Project No. 140148201
Date 10/1/2020
Scale 1" = 150 feet
Drawn By LDB

Figure 3K

Sheet 3K of 11

Path: C:\Users\lbalch\Desktop\GIS_Projects\NHV\140148201\140148201\140148201.aprx



Compound	Surface Water Protection Criteria	Residential Volatilization Criteria
VOCs (µg/L)		
Cis-1,2-Dichloroethene	6200*	–
Tetrachloroethene (PCE)	88	1500
Trans-1,2-Dichloroethene	10000*	–
Trichloroethene (TCE)	2340	219
Total Metals (µg/L)		
Antimony	86000	–
Arsenic	4	–
Barium	2200*	–
Chromium, Total	–	–
Copper	48	–
Lead	13	–
Nickel	880	–
Selenium	50	–
Vanadium	270*	–
Zinc	123	–

Sample ID	MW-6	
Sampling Date	9/17/2020	
VOCs (µg/L)		
Cis-1,2-Dichloroethene	45	
Tetrachloroethene (PCE)	1.1	
Trans-1,2-Dichloroethene	5.2	
Trichloroethene (TCE)	34	
Metals (µg/L)		
Antimony	1.11	U
Arsenic	1.11	U
Barium	677	
Chromium, Total	1.11	U
Copper	1.12	
Lead	1.11	U
Nickel	3.14	
Selenium	1.11	U
Vanadium	1.11	U
Zinc	9.64	

Sample ID	MW-2	
Sampling Date	9/17/2020	
VOCs (µg/L)		
Cis-1,2-Dichloroethene	2.4	
Tetrachloroethene (PCE)	2.8	
Trans-1,2-Dichloroethene	2.3	
Trichloroethene (TCE)	36	
Metals (µg/L)		
Antimony	1.11	U
Arsenic	1.11	U
Barium	113	
Chromium, Total	3.37	
Copper	4.17	
Lead	1.47	
Nickel	3.13	
Selenium	1.48	
Vanadium	2.36	
Zinc	15.2	

Sample ID	MW-7	Dup-01
Sampling Date	9/17/2020	9/17/2020
VOCs (µg/L)		
Cis-1,2-Dichloroethene	2.4	2.5
Tetrachloroethene (PCE)	2.3	2.4
Trans-1,2-Dichloroethene	4.2	4.3
Trichloroethene (TCE)	46	45
Total Metals (µg/L)		
Antimony	1.5	1.44
Arsenic	1.47	1.24
Barium	154	148
Chromium, Total	7.89	5.88
Copper	5.35	4.19
Lead	1.79	1.49
Nickel	5.52	4.59
Selenium	4.87	4.64
Vanadium	6.66	5.1
Zinc	15.7	12.8

Notes:
1. Imagery provided through Langan's subscription to Nearmap.com. Flown on 06/04/2020.
2. All locations of Site reconnaissance observations are approximate.

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the laboratory reporting limit (RL); the value shown in the table is the RL.
~ = Regulatory limit for this analyte does not exist
Only detections are shown on the figure.

Groundwater samples could not be collected from the following monitoring wells due to low water level and slow recharge: MW-01, MW-03, MW-04 and MW-05

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Project
WESTERN MIDDLE SCHOOL
GREENWICH
FAIRFIELD COUNTY CT

Drawing Title
GROUNDWATER ANALYTICAL RESULTS MAP

Project No. 140148201
Date 10/1/2020
Scale 1" = 180 feet
Drawn By LDB

Figure 3L

Sheet 3L of 11

Path: C:\Users\lbalch\Desktop\GIS_Projects\NHV\140148201\140148201\140148201.aprx

Sample Name	SB-307A	SB-307B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	6-6.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.659**	ND
Chlordane (alpha and gamma)	**0.128**	ND
PCBs (mg/kg)		
Total PCBs	0.0597	ND
Metals (mg/kg)		
Lead	1,570	3.68

Sample Name	SB-306A	SB-306B
Sample Date	8/16/2021	
Sample Depth (ft bg)	1-1.5	4-4.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.012	0.0092
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0331**	**0.06039**
PCBs (mg/kg)		
Total PCBs	1.04	2.8
Metals (mg/kg)		
Lead	678	106

Sample Name	SB-305A	SB-305B
Sample Date	8/16/2021	
Sample Depth (ft bg)	1-1.5	3-3.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.023	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.5593**	ND
PCBs (mg/kg)		
Total PCBs	11	ND
Metals (mg/kg)		
Lead	923	3.79

Sample Name	SB-304A	SB-304B
Sample Date	8/16/2021	
Sample Depth (ft bg)	1-1.5	2-2.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Benzo(a)pyrene	1.1	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0611**	ND
Chlordane (alpha and gamma)	**0.221**	ND
PCBs (mg/kg)		
Total PCBs	1.5	ND
Metals (mg/kg)		
Antimony	48.2	3.63
Arsenic	32.1	3.83
Cadmium	191	1.26
Lead	2,220	231
Nickel	1,060	83.9

Sample Name	SB-303A	SB-303B
Sample Date	8/16/2021	
Sample Depth (ft bg)	2.5-3	5.5-6
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0497**	**0.02507**
Chlordane (alpha and gamma)	**0.0747**	ND
PCBs (mg/kg)		
Total PCBs	0.265	0.0634
Metals (mg/kg)		
Arsenic	11.9	5.2
Lead	943	112

Sample Name	SB-302A	SB-302B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	6.5-7
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0291**	ND
PCBs (mg/kg)		
Total PCBs	1.11	0.0737
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-301A	SB-301B
Sample Date	8/17/2021	
Sample Depth (ft bg)	1-1.5	5-5.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.027	0.0054
SVOCs (mg/kg)		
Benzo(a)anthracene	**1.6**	ND
Benzo(a)pyrene	**1.94**	ND
Benzo(b)fluoranthene	**1.59**	ND
Benzo(g,h,i)Perylene	**1.57**	ND
Benzo(k)fluoranthene	**1.52**	ND
Chrysene	**1.55**	ND
Indeno(1,2,3-cd)pyrene	**1.63**	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1721**	ND
PCBs (mg/kg)		
Total PCBs	0.153	ND
Metals (mg/kg)		
Lead	428	11.8

Sample Name	SB-332A	SB-332B
Sample Date	8/18/2021	
Sample Depth (ft bg)	0.5-1	2-3.5
VOCs (mg/kg)		
Methylene Chloride	ND	0.013
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	Detections BC	
PCBs (mg/kg)		
Total PCBs	0.436	0.0378
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-331A	SB-331B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	4-4.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1171**	ND
Chlordane (alpha and gamma)	**0.0863**	ND
PCBs (mg/kg)		
Total PCBs	0.0519	ND
Metals (mg/kg)		
Arsenic	14.1	7.59
Lead	1,250	126

Sample Name	SB-330A	SB-330B	DUP-SO2
Sample Date	8/18/2021		
Sample Depth (ft bg)	0.5-1	2-3	
VOCs (mg/kg)			
Methylene Chloride	ND	0.022	ND
SVOCs (mg/kg)			
Total SVOCs	ND	ND	ND
Pesticides/Herbicides (mg/kg)			
Total Pesticides/Herbicides	ND	ND	ND
PCBs (mg/kg)			
Total PCBs	ND	ND	0.0571
Metals (mg/kg)			
Total Metals	ND	ND	ND

Sample Name	SB-329A	SB-329B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	4-4.5
VOCs (mg/kg)		
Methylene Chloride	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.3797**	ND
Chlordane (alpha and gamma)	**0.454**	ND
Dieldrin	**0.0438**	ND
PCBs (mg/kg)		
Total PCBs	1.02	ND
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-328A	SB-328B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	2.5-3
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.7373**	**0.3282**
Dieldrin	**0.0445**	**0.0211**
PCBs (mg/kg)		
Total PCBs	2.19	0.465
Metals (mg/kg)		
Arsenic	14	9.85
Lead	701	663

Sample Name	SB-327A	SB-327B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	5-5.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Chlordane (alpha and gamma)	**0.189**	ND
PCBs (mg/kg)		
Total PCBs	2.05	ND
Metals (mg/kg)		
Arsenic	17.5	2.6
Lead	2,020	31.9

Sample Name	SB-326A	SB-326B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1.5-2	3-3.5
VOCs (mg/kg)		
Trichloroethene (TCE)	ND	0.037
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1536**	**0.8724**
Chlordane (alpha and gamma)	ND	**0.619**
Dieldrin	ND	**0.0397**
PCBs (mg/kg)		
Total PCBs	0.736	3.3
Metals (mg/kg)		
Arsenic	6.4	53.1
Lead	207	2,230

Sample Name	SB-325A	SB-325B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	4.5-5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.021	0.02
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0751**	ND
Chlordane (alpha and gamma)	**0.0676**	ND
PCBs (mg/kg)		
Total PCBs	0.515	0.289
Metals (mg/kg)		
Arsenic	12.5	5.01
Lead	2,650	128

Sample Name	SB-324A	SB-324B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	5-5.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0879**	ND
Chlordane (alpha and gamma)	**0.0865**	ND
PCBs (mg/kg)		
Total PCBs	0.227	ND
Metals (mg/kg)		
Lead	898	8.2

Sample Name	SB-323A	SB-323B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1.5-2	3-3.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1789**	**2.65**
Chlordane (alpha and gamma)	**0.256**	**0.983**
Dieldrin	**0.0176**	ND
PCBs (mg/kg)		
Total PCBs	1.94	5.46
Metals (mg/kg)		
Arsenic	6.18	16.7
Lead	154	1,660

Sample Name	SB-308	DUP_SO1
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-3	
VOCs (mg/kg)		
Trichloroethene	0.049	0.041
SVOCs (mg/kg)		
Benzo(a)anthracene	**2.3**	ND
Benzo(a)pyrene	**2.75**	ND
Benzo(b)fluoranthene	**2.25**	ND
Benzo(g,h,i)Perylene	**1.64**	ND
Benzo(k)fluoranthene	**2.21**	ND
Chrysene	**2.52**	ND
Indeno(1,2,3-cd)pyrene	**1.92**	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.07132**	**0.0355**
Chlordane (alpha and gamma)	**0.131**	ND
PCBs (mg/kg)		
Total PCBs	0.109	0.244
Metals (mg/kg)		
Lead	697	603

Sample Name	SB-309A	SB-309B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	3.5-4
VOCs (mg/kg)		
Trichloroethene (TCE)	0.038	0.04
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1611**	ND
Chlordane (alpha and gamma)	**0.301**	**1.37**
PCBs (mg/kg)		
Total PCBs	1.19	11.9
Metals (mg/kg)		
Copper	3,580	231
Lead	1,220	733

Sample Name	SB-310A	SB-310B
Sample Date	8/17/2021	
Sample Depth (ft bg)	1-1.5	3-3.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.024	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.04505**	ND
PCBs (mg/kg)		
Total PCBs	0.632	ND
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-311A	SB-311B
Sample Date	8/17/2021	
Sample Depth (ft bg)	1-2.5	5.5-6
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1017**	ND
Chlordane (alpha and gamma)	**0.238**	ND
PCBs (mg/kg)		
Total PCBs	1.14	0.434
Metals (mg/kg)		
Antimony	29.2	6.27
Arsenic	24.4	2.49
Lead	28,100	5.83

Sample Name	SB-312A	SB-312B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	5.5-6
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Benzo(a)anthracene	**1.85**	ND
Benzo(a)pyrene	**1.94**	ND
Benzo(b)fluoranthene	**1.7**	ND
Benzo(g,h,i)Perylene	**1.39**	ND
Benzo(k)fluoranthene	**1.59**	ND
Chrysene	**1.74**	ND
Indeno(1,2,3-cd)pyrene	**1.51**	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.5048**	ND
Chlordane (alpha and gamma)	**1.06**	ND
PCBs (mg/kg)		
Total PCBs	6.43	0.0343
Metals (mg/kg)		
Arsenic	17.8	4.64
Lead	2,640	31.6

Sample Name	SB-313A	SB-313B
Sample Date	8/23/2021	
Sample Depth (ft bg)	1-1.5	2.5-3
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	ND	**0.2436**
PCBs (mg/kg)		
Total PCBs	0.296	8.29
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-314A	SB-314B
Sample Date	8/17/2021	
Sample Depth (ft bg)	0.5-1	1.5-2
VOCs (mg/kg)		
Naphthalene	0.014	0.018
SVOCs (mg/kg)		
Benzo(a)anthracene	**21.7**	**8.71**
Benzo(a)pyrene	**19.3**	**7.51**
Benzo(b)fluoranthene	**15.6**	**5.89**
Benzo(g,h,i)Perylene	**10.8**	**4.28**
Benzo(k)fluoranthene	**15.3**	**6.47**
Chrysene	**18.6**	**7.45**
Dibenz(a,h)anthracene	**4.27**	**1.8**
Indeno(1,2,3-cd)pyrene	**12.7**	**5.53**
Phenanthrene	**45.9**	17
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.3212**	**0.1718**
PCBs (mg/kg)		
Total PCBs	2.07	1.42
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-315A	DUP-SO3	SB-315B
Sample Date	8/23/2021		
Sample Depth (ft bg)	1-1.5		2-2.5
VOCs (mg/kg)			
Total VOCs	ND	ND	ND
SVOCs (mg/kg)			
Benzo(a)anthracene	ND	**10.8**	ND
Benzo(a)pyrene	ND	**7.8**	ND
Benzo(g,h,i)Perylene	ND	**4.52**	ND
Benzo(k)fluoranthene	ND	**6.21**	ND
Chrysene	ND	**11**	ND
Dibenz(a,h)anthracene	ND	**1.71**	ND
Indeno(1,2,3-cd)pyrene	ND	**3.8**	ND
Pesticides/Herbicides (mg/kg)			
DDT (Total)	ND	**0.1724**	ND
PCBs (mg/kg)			
Total PCBs	6.68	8.91	4.69
Metals (mg/kg)			
Total Metals	Detections BC		

Sample Name	SB-316A	SB-316B
Sample Date	8/23/2021	
Sample Depth (ft bg)	1-1.5	3-3.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	0.498	0.381
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-318A	SB-318B
Sample Date	8/23/2021	
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	0.884	0.385
Metals (mg/kg)		
Arsenic	7.87	25.1

Sample Name	SB-319A	SB-319B
Sample Date	8/23/2021	
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Chlordane (alpha and gamma)	ND	**1.36**
PCBs (mg/kg)		
Total PCBs	1.52	12.8
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-317A	SB-317B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	5.5-6
VOCs (mg/kg)		
Trichloroethene (TCE)	0.039	0.012
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1125**	ND
Chlordane (alpha and gamma)	**0.254**	**0.0768**
Dieldrin	**0.0258**	ND
PCBs (mg/kg)		
Total PCBs	1.43	0.147
Metals (mg/kg)		
Arsenic	14	8.16
Lead	2,000	519

Sample Name	SB-320A	SB-320B
Sample Date	8/23/2021	
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1148**	ND
Chlordane (alpha and gamma)	ND	**0.69**
PCBs (mg/kg)		
Total PCBs	5.56	7.81
Metals (mg/kg)		
Antimony	4.35	34.4
Arsenic	7.43	12.7
Lead	1,820	5,890

Sample Name	SB-321A	SB-321B
Sample Date	8/18/2021	
Sample Depth (ft bg)	0.5-1	1.5-2
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Fluoranthene	ND	0.551
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	51.1	26.3
Metals (mg/kg)		
Lead	676	808

Sample Name	SB-322A	SB-322B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	2.5-3
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1751**	ND
PCBs (mg/kg)		
Total PCBs	8.54	36.6
Metals (mg/kg)		
Arsenic	7.69	11.1
Lead	181	648

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1–FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1–FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH
- 2021 SOIL BORING LOCATIONS
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- WESTERN MIDDLE SCHOOL PROPERTY LINE
- FENCE LINE
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
2. MG/KG = MILLIGRAMS PER KILOGRAM
3. MG/L = MILLIGRAMS PER LITER
4. ND = NON-DETECT
5. NT = NOT TESTED
6. NC = NOT EXCEEDING CRITERIA
7. PCB = POLYCHLORINATED BIPHENYLS
8. VOCs = VOLATILE ORGANIC COMPOUNDS
9. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS

Analyte	RDEC	I/CDEC	GB PMC
VOCs (mg/kg)			
Methylene Chloride	82	760	1
Trichloroethene (TCE)	56	520	1
SVOCs (mg/kg)			
Benzo(a)anthracene	1	7.8	1
Benzo(a)pyrene	1	1	1
Benzo(b)fluoranthene	1	7.8	1
Benzo(g,h,i)Perylene	8.4	78	1
Benzo(k)fluoranthene	8.4	78	1
Chrysene	84	780	1
Dibenz(a,h)anthracene	1	1	1
Fluoranthene	1,000	2,500	56
Indeno(1,2,3-cd)pyrene	1	7.8	1
Phenanthrene	1,000	2,500	40
Pesticides/Herbicides (mg/kg)			
4,4'-DDT	1.8	17	0.02
Chlordane (alpha and gamma)	0.49	2.2	0.066
Dieldrin	0.038	0.36	0.007
PCBs (mg/kg)			
Total PCBs	1	10	NS
Metals (mg/kg)			
Antimony	27	8,200	NS
Arsenic	10	10	NS
Cadmium	34	1,000	NS
Copper	2,500	76,000	NS
Lead	400	1,000	NS
Nickel	1,400	7,500	NS

Exceedance Summary:

10 - Result exceeds CTDEEP RSRs Residential Direct Exposure Criteria (RDEC)

10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria (I/CDEC)

10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria (PMC)

25 0 5 10 15 20 25
SCALE IN FEET

LANGAN
Langan CT, Inc.
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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: AUGUST 2021 ANALYTICAL SUMMARY PLAN

Project No. 140148201
Date AUGUST 2021
Drawn By JPH
Checked By RJW

Drawing No. 3M
Sheet 3M of 11

PROJECT NO. 140148201

Sample Name	SB-348
Sample Date	2/18/2022
Sample Depth (ft bg)	1-2
SVOCs (mg/kg)	
Benzo(a)anthracene	0.748
Benzo(a)pyrene	0.832
Benzo(b)fluoranthene	0.745
Benzo(k)fluoranthene	0.739
Chrysene	0.717
Fluoranthene	1.66
Indeno(1,2,3-cd)pyrene	0.636
Phenanthrene	0.684
Pyrene	1.26
Pesticides/Herbicides (mg/kg)	
4,4'-DDD	0.0192
4,4'-DDE	0.0253
4,4'-DDT	0.131
Chlordane (alpha and gamma)	**0.219**
Heptachlor epoxide	0.0141
Dieldrin	0.123
ETPH (mg/kg)	
ETPH	199
PCBs (mg/kg)	
Total PCBs	0.0558
Metals (mg/kg)	
Antimony	3.1
Arsenic	2.91
Barium	113
Cadmium	1.18
Chromium	37.3
Copper	103
Lead	338
Mercury	0.39
Nickel	30.1
Silver	1.36
Vanadium	35.8
Zinc	236

Sample Name	SB-349
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.25
VOCs (mg/kg)	
Methylene Chloride	0.014
Metals (mg/kg)	
Antimony	7.72
Arsenic	2.71
Barium	167
Cadmium	0.881
Chromium	73.8
Copper	62
Lead	75.4
Mercury	0.0808
Nickel	33.8
Silver	1.63
Vanadium	54.8
Zinc	143

Sample Name	SB-352A	SB-352B
Sample Date	2/18/2022	2/18/2022
Sample Depth (ft bg)	0.5-1	1.25-1.5
VOCs (mg/kg)		
Methylene Chloride	0.11	0.011
Pesticides/Herbicides (mg/kg)		
4,4'-DDT	0.00643	ND
Chlordane (alpha and gamma)	0.0419	ND
Dieldrin	0.327	0.231
ETPH (mg/kg)		
ETPH	188	73.5
Metals (mg/kg)		
Antimony	5.59	5.66
Arsenic	18.1	6.48
Barium	250	175
Cadmium	0.441	0.458
Chromium	42.4	41.2
Copper	46	46.8
Lead	67.4	85.1
Mercury	0.104	0.114
Nickel	25.1	27.2
Silver	0.969	1.05
Vanadium	54.7	55.7
Zinc	247	154

Sample Name	SB-351
Sample Date	2/18/2022
Sample Depth (ft bg)	1-1.5
VOCs (mg/kg)	
Methylene Chloride	0.04
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.321
Metals (mg/kg)	
Antimony	7.62
Arsenic	23
Barium	289
Cadmium	1.5
Chromium	54.3
Copper	75.4
Lead	111
Mercury	0.146
Nickel	18
Silver	1.11
Vanadium	52.8
Zinc	515

Sample Name	SB-350
Sample Date	2/18/2022
Sample Depth (ft bg)	0.25-0.75
Metals (mg/kg)	
Antimony	6.71
Arsenic	2.52
Barium	199
Cadmium	1.04
Chromium	74
Copper	143
Lead	171
Mercury	0.188
Nickel	31.9
Silver	0.811
Vanadium	42.9
Zinc	187

Sample Name	SB-353
Sample Date	2/18/2022
Sample Depth (ft bg)	0-0.5
VOCs (mg/kg)	
Methylene Chloride	0.01
SVOCs (mg/kg)	
Benzo(b)fluoranthene	0.587
Fluoranthene	0.975
Pyrene	0.695
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.0254
Metals (mg/kg)	
Antimony	5.47
Barium	115
Chromium	32.4
Copper	31.9
Lead	37.5
Mercury	0.108
Nickel	8.44
Silver	1.43
Vanadium	38.3
Zinc	90.2

Sample Name	SB-354
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1
VOCs (mg/kg)	
Methylene Chloride	0.039
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.046
Metals (mg/kg)	
Antimony	7.59
Arsenic	4.24
Barium	151
Cadmium	0.484
Chromium	55.8
Copper	46.2
Lead	95.5
Mercury	0.222
Nickel	15.6
Silver	1.31
Vanadium	53
Zinc	175

Sample Name	SB-334
Sample Date	2/18/2022
Sample Depth (ft bg)	0.75-1.25
VOCs (mg/kg)	
Methylene Chloride	0.063
SVOCs (mg/kg)	
Benzo(a)anthracene	**1.38**
Benzo(a)pyrene	**1.06**
Benzo(b)fluoranthene	**1.91**
Benzo(g,h,i)Perylene	0.658
Benzo(k)fluoranthene	0.999
Chrysene	1.15
Fluoranthene	2.47
Indeno(1,2,3-cd)pyrene	0.831
Phenanthrene	1.59
Pyrene	2.09
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.0754
PCBs (mg/kg)	
Total PCBs	0.0309
Metals (mg/kg)	
Antimony	11.4
Barium	322
Cadmium	1.71
Chromium	110
Copper	204
Lead	389
Mercury	0.157
Nickel	60
Vanadium	65.1
Zinc	253

Sample Name	SB-355
Sample Date	3/11/2022
Sample Depth (ft bg)	0.75-1.25
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	ND

Sample Name	SB-335
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1
VOCs (mg/kg)	
Acetone	0.033
Methylene Chloride	0.03
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.0731
Metals (mg/kg)	
Antimony	8.59
Arsenic	3.31
Barium	171
Cadmium	0.788
Chromium	79
Copper	67.8
Lead	187
Mercury	0.186
Nickel	25.9
Silver	2.35
Vanadium	63.2
Zinc	131

Sample Name	SB-356
Sample Date	3/11/2022
Sample Depth (ft bg)	0-1
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Antimony	10.8
Arsenic	3.37
Barium	158
Chromium	89.8
Copper	25.2
Lead	72.1
Mercury	0.0943
Nickel	48.6
Silver	0.897
Vanadium	64.7
Zinc	109

Sample Name	SB-330
Sample Date	2/18/2022
Sample Depth (ft bg)	0-1
SVOCs (mg/kg)	
Benzo(a)anthracene	0.711
Benzo(a)pyrene	0.899
Benzo(b)fluoranthene	0.797
Fluoranthene	1.1
Pyrene	0.842
Pesticides/Herbicides (mg/kg)	
4,4'-DDE	0.0134
Chlordane (alpha and gamma)	**0.135**
Dieldrin	0.182
ETPH (mg/kg)	
ETPH	71.2
PCBs (mg/kg)	
Total PCBs	1.05
Metals (mg/kg)	
Antimony	17.3
Arsenic	8.84
Barium	1430
Cadmium	17.5
Chromium	234
Copper	1500
Lead	2060
Mercury	1.18
Nickel	204
Silver	3.08
Vanadium	180
Zinc	2410

Sample Name	SB-357
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Antimony	10.3
Arsenic	2.88
Barium	150
Chromium	81.7
Copper	27.8
Lead	56.5
Mercury	0.139
Nickel	51.6
Silver	0.991
Vanadium	69.6
Zinc	203

Sample Name	SB-337
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1
VOCs (mg/kg)	
Methylene Chloride	0.04
Pesticides/Herbicides (mg/kg)	
4,4'-DDD	0.0108
4,4'-DDT	0.0619
Dieldrin	0.164
ETPH (mg/kg)	
ETPH	102
PCBs (mg/kg)	
Total PCBs	0.212
Metals (mg/kg)	
Antimony	21.8
Arsenic	12.5
Barium	1040
Cadmium	10.4
Chromium	217
Copper	1740
Lead	2320
Mercury	0.572
Nickel	156
Silver	1.02
Vanadium	81
Zinc	2080

Sample Name	SB-338
Sample Date	2/18/2022
Sample Depth (ft bg)	1.25-1.75
VOCs (mg/kg)	
Methylene Chloride	0.021
Metals (mg/kg)	
Antimony	9
Arsenic	1.88
Barium	99.7
Chromium	66.8
Copper	23.5
Lead	9.93
Mercury	0.0393
Nickel	39.2
Silver	1.8
Vanadium	57.7
Zinc	47.7

Sample Name	SB-339
Sample Date	2/18/2022
Sample Depth (ft bg)	0.25-0.75
VOCs (mg/kg)	
Methylene Chloride	0.1
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.0927
Metals (mg/kg)	
Antimony	8.36
Arsenic	4.35
Barium	120
Chromium	54.4
Copper	47.4
Lead	196
Mercury	0.159
Nickel	22.1
Silver	1.51
Vanadium	51.5
Zinc	134

Sample Name	SB-347
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.25
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.0563
ETPH (mg/kg)	
ETPH	117
Metals (mg/kg)	
Arsenic	5.21
Barium	101
Cadmium	0.481
Chromium	18.6
Copper	457
Lead	100
Mercury	0.364
Nickel	13.9
Silver	3.79
Vanadium	39.5
Zinc	123

Sample Name	SB-346
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.5
VOCs (mg/kg)	
Methylene Chloride	0.013
Pesticides/Herbicides (mg/kg)	
4,4'-DDD	0.0439
4,4'-DDT	0.0578
Dieldrin	**0.015**
Oxadiazon	0.0431
ETPH (mg/kg)	
ETPH	103
PCBs (mg/kg)	
Total PCBs	1.64
Metals (mg/kg)	
Antimony	13.2
Arsenic	14
Barium	653
Cadmium	11.6
Chromium	328
Copper	4950
Lead	724
Mercury	0.375
Nickel	153
Silver	3.02
Vanadium	58.1
Zinc	679

Sample Name	SB-360
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1.25
SVOCs (mg/kg)	
Benzo(a)anthracene	0.677
Chrysene	0.654
Fluoranthene	1.69
Phenanthrene	1.1
Pyrene	1.7
PCBs (mg/kg)	
Total PCBs	0.47
Metals (mg/kg)	
Antimony	4.81
Arsenic	9.01
Barium	192
Cadmium	2.46
Chromium	63.5
Copper	112
Lead	223
Mercury	0.27
Nickel	44.1
Silver	0.691
Vanadium	45.1
Zinc	328

Sample Name	SB-341
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.5
VOCs (mg/kg)	
Methylene Chloride	0.02
Trichloroethylene	0.01
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.123
Metals (mg/kg)	
Antimony	9.85
Arsenic	2.41
Barium	611
Cadmium	1.99
Chromium	120
Copper	136
Lead	256
Mercury	0.217
Nickel	37.7
Silver	0.953
Vanadium	61.8
Zinc	308

Sample Name	SB-342
Sample Date	2/18/2022
Sample Depth (ft bg)	1-2
VOCs (mg/kg)	
Acetone	0.046
Methylene Chloride	0.05
Pesticides/Herbicides (mg/kg)	
Dieldrin	0.143
PCBs (mg/kg)	
Total PCBs	0.657
Metals (mg/kg)	
Antimony	18.5
Arsenic	3.48
Barium	1260
Cadmium	2.85
Chromium	426
Copper	202
Lead	1570
Mercury	0.269
Nickel	44.2
Vanadium	67.6
Zinc	903

Sample Name	SB-340	DUP-2
Sample Date	2/18/2022	
Sample Depth (ft bg)	1-1.5	
VOCs (mg/kg)		
Methylene Chloride	0.077	0.016
Pesticides/Herbicides (mg/kg)		
Dieldrin	0.171	0.203
ETPH (mg/kg)		
ETPH	ND	65.4
PCBs (mg/kg)		
Total PCBs	0.0513	ND
Metals (mg/kg)		
Antimony	9.91	10.2
Arsenic	6.34	3.16
Barium	247	223
Cadmium	1.51	1.12
Chromium	111	106
Copper	186	85.1
Lead	269	196
Mercury	0.915	0.29
Nickel	52.4	46.1
Silver	1.58	1.67
Vanadium	68.8	69.6
Zinc	291	216

Sample Name	SB-345
Sample Date	2/18/2022
Sample Depth (ft bg)	1-2
VOCs (mg/kg)	
Methylene Chloride	0.045
Pesticides/Herbicides (mg/kg)	
4,4'-DDE	0.00646
Dieldrin	0.111
ETPH (mg/kg)	
ETPH	97.5
PCBs (mg/kg)	
Total PCBs	0.606
Metals (mg/kg)	
Antimony	11.1
Arsenic	12.2
Barium	389
Cadmium	3.96
Chromium	147
Copper	194
Lead	297
Mercury	0.261
Nickel	77.4
Silver	1.12
Vanadium	62.9
Zinc	373

Sample Name	SB-358
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1.25
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	0.108
Metals (mg/kg)	
Antimony	7.3
Arsenic	4.18
Barium	180
Cadmium	0.532
Chromium	67.9
Copper	49.6
Lead	85.6
Mercury	0.0713
Nickel	44.4
Vanadium	50.3
Zinc	197

Sample Name	SB-359
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1.5
SVOCs (mg/kg)	
Chrysene	0.608
Fluoranthene	1.21
Pyrene	1.22
PCBs (mg/kg)	
Total PCBs	0.389
Metals (mg/kg)	
Antimony	6.38
Arsenic	2.11
Barium	228
Cadmium	1.13
Chromium	42.2
Copper	180
Lead	299
Mercury	0.175
Nickel	41.5
Silver	0.732
Vanadium	31.6
Zinc	333

Sample Name	SB-344A	SB-344B
Sample Date	2/18/2022	2/18/2022
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Methylene Chloride	0.048	0.044
Pesticides/Herbicides (mg/kg)		
4,4'-DDE	ND	0.0387
4,4'-DDT	0.00501	0.00405
Dieldrin	**0.0181**	**0.0164**
Heptachlor	ND	**0.0387**
Oxadiazon	6.15	0.135
ETPH (mg/kg)		
ETPH	51.9	ND
PCBs (mg/kg)		
Total PCBs	3.36	4.16
Metals (mg/kg)		
Antimony	7.84	12
Arsenic	4.41	6.76
Barium	154	310
Cadmium	2.17	4.19
Chromium	108	174
Copper	133	271
Lead	202	431
Mercury	0.222	67.4
Nickel	31.4	67.4
Silver	1.21	1.91
Vanadium	49.9	78
Zinc	246	396

Sample Name	SB-343	DUP-1
Sample Date	2/18/2022	
Sample Depth (ft bg)	0-1	
VOCs (mg/kg)		
Acetone	0.017	0.02
Methylene Chloride	0.033	0.015
Pesticides/Herbicides (mg/kg)		
Heptachlor epoxide	**0.078**	ND
Oxadiazon	0.0936	0.154
PCBs (mg/kg)		
Total PCBs	0.866	0.766
Metals (mg/kg)		
Antimony	9.29	10.2
Arsenic	3.06	4.22
Barium	204	250
Cadmium	1.99	1.98
Chromium	93.7	90.5
Copper	98.1	89.2
Lead	214	199
Mercury	0.165	0.218
Nickel	34.9	81.2
Silver	1.76	2.45
Vanadium	65.8	74.8
Zinc	275	236

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1–FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1–FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH)
- AUGUST 2021 SOIL BORING LOCATIONS
- MARCH 2022 SOIL BORING LOCATIONS
- MARCH 2022 MONITORING WELL LOCATIONS
- MARCH 2022 SOIL VAPOR LOCATIONS
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- WESTERN MIDDLE SCHOOL PROPERTY LINE
- FENCE LINE
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
2. MG/KG = MILLIGRAMS PER KILOGRAM
3. ND = NON-DETECT
4. NT = NOT TESTED
5. NS = NO STANDARD
6. PCB = POLYCHLORINATED BIPHENYLS
7. VOCs = VOLATILE ORGANIC COMPOUNDS
8. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
9. ETPH = EXTRACTABLE PETROLEUM HYDROCARBONS
10. CTDEEP = CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
11. RSRs = REMEDIATION STANDARD REGULATIONS
12. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA
13. I/C DEC = INDUSTRIAL/COMMERCIAL DIRECT EXPOSURE CRITERIA
14. GB PMC = GB POLLUTANT MOBILITY CRITERIA
15. * = FOR THOSE COMPOUNDS THAT DO NOT HAVE CERTAIN CRITERIA ESTABLISHED WITHIN THE CTDEEP RSRS, EFFECTIVE 30 JANUARY 1996 AND 27 JUNE 2013, ADDITIONAL POLLUTING SUBSTANCE CRITERIA MUST BE REQUESTED FOR APPROVAL BY THE CTDEEP. THE DATA WAS COMPARED TO THE CRITERIA LISTED IN THE 10 DECEMBER 2015 (REVISED 12 OCTOBER 2018) TECHNICAL SUPPORT DOCUMENT: RECOMMENDED NUMERIC CRITERIA FOR COMMON ADDITIONAL POLLUTING SUBSTANCES AND CERTAIN ALTERNATIVE CRITERIA.

Analyte	RDEC	I/C DEC	GB PMC
VOCs (mg/kg)			
Acetone	500	1,000	140
Methylene Chloride	92	760	1
Trichloroethene (TCE)	56	520	1
SVOCs (mg/kg)			
Benzo(a)anthracene	1	7.8	1
Benzo(a)pyrene	1	1	1
Benzo(b)fluoranthene	1	7.8	1
Benzo(g,h,i)Perylene	8.4	78	1
Benzo(k)fluoranthene	8.4	78	1
Chrysene	84	780	1
Fluoranthene	1,000	2,500	56
Indeno(1,2,3-cd)pyrene	1	7.8	1
Phenanthrene	1,000	2,500	40
Pyrene	1,000	2,500	40
Pesticides/Herbicides (mg/kg)			
4,4'-DDD	1.8	17	0.02
4,4'-DDE	1.8	17	0.02
4,4'-DDT	1.8	17	0.02
Chlordane (alpha and gamma)	0.49	2.2	0.068
Dieldrin	0.038	0.36	0.007
Heptachlor	0.14	1.3	0.013
Heptachlor epoxide	0.067	0.63	0.02
Oxadiazon	-	-	-
ETPH (mg/kg)			
ETPH	500	2,500	2,500
PCBs (mg/kg)			
Total PCBs	1	10	NS
Metals (mg/kg)			
Antimony	27	8,200	NS
Arsenic	10	10	NS
Barium	4,700	140,000	NS
Cadmium	34	1,000	NS
Chromium	4,000	51,100	NS
Copper	2,500	76,000	NS
Lead	400	1,000	NS
Mercury	20	610	NS
Nickel	1,400	7,500	NS
Silver	340	10,000	NS
Vanadium	470	14,000	NS
Zinc	20,000	610,000	NS

Exceedance Summary:

Result exceeds CTDEEP RSRs Residential Direct Exposure Criteria (RDEC)

Result exceeds CTDEEP RSRs Industrial/Commercial Direct Exposure Criteria (I/CDEC)

Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria (PMC)

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: MARCH 2022 SOIL ANALYTICAL SUMMARY PLAN

Project No. 140148201
Date MARCH 2022
Drawn By JPH
Checked By RJW

Drawing No. 3N
Sheet 3N of 11

PROJECT NO. 140148201

Filename: \langan.com\data\NH\data2\140148201\Cadd\Data - 140148201\2D-Design\Files\140148201-Western Middle School_2022.03_Soil Tag_REV.dwg Date: 4/3/2022 Time: 23:27 User: jhall Style Table: Langan.stb Layout: 2022 - Soil Investigation

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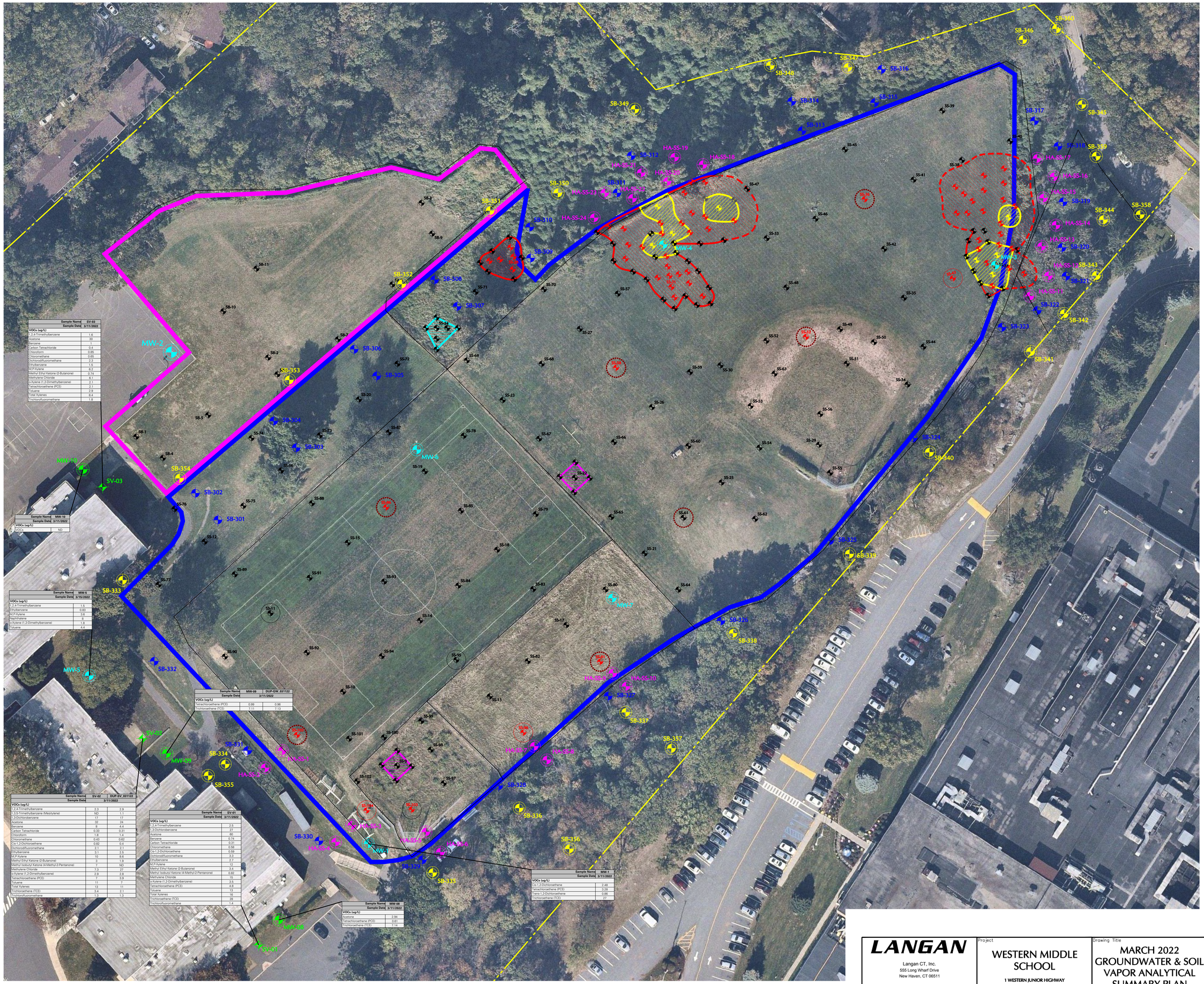

Sample Name	MW-10
Sample Date	3/11/2022
VOCs (ug/L)	
VOCs	ND

Sample Name	MW-5
Sample Date	3/15/2022
VOCs (ug/L)	
1,2,4-Trimethylbenzene	1.5
Ethylbenzene	0.83
M,P-Xylene	3.6
Naphthalene	8
o-Xylene (1,2-Dimethylbenzene)	1.8
Toluene	4.4

Sample Name	MW-09	DUP-GW_031122
Sample Date	3/11/2022	
VOCs (ug/L)		
Tetrachloroethene (PCE)	0.99	0.96
Trichloroethene (TCE)	7.11	7.13

Sample Name	SV-03
Sample Date	3/11/2022
VOCs (ug/L)	
1,2,4-Trimethylbenzene	1.6
Acetone	30
Benzene	1
Carbon Tetrachloride	0.4
Chloroform	0.85
Chloromethane	0.65
Dichlorodifluoromethane	2.3
Ethylbenzene	1.5
M,P-Xylene	6.2
Methyl Ethyl Ketone (2-Butanone)	0.74
Methylene Chloride	6.1
o-Xylene (1,2-Dimethylbenzene)	2.1
Tetrachloroethene (PCE)	2.1
Toluene	2.9
Total Xylenes	8.4
Trichlorofluoromethane	1.8

Sample Name	SV-02	DUP-SV_031122
Sample Date	3/11/2022	
VOCs (ug/L)		
1,2,4-Trimethylbenzene	2.3	2.9
1,3,5-Trimethylbenzene (Mesitylene)	ND	1.1
1,3-Dichlorobenzene	17	17
Acetone	32	24
Benzene	8	4.4
Carbon Tetrachloride	0.33	0.31
Chloroform	1.8	1.4
Chloromethane	0.43	0.62
Cis-1,2-Dichloroethene	0.82	0.4
Dichlorodifluoromethane	2.1	2.1
Ethylbenzene	3.1	2.5
M,P-Xylene	10	8.6
Methyl Ethyl Ketone (2-Butanone)	3	1.9
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	7	ND
Methylene Chloride	7.3	27
o-Xylene (1,2-Dimethylbenzene)	2.9	2.8
Tetrachloroethene (PCE)	7	3.9
Toluene	11	7
Total Xylenes	13	11
Trichloroethene (TCE)	3.4	2.1
Trichlorofluoromethane	1.3	1.3

Sample Name	SV-01
Sample Date	3/11/2022
VOCs (ug/L)	
1,2,4-Trimethylbenzene	2.5
1,3-Dichlorobenzene	27
Acetone	60
Benzene	0.74
Carbon Tetrachloride	0.31
Chloromethane	0.58
Cis-1,2-Dichloroethene	0.59
Dichlorodifluoromethane	3.3
Ethylbenzene	2.7
M,P-Xylene	12
Methyl Ethyl Ketone (2-Butanone)	3.4
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.82
Methylene Chloride	15
o-Xylene (1,2-Dimethylbenzene)	3.5
Tetrachloroethene (PCE)	4.8
Toluene	13
Total Xylenes	16
Trichloroethene (TCE)	28
Trichlorofluoromethane	1.4

Sample Name	MW-08
Sample Date	3/11/2022
VOCs (ug/L)	
Acetone	2.94
Tetrachloroethene (PCE)	0.61
Trichloroethene (TCE)	7.14

Sample Name	MW-1
Sample Date	3/11/2022
VOCs (ug/L)	
Cis-1,2-Dichloroethene	2.48
Tetrachloroethene (PCE)	3.28
Trans-1,2-Dichloroethene	0.86
Trichloroethene (TCE)	27

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1-FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1-FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH)
- AUGUST 2021 SOIL BORING LOCATIONS
- MARCH 2022 SOIL BORING LOCATIONS
- MARCH 2022 MONITORING WELL LOCATIONS
- MARCH 2022 SOIL VAPOR LOCATIONS
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- WESTERN MIDDLE SCHOOL PROPERTY LINE
- FENCE LINE
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
2. MG/KG = MILLIGRAMS PER KILOGRAM
3. MG/L = MILLIGRAMS PER LITER
4. UG/L = MICROGRAMS PER LITER
5. UG/M3 = MICROGRAMS PER CUBIC METER
6. ND = NON-DETECT
7. NT = NOT TESTED
8. NS = NO STANDARD
9. PCB = POLYCHLORINATED BIPHENYLS
10. VOCs = VOLATILE ORGANIC COMPOUNDS
11. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
12. ETPH = EXTRACTABLE PETROLEUM HYDROCARBONS
13. CTDEEP = CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
14. RSRs = REMEDIATION STANDARD REGULATIONS
15. RVC = RESIDENTIAL VOLATILIZATION CRITERIA (GROUNDWATER)
16. SWPC = SURFACE WATER PROTECTION CRITERIA
17. RSVVC = RESIDENTIAL SOIL VAPOR VOLATILIZATION CRITERIA
18. * = FOR THOSE COMPOUNDS THAT DO NOT HAVE CERTAIN CRITERIA ESTABLISHED WITHIN THE CTDEEP RSRS, EFFECTIVE 30 JANUARY 1996 AND 27 JUNE 2013, ADDITIONAL POLLUTING SUBSTANCE CRITERIA MUST BE REQUESTED FOR APPROVAL BY THE CTDEEP. THE DATA WAS COMPARED TO THE CRITERIA LISTED IN THE 10 DECEMBER 2015 (REVISED 12 OCTOBER 2018) TECHNICAL SUPPORT DOCUMENT; RECOMMENDED NUMERIC CRITERIA FOR COMMON ADDITIONAL POLLUTING SUBSTANCES AND CERTAIN ALTERNATIVE CRITERIA.

Groundwater Criteria		
Analyte	RVC	SWPC
VOCs (ug/L)		
1,2,4-Trimethylbenzene	940*	190*
1,2-Dibromoethane (Ethylene Dibromide)	0.3	NS
Acetone	50000	10000*
Cis-1,2-Dichloroethene	NS	6200*
Ethylbenzene	50000	580000
M,P-Xylene	NS	NS
Naphthalene	NS	210*
o-Xylene (1,2-Dimethylbenzene)	NS	NS
Tetrachloroethene (PCE)	340	88
Toluene	22500	4000000
Trans-1,2-Dichloroethene	NS	10000*
Trichloroethene (TCE)	27	2340
Exceedance Summary:		
Result exceeds CTDEEP RSRs Residential Volatilization Criteria (RVC)		
Result exceeds CTDEEP RSRs - Surface Water Protection Criteria (SWPC)		

Soil Vapor Criteria	
Analyte	RSVVC
VOCs (ug/L)	
1,2,4-Trimethylbenzene	20000*
1,3,5-Trimethylbenzene (Mesitylene)	20000*
1,3-Dichlorobenzene	55000
Acetone	140000
Benzene	2500
Carbon Tetrachloride	380
Chloroform	380
Chloromethane	3600*
Cis-1,2-Dichloroethene	NS
Dichlorodifluoromethane	39000*
Ethylbenzene	40000
M,P-Xylene	NS
Methyl Ethyl Ketone (2-Butanone)	370000
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	28000
Methylene Chloride	2300
o-Xylene (1,2-Dimethylbenzene)	NS
Tetrachloroethene (PCE)	3800
Toluene	160000
Total Xylenes	170000
Trichloroethene (TCE)	780
Trichlorofluoromethane	280000*
Exceedance Summary:	
Result exceeds CTDEEP RSRs Residential Soil Vapor Volatilization Criteria (RSVVC)	

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

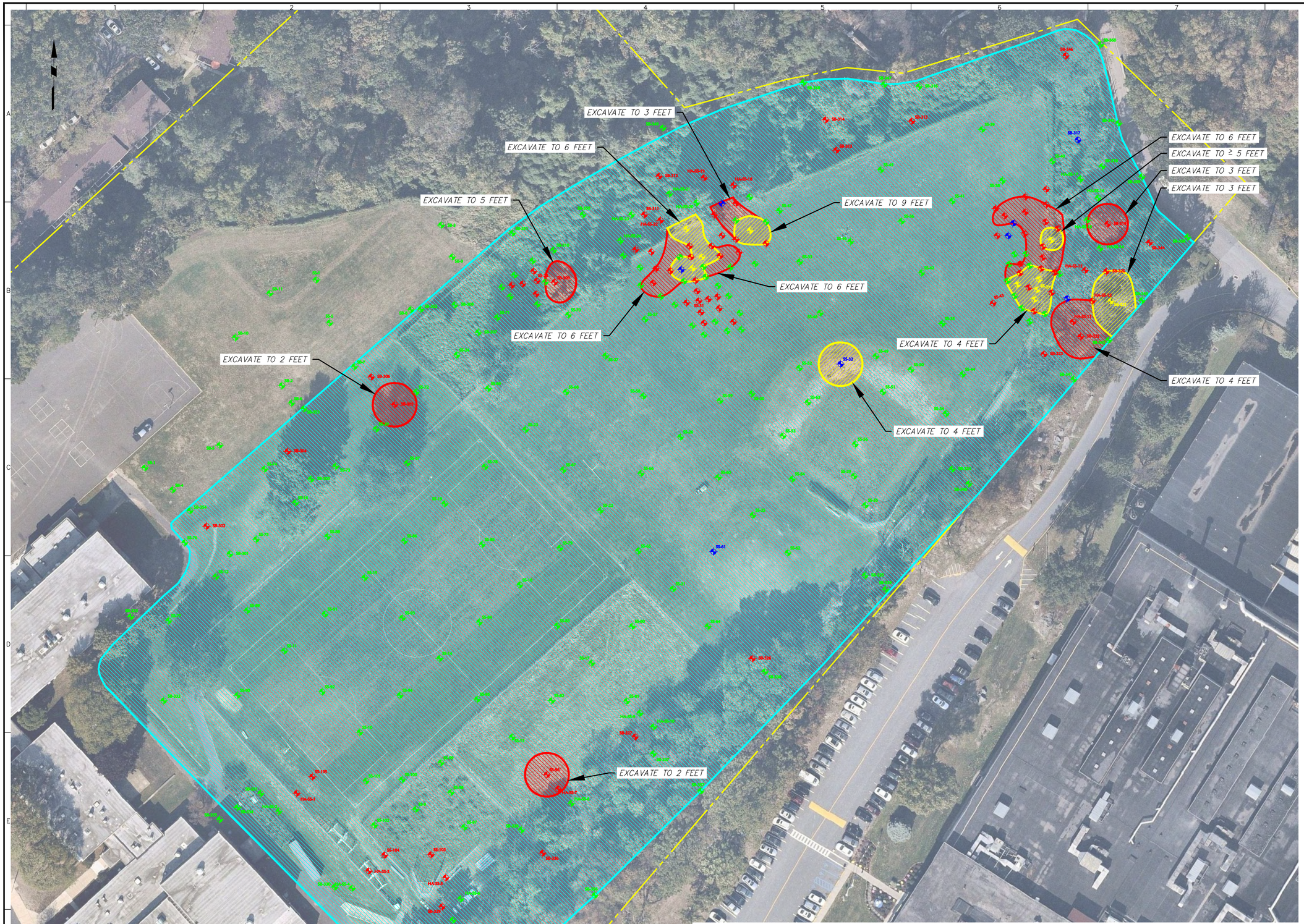
Drawing Title: MARCH 2022 GROUNDWATER & SOIL VAPOR ANALYTICAL SUMMARY PLAN

Project No. 140148201
Date MARCH 2022
Drawn By JPH
Checked By RJW

Drawing No. 3O
Sheet 3O of 11

PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data01\140148201\CadD Data - 140148201\2D-Design\Files\140148201-Western Middle School_2022-03_Soil Tag_REV.dwg Date: 4/3/2022 Time: 23:28 User: jhall Style Table: Langan.stb Layout: 2022 - GW & SV Investigation



LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- APPROXIMATE AREA TO BE EXCAVATED TO 4 FEET
- ESTIMATED EXCAVATION AREA OF PCBs > 50 MG/KG (EXCAVATION DEPTHS RANGE FROM 3 TO 9 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- ESTIMATED EXCAVATION AREA OF PCBs > 10 MG/KG (EXCAVATION DEPTHS RANGE FROM 2 TO 6 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)

NOTES

1. REMEDIAL ALTERNATIVE NO. 1 FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 4 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 4 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON-WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021, AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
3. PCB = POLYCHLORINATED BIPHENYLS
4. VOC = VOLATILE ORGANIC COMPOUNDS
5. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
6. MG/KG = MILLIGRAMS PER KILOGRAM
7. BGS = BELOW GROUND SURFACE
8. CY = CUBIC YARDS
9. LBS = POUNDS
10. SF = SQUARE FEET
11. PPM = PARTS PER MILLION
12. EC = ENGINEERED CONTROL

Summary of Estimated Quantities - Remedial Alternative 1 -		
Excavation Volume (CY)	PCBs < 50 mg/kg	64,287
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) [1.7 tons per CY]		111,360
# of Days Required for Excavation		189
# of Days Required for Backfill		63
Total # of Days Required for Construction		252
Approximate Cost		±$28.3 MIL

Remedial Summary	Remedial Excavation			Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
	Area (sf)	Volume (cy)	Weight (tons)		
Sitewide Excavation of 4 feet	420,169	62,555	106,344	65,506	111,360
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
Excavations with PCBs > 10 PPM	11,075	1,731	2,943		

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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

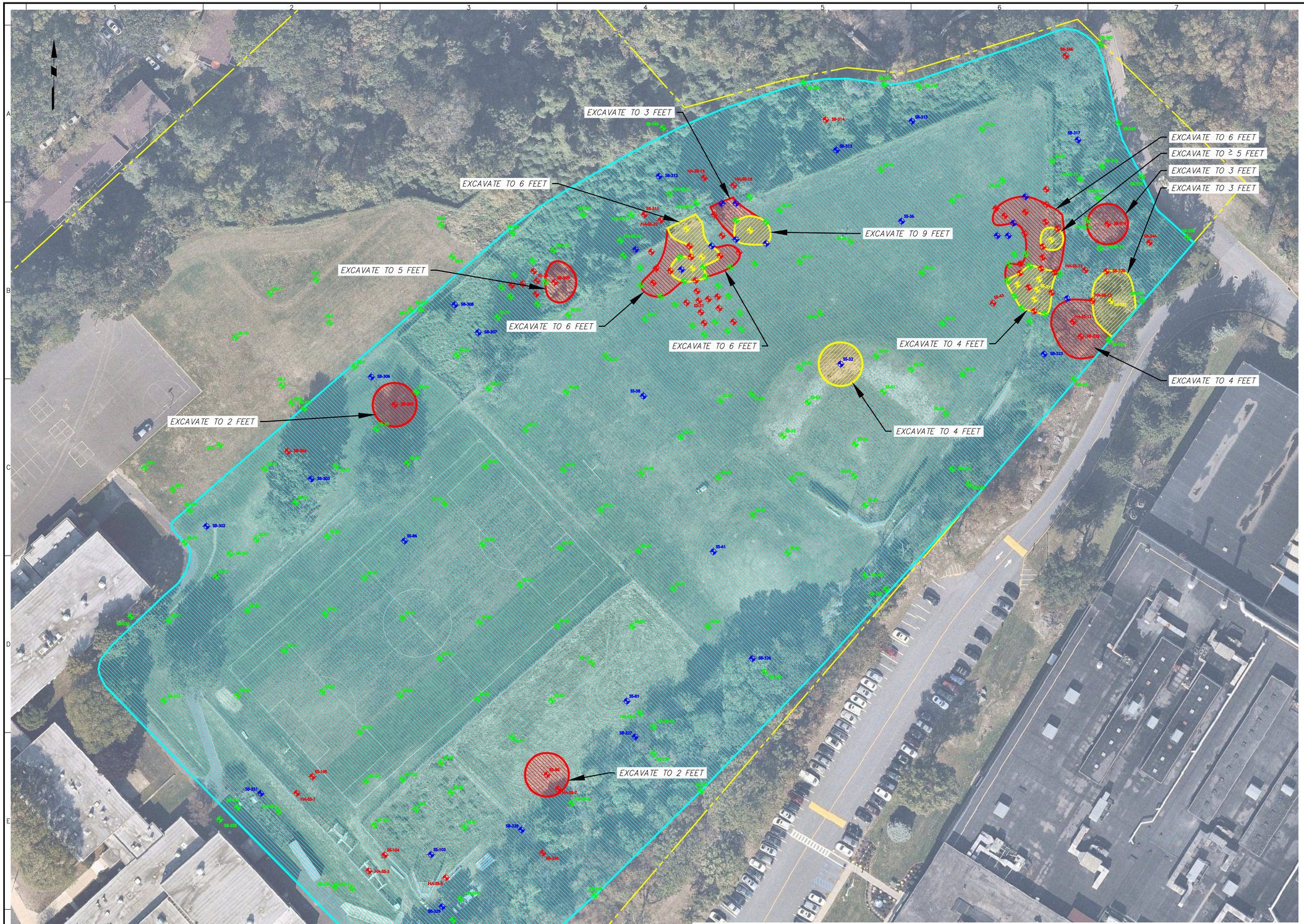
Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
AOC-1 REMEDIAL ALTERNATIVE NO. 1 EXCAVATION PLAN

Project No. 140148201	Drawing No. 4
Date JUNE 2022	
Scale 1" = 40'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 4 of 11

LANGAN
SUBMISSION DATE: JUNE 2022
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:52 User: jhall Style Table: Langan.stb Layout: Fig 4 - RA-1 (4ft)



LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- APPROXIMATE AREA TO BE EXCAVATED TO 2 FEET
- ESTIMATED EXCAVATION AREA OF PCBs > 50 MG/KG (EXCAVATION DEPTHS RANGE FROM 3 TO 9 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- ESTIMATED EXCAVATION AREA OF PCBs > 10 MG/KG (EXCAVATION DEPTHS RANGE FROM 2 TO 6 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)

NOTES

1. REMEDIAL ALTERNATIVE NO. 2 FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON-WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021, AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
3. PCB = POLYCHLORINATED BIPHENYLS
4. VOC = VOLATILE ORGANIC COMPOUNDS
5. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
6. MG/KG = MILLIGRAMS PER KILOGRAM
7. BGS = BELOW GROUND SURFACE
8. CY = CUBIC YARDS
9. LBS = POUNDS
10. SF = SQUARE FEET
11. PPM = PARTS PER MILLION
12. EC = ENGINEERED CONTROL

Summary of Estimated Quantities - Remedial Alternative 2 -		
Excavation Volume (CY)	PCBs < 50 mg/kg	32,855
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) [1.7 tons per CY]		57,926
# of Days Required for Excavation		108
# of Days Required for Backfill		36
Total # of Days Required for Construction		144
Approximate Cost		±$19.2 MIL

Remedial Summary	Remedial Excavation			Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
	Area (sf)	Volume (cy)	Weight (tons)		
Sitewide Excavation of 2 feet	420,169	31,124	52,910	34,074	57,926
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
Excavations with PCBs > 10 PPM	11,075	1,731	2,943		

40 0 10 25 40
SCALE IN FEET

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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title: AOC-1 REMEDIAL ALTERNATIVE NO. 2 EXCAVATION PLAN

Project No. 140148201
Date JUNE 2022
Scale 1" = 40'
Drawn By JPH
Checked By RJW
Submission Date JUNE 2022
Drawing No. 5
Sheet 5 of 11

LANGAN
PROJECT NO. 140148201 SUBMISSION DATE: JUNE 2022

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:53 User: jhall Style Table: Langan.stb Layout: Fig 5 - RA-2 (2ft)

EXCAVATE TO 3 FEET

EXCAVATE TO 6 FEET

EXCAVATE TO 5 FEET

EXCAVATE TO 9 FEET

EXCAVATE TO 6 FEET

EXCAVATE TO 6 FEET

EXCAVATE TO 2 FEET

EXCAVATE TO 6 FEET

EXCAVATE TO ≥ 5 FEET

EXCAVATE TO 3 FEET

EXCAVATE TO 3 FEET

EXCAVATE TO 4 FEET

EXCAVATE TO 4 FEET

EXCAVATE TO 2 FEET

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- APPROXIMATE AREA TO BE EXCAVATED TO 1 FEET
- ESTIMATED EXCAVATION AREA OF PCBs > 50 MG/KG (EXCAVATION DEPTHS RANGE FROM 3 TO 9 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- ESTIMATED EXCAVATION AREA OF PCBs > 10 MG/KG (EXCAVATION DEPTHS RANGE FROM 2 TO 6 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)

NOTES

1. REMEDIAL ALTERNATIVE NO. 3 FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 1 FOOT, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 1 FOOT BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON-WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021, AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
3. PCB = POLYCHLORINATED BIPHENYLS
4. VOC = VOLATILE ORGANIC COMPOUNDS
5. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
6. MG/KG = MILLIGRAMS PER KILOGRAM
7. BGS = BELOW GROUND SURFACE
8. CY = CUBIC YARDS
9. LBS = POUNDS
10. SF = SQUARE FEET
11. PPM = PARTS PER MILLION
12. EC = ENGINEERED CONTROL

Summary of Estimated Quantities - Remedial Alternative 3 -		
Excavation Volume (CY)	PCBs < 50 mg/kg	17,294
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) [1.7 tons per CY]		31,472
# of Days Required for Excavation		68
# of Days Required for Backfill		23
Total # of Days Required for Construction		90
Approximate Cost		±$14.6 MIL

Remedial Summary	Remedial Excavation			Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
	Area (sf)	Volume (cy)	Weight (tons)		
Sitewide Excavation of 1 foot	420,169	15,562	26,455	18,512	31,471
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
Excavations with PCBs > 10 PPM	11,075	1,731	2,943		

SCALE IN FEET

LANGAN
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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

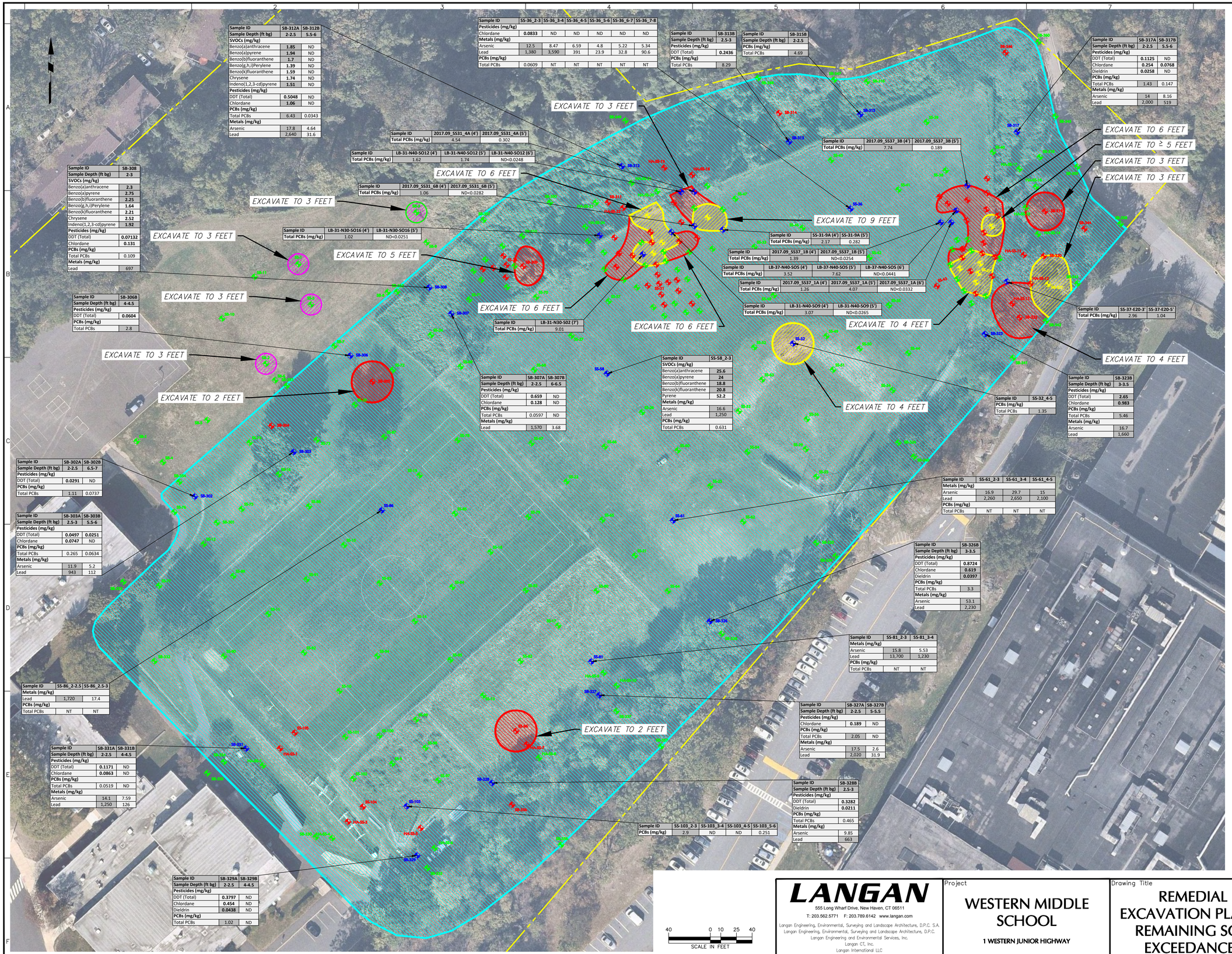
Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title: AOC-1 REMEDIAL ALTERNATIVE NO. 3 EXCAVATION PLAN

Project No. 140148201
Date JUNE 2022
Scale 1" = 40'
Drawn By JPH
Checked By RJW
Submission Date JUNE 2022
Drawing No. 6
Sheet 6 of 11

LANGAN
PROJECT NO. 140148201 SUBMISSION DATE: JUNE 2022

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:54 User: jhall Style Table: Langan.stb Layout: Fig 6 - RA-3 (1ft)



LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- APPROXIMATE AREA TO BE EXCAVATED TO 2 FEET
- ESTIMATED EXCAVATION AREA OF PCBs > 50 MG/KG (EXCAVATION DEPTHS RANGE FROM 3 TO 9 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- ESTIMATED EXCAVATION AREA OF PCBs > 10 MG/KG (EXCAVATION DEPTHS RANGE FROM 2 TO 6 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- AOC–2 ARSENIC IMPACTED SOIL REMEDIAL EXCAVATION AREAS (AREAS TO BE EXCAVATED TO APPROXIMATELY 3 FEET BGS)
- AOC–2 ARSENIC AND PESTICIDE IMPACTED SOIL REMEDIAL EXCAVATION AREA (AREA TO BE EXCAVATED TO APPROXIMATELY 3 FEET BGS)

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON–WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. THE PROPOSED REMEDIAL APPROACH FOR AOC–2 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF ARSENIC AND PESTICIDE IMPACTED SOIL BENEATH THE RECREATIONAL AREA TO A DEPTH OF 3 FEET.
3. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
4. PCB = POLYCHLORINATED BIPHENYLS
5. VOC = VOLATILE ORGANIC COMPOUNDS
6. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
7. MG/KG = MILLIGRAMS PER KILOGRAM
8. BGS = BELOW GROUND SURFACE
9. CY = CUBIC YARDS
10. LBS = POUNDS
11. SF = SQUARE FEET
12. PPM = PARTS PER MILLION
13. EC = ENGINEERED CONTROL

Summary of Estimated Quantities - Remedial Alternative 2 -

Excavation Volume (CY)	PCBs < 50 mg/kg	32,855
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) (1.7 tons per CY)		57,926
# of Days Required for Excavation		108
# of Days Required for Backfill		36
Total # of Days Required for Construction		144
Approximate Cost		±$19.2 MIL

Remedial Summary	Remedial Excavation Area (sf)	Remedial Excavation Volume (cy)	Remedial Excavation Weight (tons)	Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
Sitewide Excavation of 2 feet	420,169	31,124	52,910	34,074	57,926
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
Excavations with PCBs > 10 PPM	11,075	1,731	2,943		

Compounds to Remain in Place Under Engineered Controls

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	Concentrations Above Criteria to Remain in Place
SVOCs	mg/kg	mg/kg	mg/kg
Benzo(a)anthracene	1	1	1.85 to 25.6
Benzo(a)pyrene	1	1	1.94 to 24
Benzo(b)fluoranthene	1	1	1.7 to 18.8
Benzo(g,h,i)Perylene	8.4	1	1.39 to 1.64
Benzo(k)fluoranthene	8.4	1	1.59 to 20.8
Chrysene	84	1	1.74 to 2.52
Indeno(1,2,3-cd)pyrene	1	1	1.51 to 1.92
Pyrene	1,000	40	52.2
Pesticides	mg/kg	mg/kg	mg/kg
Chlordane	0.49	0.066	0.0747 to 1.06
Dieldrin	0.038	0.007	0.0211 to 0.0438
DDT (Total)	1.8	0.02	0.0251 to 2.65
Metals	mg/kg	mg/L	mg/L
Arsenic	10	~	11.9 to 53.1
Lead	400	~	519 to 13,700
PCBs	mg/kg	mg/L	mg/L
Total PCBs	1	~	1.02 to 9.01

Bold indicates an exceedance of the Pollutant Mobility Criteria

Shaded indicates an exceedance of the Residential Direct Exposure Criteria

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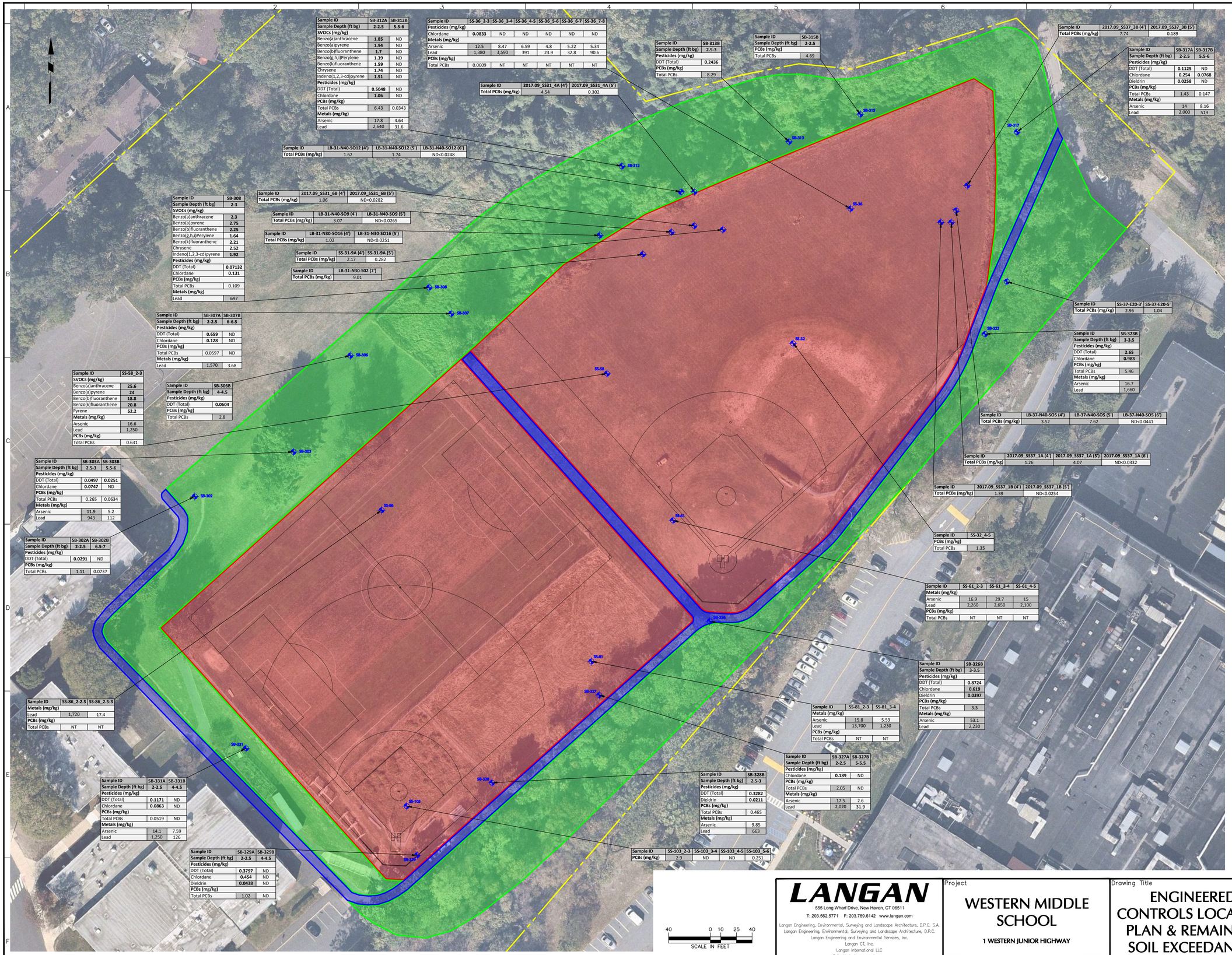
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: REMEDIAL EXCAVATION PLAN & REMAINING SOIL EXCEEDANCES

Project No.	140148201
Date	JUNE 2022
Scale	1" = 40'
Drawn By	JPH
Checked By	RJW
Submission Date	JUNE 2022
Drawing No.	7
Sheet	7 of 11

LANGAN
SUBMISSION DATE: JUNE 2022
PROJECT NO. 140148201



LEGEND

- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- PROPOSED ARTIFICIAL TURF ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED ASPHALT AND CONCRETE ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED CLEAN SOIL CAP ENGINEERED CONTROL APPROXIMATE LOCATIONS

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON–WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. THE PROPOSED REMEDIAL APPROACH FOR AOC–2 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF ARSENIC AND PESTICIDE IMPACTED SOIL BENEATH THE RECREATIONAL AREA TO A DEPTH OF 3 FEET.
3. EC LOCATIONS ARE BASED ON PRELIMINARY DESIGN PLANS FOR THE WESTERN MIDDLE SCHOOL ATHLETIC FIELDS REDEVELOPMENT PROVIDED BY LANGAN.
4. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
5. PCB = POLYCHLORINATED BIPHENYLS
6. VOC = VOLATILE ORGANIC COMPOUNDS
7. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
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9. BGS = BELOW GROUND SURFACE
10. CY = CUBIC YARDS
11. LBS = POUNDS
12. SF = SQUARE FEET
13. PPM = PARTS PER MILLION
14. EC = ENGINEERED CONTROL

Summary of Estimated Quantities - Remedial Alternative 2 -

Excavation Volume (CY)	PCBs < 50 mg/kg	32,855
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) [1.7 tons per CY]		57,926
# of Days Required for Excavation		108
# of Days Required for Backfill		36
Total # of Days Required for Construction		144
Approximate Cost		±$19.2 MIL

Remedial Summary	Remedial Excavation			Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
	Area (sf)	Volume (cy)	Weight (tons)		
Sitewide Excavation of 2 feet	420,169	31,124	52,910	34,074	57,926
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
Excavations with PCBs > 10 PPM	11,075	1,731	2,943		

Compounds to Remain in Place Under Engineered Controls

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	Concentrations Above Criteria to Remain in Place
SVOCs	mg/kg	mg/kg	mg/kg
Benzo(a)anthracene	1	1	1.85 to 25.6
Benzo(a)pyrene	1	1	1.94 to 24
Benzo(b)fluoranthene	1	1	1.7 to 18.8
Benzo(g,h,i)Perylene	8.4	1	1.39 to 1.64
Benzo(k)fluoranthene	8.4	1	1.59 to 20.8
Chrysene	84	1	1.74 to 2.52
Indeno(1,2,3-cd)pyrene	1	1	1.51 to 1.92
Pyrene	1,000	40	52.2
Pesticides	mg/kg	mg/kg	mg/kg
Chlordane	0.49	0.066	0.0747 to 1.06
Dieldrin	0.038	0.007	0.0211 to 0.0438
DDT (Total)	1.8	0.02	0.0251 to 2.65
Metals	mg/kg	mg/L	mg/L
Arsenic	10	~	11.9 to 53.1
Lead	400	~	519 to 13,700
PCBs	mg/kg	mg/L	mg/L
Total PCBs	1	~	1.02 to 9.01

Bold indicates an exceedance of the Pollutant Mobility Criteria

Shaded indicates an exceedance of the Residential Direct Exposure Criteria

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Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

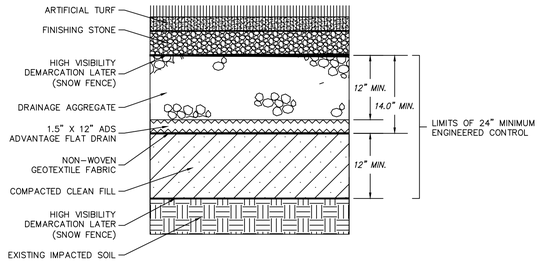
Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: ENGINEERED CONTROLS LOCATION PLAN & REMAINING SOIL EXCEEDANCES

Project No. 140148201	Drawing No. 8
Date JANUARY 2022	
Scale 1" = 40'	
Drawn By JPH / Checked By RJW	
Submission Date JANUARY 2022	Sheet 8 of 11

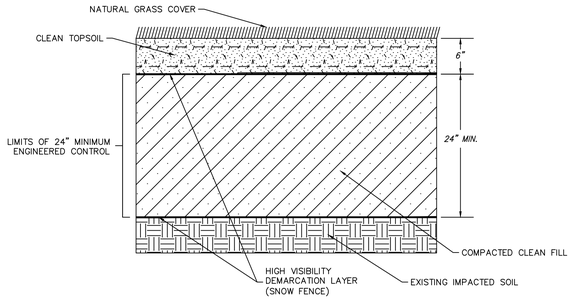
LANGAN
SUBMISSION DATE: JUNE 2022
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data7\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:55 User: jhall Style Table: Langan.stb Layout: Fig 8 - RA-2 EC Loc



1 ARTIFICIAL TURF FIELD
N.T.S

ARTIFICIAL TURF ENGINEERED CONTROL CROSS SECTION



1 LANDSCAPED AREAS
N.T.S

CLEAN SOIL CAP ENGINEERED CONTROL CROSS SECTION

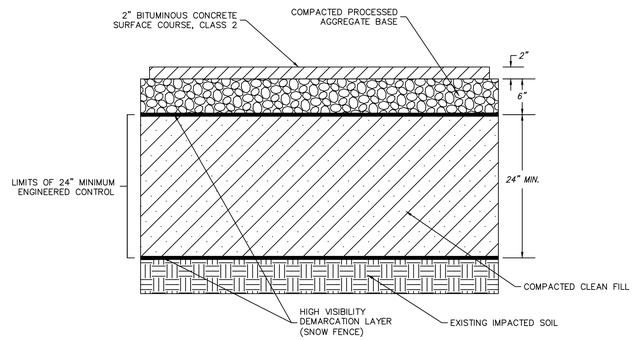
ENGINEERED CONTROLS LOCATION PLAN
SCALE: 1"=80'

LEGEND

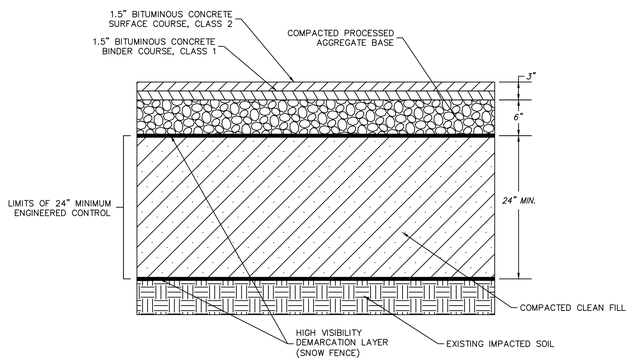
- PROPERTY BOUNDARY
- PROPOSED ARTIFICIAL TURF ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED ASPHALT AND CONCRETE ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED CLEAN SOIL CAP ENGINEERED CONTROL APPROXIMATE LOCATIONS

NOTES

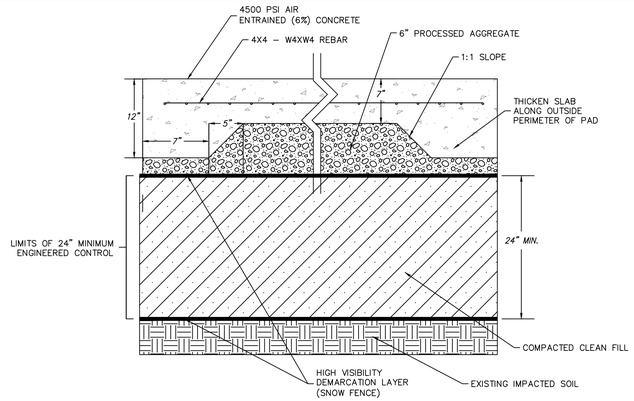
1. THE PROPOSED REMEDIAL APPROACH FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON-WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. THE PROPOSED REMEDIAL APPROACH FOR AOC-2 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF ARSENIC AND PESTICIDE IMPACTED SOIL BENEATH THE RECREATIONAL AREA TO A DEPTH OF 3 FEET.
3. EC LOCATIONS ARE BASED ON PRELIMINARY DESIGN PLANS FOR THE WESTERN MIDDLE SCHOOL ATHLETIC FIELDS REDEVELOPMENT PROVIDED BY LANGAN.
4. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
5. PCB = POLYCHLORINATED BIPHENYLS
6. VOC = VOLATILE ORGANIC COMPOUNDS
7. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
8. MG/KG = MILLIGRAMS PER KILOGRAM
9. BGS = BELOW GROUND SURFACE
10. CY = CUBIC YARDS
11. LBS = POUNDS
12. SF = SQUARE FEET
13. PPM = PARTS PER MILLION
14. EC = ENGINEERED CONTROL



1 BITUMINOUS CONCRETE SIDEWALK
N.T.S



2 BITUMINOUS CONCRETE PAVEMENT
N.T.S



3 CONCRETE PAD FOR BLEACHERS
N.T.S

ASPHALT AND CONCRETE ENGINEERED CONTROL CROSS SECTIONS

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title: ENGINEERED CONTROLS CROSS SECTIONS

Project No. 140148201	Drawing No. 9
Date JUNE 2022	
Scale NTS	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 9 of 11

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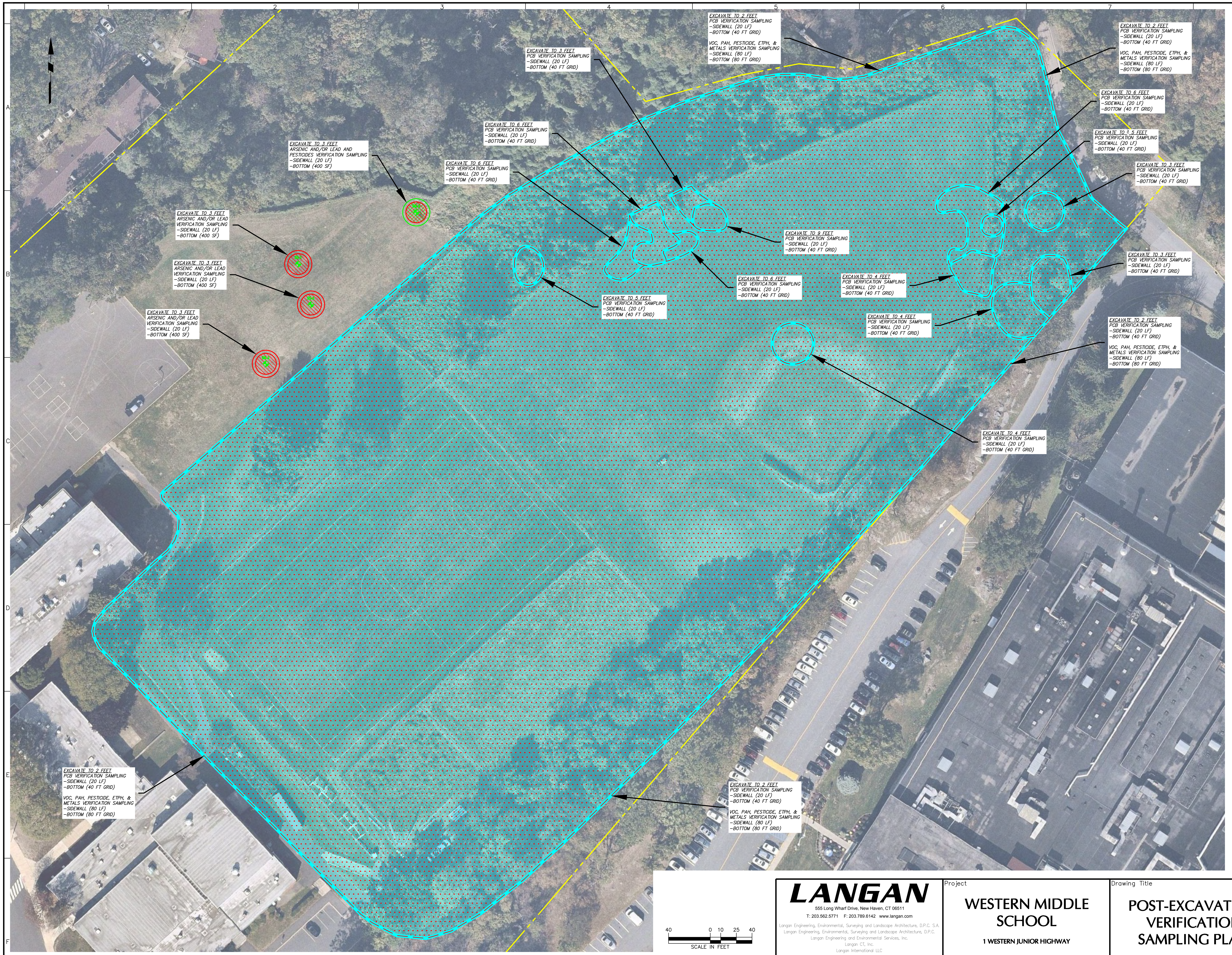
SUBMISSION DATE: JANUARY 2022
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:56 User: jhall Style Table: Langan.stb Layout: Fig 9 - EC Cross Sec



LEGEND

- PROPERTY BOUNDARY
- PCB SIDEWALL SAMPLING AREAS (1 PER 20 LF)
- PCB BOTTOM SAMPLING (40 FT GRID SAMPLING)
- VOC, PAH, PESTICIDE, ETPH, & METALS SIDEWALL SAMPLING AREAS (1 PER 80 LF)
- VOC, PAH, PESTICIDE, ETPH, & METALS BOTTOM SAMPLING AREAS (80 FT GRID SAMPLING)
- LEAD AND/OR ARSENIC BOTTOM & SIDEWALL SAMPLING (1 PER 20 LF SIDEWALL, 1 PER 400 SF BOTTOM)
- LEAD AND/OR ARSENIC, AND PESTICIDES BOTTOM & SIDEWALL SAMPLING (1 PER 20 LF SIDEWALL, 1 PER 400 SF BOTTOM)

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
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8. ETPH = EXTRACTABLE PETROLEUM HYDROCARBONS
9. COC = CONTAMINANTS OF CONCERN
10. MG/KG = MILLIGRAMS PER KILOGRAM
11. BGS = BELOW GROUND SURFACE
12. CY = CUBIC YARDS
13. LBS = POUNDS
14. FT = FOOT
15. SF = SQUARE FEET
16. LF = LINEAR FEET
17. PPM = PARTS PER MILLION
18. EC = ENGINEERED CONTROL

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SUBMISSION DATE: JUNE 2022

PROJECT NO. 140148201

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Project	Drawing Title	Project No. 140148201	Drawing No.
WESTERN MIDDLE SCHOOL 1 WESTERN JUNIOR HIGHWAY GREENWHICH CONNECTICUT	POST-EXCAVATION VERIFICATION SAMPLING PLAN	Date: JUNE 2022 Scale: 1" = 40' Drawn By: JPH / Checked By: RJW Submission Date: JUNE 2022	10 Sheet 10 of 11

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:56 User: jhall Style Table: Langan.stb Layout: Fig 10 - Ver. Sampling

LEGEND

- EXISTING GROUNDWATER MONITORING WELLS
- EXISTING GROUNDWATER MONITORING WELLS TO BE DESTROYED DURING REMEDIAL EXCAVATION ACTIVITIES
- PROPOSED POST-REMEDIATION GROUNDWATER MONITORING WELLS
- PROPERTY BOUNDARY
- PROPOSED ARTIFICIAL TURF ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED ASPHALT AND CONCRETE ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED CLEAN SOIL CAP ENGINEERED CONTROL APPROXIMATE LOCATIONS

NOTES

1. POST-REMEDIATION GROUNDWATER MONITORING WILL UTILIZE EXISTING MONITORING WELLS (MW-2, MW-5, MW-8, MW-9, AND MW-10) LOCATED TO THE NORTH, SOUTH, AND EAST OF THE WESTERN MIDDLE SCHOOL BUILDINGS AS WELL AS THE PROPOSED MONITORING WELLS (MW-101 THROUGH MW-108) LOCATED THROUGHOUT THE PROPOSED REDEVELOPMENT AREA. EXISTING MONITORING WELLS (MW-1, MW-3, MW-4, MW-6, AND MW-7) LOCATED WITHIN THE PROPOSED REDEVELOPMENT AREA WILL BE DESTROYED DURING REMEDIAL ACTIVITIES.
2. THE PROPOSED REMEDIAL APPROACH FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
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40 0 10 25 40
SCALE IN FEET

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
POST-REMEDIATION GROUNDWATER MONITORING NETWORK

Project No. 140148201	Drawing No. 11
Date JUNE 2022	
Scale 1" = 40'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 11 of 11

LANGAN
SUBMISSION DATE: JUNE 2022
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/28/2022 Time: 21:58 User: jhall Style Table: Langan.stb Layout: Fig 11 - GW Monitoring

APPENDIX A

Remedial Alternative Cost Estimates

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Appendix A
Remedial Alternative 1 Cost Estimate
Western Middle School
Greenwich, Connecticut
Langan Project No.: 140148201

Summary of Remedial Approach - Remedial Alternative 1 -
The remedial approach for remediation of impacted soil at AOC-1 under Remedial Alternative 1 includes the excavation and off-site disposal of historic fill across AOC-1 to depths of four feet below ground surface, the excavation and off-site disposal of soil containing PCBs greater than 10 mg/kg regardless of depth, the placement of a minimum of two feet of clean soil over remaining impacted soil to raise grades back to existing conditions, the construction of engineered controls to render remaining impacted soil inaccessible and physically isolated from human contact, and the placement of an Environmental Use Restriction to prohibit actions that would disturb the engineered controls or expose the remaining impacted soil underlying the engineered controls.

Summary of Estimated Quantities - Remedial Alternative 1 -		
Excavation Volume (CY)	PCBs <50 mg/kg	64,287
	PCBs ≥50 mg/kg	1,219
Excavation Area (SF)		438,153
Excavation Total (tons) [1.7 tons per CY]		111,360
Excavation Rate (tons/day) [export]		660
# of Days Required for Excavation		189
# of Days Required for Backfill		63
Total # of Days Required for Construction		252
Approximate Cost		±$28.3 MIL

Item No.	Description	Quantity		Unit Price		Total Cost
1	Remediation Facilities and Equipment					**$1,402,200**
	Mobilization, Site Preparation, Management, and Demobilization	1	LS	$750,000		$750,000
	Site Clearing & Grubbing	1	LS	$75,000		$75,000
	Access Roads	1	LS	$30,000		$30,000
	Sediment and Erosion Control Supplies	1	LS	$50,000		$50,000
	Temporary Perimeter Fencing & Screening	3,200	LF	$7	LF per Month	$291,200
	Decontamination Equipment/Supplies	1	LS	$100,000		$100,000
	Stockpiling/Laydown Area and Equipment	1	LS	$30,000		$30,000
	Dust Control/Water Truck	38	Weeks	$2,000	per Week	$76,000
2	Site Excavation					**$1,281,800**
	Excavation of PCB-impacted soil < 50 mg/kg	64,287	CY	$15	per CY	$964,300
	Excavation of PCB-impacted soil ≥ 50 mg/kg	1,219	CY	$25	per CY	$30,500
	Excavation Shoring & Support	1	LS	$25,000		$25,000
	Handling & Loading of Soil	65,506	CY	$4	per CY	$262,000
3	Transport and Disposal of Contaminated Material					**$10,654,500**
	Soils Impacted with PCBs < 50 mg/kg	109,288	Tons	$90	per Ton	$9,835,900
	Soils Impacted with PCBs ≥ 50 mg/kg	2,072	Tons	$395	per Ton	$818,600
4	Dewatering					**$150,000**
	Collection & Storage	1	LS	$50,000		$50,000
	Operation and Treatment	100,000	Gallons	$1	per Gallon	$100,000
5	Environmental Sampling					**$404,000**
	Waste Characterization Sampling (Langan Personnel and Sampling Equipment)	15	Days	$3,000	per Day	$45,000
	Waste Characterization Sampling (Laboratory Analysis; 1 sample per 500 CY & QA/QC samples)	145	Samples	$720	per Sample	$104,000
	TSCA/Hazardous Waste Profiling	1	LS	$15,000		$15,000
	AOC-1 Verification Sampling (PCBs; assumes 1 per 20 LF for sidewalls & 40 ft grid for bottom & QA/QC samples)	571	Samples	$70	per Sample	$40,000
	AOC-1 Verification Sampling (Additional COCs; assumes 1 per 80 LF for sidewalls & 80 ft grid for bottom & QA/QC samples)	147	Samples	$490	per Sample	$72,000
	AOC-2 Verification Sampling (Arsenic/Pesticides; assumes 1 per 20 LF for sidewalls & 1 per 400 SF for bottom & QA/QC samples)	33	Samples	$90	per Sample	$3,000
	Backfill Analytical Testing (Langan Personnel & Sampling Equipment)	15	Days	$3,000	per Day	$45,000
	Backfill Analytical Testing (Laboratory Analysis; 1 sample per 500 CY & QA/QC samples)	145	Samples	$550	per Sample	$80,000
6	Backfill					**$3,111,000**
	Installation of Demarcation Barrier (Bottom of Engineered Controls)	438,153	SF	$0.75	per SF	$329,000
	Installation of Demarcation Barrier (Top of Engineered Controls)	438,153	SF	$0.75	per SF	$329,000
	Backfilling with Certified Clean Fill, Delivered, Placed, Spread and Compacted	54,506	CY	$45	per CY	$2,453,000
7	Remediation Oversight					**$531,000**
	Field Engineer/Scientist	189	Days	$1,000	per Day	$189,000
	CAMP Equipment (assumes 7-week construction period for 3 seasons)	38	Weeks	$5,000	per Week	$190,000
	Construction Administration and Office Support	38	Weeks	$4,000	per Week	$152,000
8	Site Restoration					**$4,484,250**
	Loam and Seed Natural Grass Landscaped Areas	145,000	SF	$1.25	per SF	$181,000
	Installation of Asphalt and Concrete Pavement Sidewalks and Driveways	17,000	SF	$6.00	per SF	$102,000
	Concrete Curbing	3,000	LF	$60.00	per LF	$180,000
	Artificial Turf	1	LS	$1,000,000		$1,000,000
	Artificial Turf Infill Material	1	LS	$500,000		$500,000
	Artificial Turf Shock Pad	250,000	SF	$2.00	per SF	$500,000
	Artificial Turf Paint Striping	1	LS	$50,000		$50,000
	Artificial Turf Finishing Stone	1,550	CY	$75.00	per CY	$116,250
	Artificial Turf Drainage Aggregate	11,000	CY	$55.00	per CY	$605,000
	Artificial Turf Stormwater Drain	250,000	SF	$4.00	per SF	$1,000,000
	Artificial Turf Geotextile Fabric	250,000	SF	$1.00	per SF	$250,000
9	Program Management & Post-Remediation Monitoring					**$600,000**
	Program Management , Remedial Design, Construction Management, Community Relations, & Reporting	1	LS	$250,000		$250,000
	Post-Remedy Groundwater Monitoring & Reporting	1	LS	$50,000		$50,000
	Post-Remedy Engineered Control Inspection, Monitoring, & Reporting	30	Years	$10,000	per Year	$300,000
					SUBTOTAL	**$22,618,750**
					Additional Remedial Investigation/Design and Project Management (10%)	**$2,261,875**
					Contingency (15%)	**$3,392,813**
					GRAND TOTAL	**$28.27 MIL**

General Assumptions and Conditions:

- The density used for conversion from cubic yards to tons was 1.7 tons per cubic yard.
- Cost estimate is based on Langan past experience and generalized vendor estimates using 2018 dollars.
- Transportation & Disposal pricing are subject to varying market conditions, and therefore, may be subject to cost increases at the time that work is to be conducted.
- Dewatering treatment equipment and quantities have been estimated without any detailed info and can vary dramatically based upon actual conditions during construction.
- Waste Characterization sampling and backfill analytical testing frequencies are based on 1 sample per 500 cubic yards.
- A 20 day contingency has been added to the number of days required for excavation in the event delays in excavation activities occur due to unforseen conditions.
- Site restoration does not include any ancillary items (i.e. backstop, dug-out, bleachers, lighting etc.).
- Soil analytical sample totals include QA/QC samples at a rate of two QA/QC samples (field duplicate, matrix spike & matrix spike duplicate) per every 20 soil analytical samples collected.
- This estimate has been prepared for the purposes of preliminary budgeting to identify any significant cost differences between remedial alternatives. Changes in cost elements are likely to occur as a result of new information and data to be collected during engineering design and any potential pre-remedial supplemental investigations. Prior to and during remediation, there will likely be changes in the unit rates and costs for services, labor, materials and equipment that will lead to changes in the final cost of the project. Additional changes in costs may result from changes in quantities and unknowns that may be encountered during remediation. Utilization of this cost estimate information beyond the stated purpose is not recommended.

Appendix A
Remedial Alternative 2 Cost Estimate
Western Middle School
Greenwich, Connecticut
Langan Project No.: 140148201

Summary of Remedial Approach - Remedial Alternative 2 -
The remedial approach for remediation of impacted soil at AOC-1 under Remedial Alternative 2 includes the excavation and off-site disposal of historic fill across AOC-1 to depths of two feet below ground surface, the excavation and off-site disposal of soil containing PCBs greater than 10 mg/kg regardless of depth, the placement of a minimum of two feet of clean soil over remaining impacted soil to raise grades back to existing conditions, the construction of engineered controls to render remaining impacted soil inaccessible and physically isolated from human contact, and the placement of an Environmental Use Restriction to prohibit actions that would disturb the engineered controls or expose the remaining impacted soil underlying the engineered controls.

Summary of Estimated Quantities - Remedial Alternative 2 -		
Excavation Volume (CY)	PCBs <50 mg/kg	32,855
	PCBs ≥50 mg/kg	1,219
Excavation Area (SF)		438,153
Excavation Total (tons) [1.7 tons per CY]		57,926
Excavation Rate (tons/day) [export]		660
# of Days Required for Excavation		108
# of Days Required for Backfill		36
Total # of Days Required for Construction		144
Approximate Cost		±$19.2 MIL

Item No.	Description	Quantity		Unit Price		Total Cost
1	Remediation Facilities and Equipment					**$1,258,200**
	Mobilization, Site Preparation, Management, and Demobilization	1	LS	$750,000		$750,000
	Site Clearing & Grubbing	1	LS	$75,000		$75,000
	Access Roads	1	LS	$30,000		$30,000
	Sediment and Erosion Control Supplies	1	LS	$50,000		$50,000
	Temporary Perimeter Fencing & Screening	3,200	LF	$7	LF per Month	$179,200
	Decontamination Equipment/Supplies	1	LS	$100,000		$100,000
	Stockpiling/Laydown Area and Equipment	1	LS	$30,000		$30,000
	Dust Control/Water Truck	22	Weeks	$2,000	per Week	$44,000
2	Site Excavation					**$684,600**
	Excavation of PCB-impacted soil < 50 mg/kg	32,855	CY	$15	per CY	$492,800
	Excavation of PCB-impacted soil ≥ 50 mg/kg	1,219	CY	$25	per CY	$30,500
	Excavation Shoring & Support	1	LS	$25,000		$25,000
	Handling & Loading of Soil	34,074	CY	$4	per CY	$136,300
3	Transport and Disposal of Contaminated Material					**$5,845,400**
	Soils Impacted with PCBs < 50 mg/kg	55,854	Tons	$90	per Ton	$5,026,800
	Soils Impacted with PCBs ≥ 50 mg/kg	2,072	Tons	$395	per Ton	$818,600
4	Dewatering					**$125,000**
	Collection & Storage	1	LS	$50,000		$50,000
	Operation and Treatment	75,000	Gallons	$1	per Gallon	$75,000
5	Environmental Sampling					**$312,000**
	Waste Characterization Sampling (Langan Personnel and Sampling Equipment)	15	Days	$3,000	per Day	$45,000
	Waste Characterization Sampling (Laboratory Analysis; 1 sample per 500 CY & QA/QC samples)	72	Samples	$720	per Sample	$52,000
	TSCA/Hazardous Waste Profiling	1	LS	$15,000		$15,000
	AOC-1 Verification Sampling (PCBs; assumes 1 per 20 LF for sidewalls & 40 ft grid for bottom & QA/QC samples)	571	Samples	$70	per Sample	$40,000
	AOC-1 Verification Sampling (Additional COCs; assumes 1 per 80 LF for sidewalls & 80 ft grid for bottom & QA/QC samples)	147	Samples	$490	per Sample	$72,000
	AOC-2 Verification Sampling (Arsenic/Pesticides; assumes 1 per 20 LF for sidewalls & 1 per 400 SF for bottom & QA/QC samples)	33	Samples	$90	per Sample	$3,000
	Backfill Analytical Testing (Langan Personnel & Sampling Equipment)	15	Days	$3,000	per Day	$45,000
	Backfill Analytical Testing (Laboratory Analysis; 1 sample per 500 CY & QA/QC samples)	72	Samples	$550	per Sample	$40,000
6	Backfill					**$1,696,000**
	Installation of Demarcation Barrier (Bottom of Engineered Controls)	438,153	SF	$0.75	per SF	$329,000
	Installation of Demarcation Barrier (Top of Engineered Controls)	438,153	SF	$0.75	per SF	$329,000
	Backfilling with Certified Clean Fill, Delivered, Placed, Spread and Compacted	23,074	CY	$45	per CY	$1,038,000
7	Remediation Oversight					**$306,000**
	Field Engineer/Scientist	108	Days	$1,000	per Day	$108,000
	CAMP Equipment (assumes 7-week construction period for 3 seasons)	22	Weeks	$5,000	per Week	$110,000
	Construction Administration and Office Support	22	Weeks	$4,000	per Week	$88,000
8	Site Restoration					**$4,484,250**
	Loam and Seed Natural Grass Landscaped Areas	145,000	SF	$1.25	per SF	$181,000
	Installation of Asphalt and Concrete Pavement Sidewalks and Driveways	17,000	SF	$6.00	per SF	$102,000
	Concrete Curbing	3,000	LF	$60.00	per LF	$180,000
	Artificial Turf	1	LS	$1,000,000		$1,000,000
	Artificial Turf Infill Material	1	LS	$500,000		$500,000
	Artificial Turf Shock Pad	250,000	SF	$2.00	per SF	$500,000
	Artificial Turf Paint Striping	1	LS	$50,000		$50,000
	Artificial Turf Finishing Stone	1,550	CY	$75.00	per CY	$116,250
	Artificial Turf Drainage Aggregate	11,000	CY	$55.00	per CY	$605,000
	Artificial Turf Stormwater Drain	250,000	SF	$4.00	per SF	$1,000,000
	Artificial Turf Geotextile Fabric	250,000	SF	$1.00	per SF	$250,000
9	Program Management & Post-Remediation Monitoring					**$600,000**
	Program Management , Remedial Design, Construction Management, Community Relations, & Reporting	1	LS	$250,000		$250,000
	Post-Remedy Groundwater Monitoring & Reporting	1	LS	$50,000		$50,000
	Post-Remedy Engineered Control Inspection, Monitoring, & Reporting	30	Years	$10,000	per Year	$300,000
					SUBTOTAL	**$15,311,450**
					Additional Remedial Investigation/Design and Project Management (10%)	**$1,531,145**
					Contingency (15%)	**$2,296,718**
					GRAND TOTAL	**$19.14 MIL**

General Assumptions and Conditions:

- The density used for conversion from cubic yards to tons was 1.7 tons per cubic yard.
- Cost estimate is based on Langan past experience and generalized vendor estimates using 2018 dollars.
- Transportation & Disposal pricing are subject to varying market conditions, and therefore, may be subject to cost increases at the time that work is to be conducted.
- Dewatering treatment equipment and quantities have been estimated without any detailed info and can vary dramatically based upon actual conditions during construction.
- Waste Characterization sampling and backfill analytical testing frequencies are based on 1 sample per 500 cubic yards.
- A 20 day contingency has been added to the number of days required for excavation in the event delays in excavation activities occur due to unforseen conditions.
- Site restoration does not include any ancillary items (i.e. backstop, dug-out, bleachers, lighting etc.).
- Soil analytical sample totals include QA/QC samples at a rate of two QA/QC samples (field duplicate, matrix spike & matrix spike duplicate) per every 20 soil analytical samples collected.
- This estimate has been prepared for the purposes of preliminary budgeting to identify any significant cost differences between remedial alternatives. Changes in cost elements are likely to occur as a result of new information and data to be collected during engineering design and any potential pre-remedial supplemental investigations. Prior to and during remediation, there will likely be changes in the unit rates and costs for services, labor, materials and equipment that will lead to changes in the final cost of the project. Additional changes in costs may result from changes in quantities and unknowns that may be encountered during remediation. Utilization of this cost estimate information beyond the stated purpose is not recommended.

Appendix A
Remedial Alternative 3 Cost Estimate
Western Middle School
Greenwich, Connecticut
Langan Project No.: 140148201

Summary of Remedial Approach - Remedial Alternative 3 -
The remedial approach for remediation of impacted soil at AOC-1 under Remedial Alternative 3 includes the excavation and off-site disposal of historic fill across AOC-1 to depths of one feet below ground surface, the excavation and off-site disposal of soil containing PCBs greater than 10 mg/kg regardless of depth, the placement of a minimum of one feet of clean soil over remaining impacted soil to raise grades back to existing conditions, the construction of engineered controls to render remaining impacted soil inaccessible and physically isolated from human contact, and the placement of an Environmental Use Restriction to prohibit actions that would disturb the engineered controls or expose the remaining impacted soil underlying the engineered controls.

Summary of Estimated Quantities - Remedial Alternative 3 -		
Excavation Volume (CY)	PCBs <50 mg/kg	17,294
	PCBs ≥50 mg/kg	1,219
Excavation Area (SF)		438,153
Excavation Total (tons) [1.7 tons per CY]		31,472
Excavation Rate (tons/day) [export]		660
# of Days Required for Excavation		68
# of Days Required for Backfill		23
Total # of Days Required for Construction		90
Approximate Cost		±$14.6 MIL

Item No.	Description	Quantity		Unit Price		Total Cost
1	Remediation Facilities and Equipment					**$1,175,000**
	Mobilization, Site Preparation, Management, and Demobilization	1	LS	$750,000		$750,000
	Site Clearing & Grubbing	1	LS	$75,000		$75,000
	Access Roads	1	LS	$30,000		$30,000
	Sediment and Erosion Control Supplies	1	LS	$50,000		$50,000
	Temporary Perimeter Fencing & Screening	3,200	LF	$7	LF per Month	$112,000
	Decontamination Equipment/Supplies	1	LS	$100,000		$100,000
	Stockpiling/Laydown Area and Equipment	1	LS	$30,000		$30,000
	Dust Control/Water Truck	14	Weeks	$2,000	per Week	$28,000
2	Site Excavation					**$389,000**
	Excavation of PCB-impacted soil < 50 mg/kg	17,294	CY	$15	per CY	$259,400
	Excavation of PCB-impacted soil ≥ 50 mg/kg	1,219	CY	$25	per CY	$30,500
	Excavation Shoring & Support	1	LS	$25,000		$25,000
	Handling & Loading of Soil	18,513	CY	$4	per CY	$74,100
3	Transport and Disposal of Contaminated Material					**$3,464,600**
	Soils Impacted with PCBs < 50 mg/kg	29,400	Tons	$90	per Ton	$2,646,000
	Soils Impacted with PCBs ≥ 50 mg/kg	2,072	Tons	$395	per Ton	$818,600
4	Dewatering					**$100,000**
	Collection & Storage	1	LS	$50,000		$50,000
	Operation and Treatment	50,000	Gallons	$1	per Gallon	$50,000
5	Environmental Sampling					**$269,000**
	Waste Characterization Sampling (Langan Personnel and Sampling Equipment)	15	Days	$3,000	per Day	$45,000
	Waste Characterization Sampling (Laboratory Analysis; 1 sample per 500 CY & QA/QC samples)	39	Samples	$720	per Sample	$28,000
	TSCA/Hazardous Waste Profiling	1	LS	$15,000		$15,000
	AOC-1 Verification Sampling (PCBs; assumes 1 per 20 LF for sidewalls & 40 ft grid for bottom & QA/QC samples)	571	Samples	$70	per Sample	$40,000
	AOC-1 Verification Sampling (Additional COCs; assumes 1 per 80 LF for sidewalls & 80 ft grid for bottom & QA/QC samples)	147	Samples	$490	per Sample	$72,000
	AOC-2 Verification Sampling (Arsenic/Pesticides; assumes 1 per 20 LF for sidewalls & 1 per 400 SF for bottom & QA/QC samples)	33	Samples	$90	per Sample	$3,000
	Backfill Analytical Testing (Langan Personnel & Sampling Equipment)	15	Days	$3,000	per Day	$45,000
	Backfill Analytical Testing (Laboratory Analysis; 1 sample per 500 CY & QA/QC samples)	39	Samples	$550	per Sample	$21,000
6	Backfill					**$996,000**
	Installation of Demarcation Barrier (Bottom of Engineered Controls)	438,153	SF	$0.75	per SF	$329,000
	Installation of Demarcation Barrier (Top of Engineered Controls)	438,153	SF	$0.75	per SF	$329,000
	Backfilling with Certified Clean Fill, Delivered, Placed, Spread and Compacted	7,513	CY	$45	per CY	$338,000
7	Remediation Oversight					**$194,000**
	Field Engineer/Scientist	68	Days	$1,000	per Day	$68,000
	CAMP Equipment (assumes 7-week construction period for 3 seasons)	14	Weeks	$5,000	per Week	$70,000
	Construction Administration and Office Support	14	Weeks	$4,000	per Week	$56,000
8	Site Restoration					**$4,484,250**
	Loam and Seed Natural Grass Landscaped Areas	145,000	SF	$1.25	per SF	$181,000
	Installation of Asphalt and Concrete Pavement Sidewalks and Driveways	17,000	SF	$6.00	per SF	$102,000
	Concrete Curbing	3,000	LF	$60.00	per LF	$180,000
	Artificial Turf	1	LS	$1,000,000		$1,000,000
	Artificial Turf Infill Material	1	LS	$500,000		$500,000
	Artificial Turf Shock Pad	250,000	SF	$2.00	per SF	$500,000
	Artificial Turf Paint Striping	1	LS	$50,000		$50,000
	Artificial Turf Finishing Stone	1,550	CY	$75.00	per CY	$116,250
	Artificial Turf Drainage Aggregate	11,000	CY	$55.00	per CY	$605,000
	Artificial Turf Stormwater Drain	250,000	SF	$4.00	per SF	$1,000,000
	Artificial Turf Geotextile Fabric	250,000	SF	$1.00	per SF	$250,000
9	Program Management & Post-Remediation Monitoring					**$600,000**
	Program Management , Remedial Design, Construction Management, Community Relations, & Reporting	1	LS	$250,000		$250,000
	Post-Remedy Groundwater Monitoring & Reporting	1	LS	$50,000		$50,000
	Post-Remedy Engineered Control Inspection, Monitoring, & Reporting	30	Years	$10,000	per Year	$300,000
					SUBTOTAL	**$11,671,850**
					Additional Remedial Investigation/Design and Project Management (10%)	**$1,167,185**
					Contingency (15%)	**$1,750,778**
					GRAND TOTAL	**$14.59 MIL**

General Assumptions and Conditions:

- The density used for conversion from cubic yards to tons was 1.7 tons per cubic yard.
- Cost estimate is based on Langan past experience and generalized vendor estimates using 2018 dollars.
- Transportation & Disposal pricing are subject to varying market conditions, and therefore, may be subject to cost increases at the time that work is to be conducted.
- Dewatering treatment equipment and quantities have been estimated without any detailed info and can vary dramatically based upon actual conditions during construction.
- Waste Characterization sampling and backfill analytical testing frequencies are based on 1 sample per 500 cubic yards.
- A 20 day contingency has been added to the number of days required for excavation in the event delays in excavation activities occur due to unforseen conditions.
- Site restoration does not include any ancillary items (i.e. backstop, dug-out, bleachers, lighting etc.).
- Soil analytical sample totals include QA/QC samples at a rate of two QA/QC samples (field duplicate, matrix spike & matrix spike duplicate) per every 20 soil analytical samples collected.
- This estimate has been prepared for the purposes of preliminary budgeting to identify any significant cost differences between remedial alternatives. Changes in cost elements are likely to occur as a result of new information and data to be collected during engineering design and any potential pre-remedial supplemental investigations. Prior to and during remediation, there will likely be changes in the unit rates and costs for services, labor, materials and equipment that will lead to changes in the final cost of the project. Additional changes in costs may result from changes in quantities and unknowns that may be encountered during remediation. Utilization of this cost estimate information beyond the stated purpose is not recommended.

APPENDIX B

Engineered Control Variance Request Part I

LANGAN

ENGINEERED CONTROL VARIANCE REQUEST
PART I

for

WESTERN MIDDLE SCHOOL
1 Western Junior Highway
Greenwich, Connecticut

REM ID No. 14385

Prepared For:

Greenwich Public Schools
290 Greenwich Avenue
Greenwich, Connecticut 06830

Prepared By:

Langan CT, Inc.
555 Long Wharf Drive, 9th Floor
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Ryan J. Wohlstrom
Senior Project Manager

Jamie P. Barr, L.E.P.
Senior Associate/Vice President

August 2022
140148201

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1.0 INTRODUCTION

Langan CT, Inc. (Langan) has prepared this Engineered Control (EC) Variance Request Part I on behalf of Greenwich Public Schools (GPS) for the Western Middle School (WMS) property located at 1 Western Junior Highway in Greenwich, Connecticut (the "Subject Property"). The Subject Property is owned by the Town of Greenwich and is improved with grass athletic fields and recreational areas that are part of the WMS. A Site Location Map is provided as Figure 1 and a Site Plan and Existing Conditions map, depicting pertinent site features, is provided as Figure 2. The Subject Property was enrolled into the Connecticut Department of Energy and Environmental Protection (CTDEEP) Voluntary Remediation Program (VRP) on 15 June 2020 (Remediation ID No. 14385) following submission of an Environmental Conditions Assessment Form (ECAF) pursuant to Connecticut General Statutes (CGS) Section 22a-133x. This EC Variance Request is being submitted in accordance with Section 22a-133k-2(f)(2) of the CTDEEP Remediation Standard Regulations (RSRs) to address remaining impacted soil with exceedances of the Residential Direct Exposure (RDEC). Remaining impacted soil with exceedances of the GB Pollutant Mobility Criteria (PMC) will achieve regulatory compliance by applying the PCM Conditional Exemption 22a-133k-2(c)5(C).

This document presents the information required in support of Part I of the EC Variance Request for the Subject Property's athletic fields, as shown on Figure 2. Soil containing volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), various metals, and pesticides at concentrations exceeding the RDEC and GB PMC is present within historic fill underlying the Subject Property's athletic fields. Impacts to soil are attributed to historic fill imported to the Subject Property's athletic fields during construction of the WMS in the early 1960s, identified as Area of Concern 1 (AOC-1), which is the primary source of contamination at the Subject Property. The proposed remedial approach for the Subject Property consists of site-wide excavation of impacted historic fill to depths of two feet below ground surface (bgs), deep excavation of highly impacted soil up to depths of nine feet bgs, the construction of ECs to render remaining impacted soil physically isolated from human contact, placement of an Environmental Use Restriction (EUR) on the Subject Property to prohibit actions that could disturb the ECs or the remaining impacted soil, and development of a monitoring and maintenance plan to maintain the ECs indefinitely. This EC Variance Request is being submitted to seek the Commissioner's approval to use ECs due to the following circumstances:

1. The cost to remediate the polluted soil is significantly greater than the cost of installing and maintaining an engineered control for such soil and conducting groundwater monitoring that complies with Section 22a-133k-3(h) of the RSRs.
2. The significant greater cost of remediation outweighs the risk to human health and the environment if the engineered control fails to prevent human exposure or mobilization of the pollutants in soil.

This EC Variance Request seeks approval to use the following three proposed ECs in one contiguous release area (AOC-1):

1. Artificial Turf EC - A minimum 24-inch thick EC consisting of (from bottom to top) a high visibility demarcation layer above the remaining impacted soil, a minimum of 12 inches of clean fill to achieve grading requirements, a layer of non-woven geotextile fabric, a flat drain, a minimum of 12 inches of clean crushed stone, and finished with a high visibility demarcation layer to render remaining impacted soil inaccessible and physically isolated. Above the EC's high visibility demarcation layer will be a layer of clean crushed finishing stone followed by artificial turf field components to the finished grade. The layer of clean crushed finishing stone and the artificial turf materials would be above the EC to allow for general maintenance to occur.

1. Asphalt and Concrete EC – A minimum 24-inch thick EC consisting of (from bottom to top) a high visibility demarcation layer above remaining impacted soil, a minimum of 24 inches of clean fill to achieve grading requirements, and finished with a high visibility demarcation layer to render remaining impacted soil inaccessible and physically isolated. Above the EC's high visibility demarcation layer will be an approximately 6 inch layer of crushed stone followed by 2 to 7 inches of asphalt and/or concrete to the finished grade. The layer of crushed stone and the asphalt and/or concrete would be above the EC to allow for general maintenance to occur.

2. Clean Soil Cap EC - An minimum 24-inch thick EC consisting of (from bottom to top) a high visibility demarcation layer above remaining impacted soil, a minimum of 24 inches of clean fill to achieve grading requirements, and finished with a high visibility demarcation layer to render remaining impacted soil inaccessible and physically isolated. Above the EC's high visibility demarcation layer will be an approximately 6 inch layer of topsoil followed by natural grass to the finished grade. The layer of topsoil and natural grass would be above the EC to allow for general maintenance to occur.

The locations of the proposed ECs are shown on Figures 3 and 5 and details of the proposed ECs are provided on Figure 6. This EC Variance Request is in accordance with the requirements of the RSRs and the CTDEEP Guidance Document "Engineered Controls Pursuant to Section 22a-133k-2(f)(2)(B) of the Connecticut RSRs February 2009, Revised February 2021." The ECs proposed for use in this document are consistent with ECs previously approved by the CTDEEP and are established methods of EC construction for similarly contaminated soils in Connecticut. Similar ECs and remedial actions have been approved and are being implemented at Greenwich High School (Remediation ID No. 13334), which is also owned by the Town of Greenwich.

1.1 Site Setting and History

The Subject Property is approximately 21.4-acre parcel identified as Tax ID 057 04-4519/S by the Town of Greenwich Assessor's office. The athletic fields and recreational area, referred to throughout this report as AOC-1 and AOC-2, respectively, are located on the northeastern portion of the Subject Property and total an approximately 10.4-acre portion of the larger 21.4-acre parcel. The Subject Property is bound to the northwest by a wooded area followed by residential properties, to the north/northeast by a wooded area followed by the Town of Greenwich's Holly Hill Resource Recovery Facility and Muskrat Pond Drive, to the east/southeast by wooded areas followed by several commercial properties, and to the south/southwest by an asphalt-paved parking area and WMS building followed by Western Junior Highway. The athletic fields are situated on an elevated plateau with grades approximately 10 to 20 feet higher than that of the WMS buildings and the recreational area. Utilities provided to the Subject Property include municipal water, stormwater drainage and sanitary sewer, electricity, and communications. Heating is provided by oil-fired boilers; fuel oil for heating is stored on-site in three underground storage tanks (USTs) (5,000-gallon, 7,500-gallon, and 8,000-gallon in size).

Prior to the 1960s, the Subject Property was undeveloped woodlands. During construction of the WMS in the early-1960s, the athletic fields at the Subject Property were filled and graded to meet final design grades using blasted rock (which may have been blasted on-site) and imported fill material of unknown origin. Based on a review of historical aerial photographs and topographic maps, the areas beneath the WMS buildings (which are located at elevations approximately 10 to 20 feet below the athletic fields) are believed to not have been constructed on the imported fill used on the elevated athletic fields. The Subject Property has been used exclusively as the WMS since its construction in the early 1960s.

1.2 Physical Setting

1.2.1 Topography

The Subject Property is generally level in the area of the athletic fields at an elevation ranging between approximately 78 and 85 feet above mean sea level (msl) while the recreational area located to the northwest of the athletic fields is at an elevation ranging between 58 and 61 feet above msl. The athletic fields are situated on an elevated plateau with grades approximately 10 to 20 feet higher than that of the WMS buildings and the grass-covered recreational area. Also, the northern edge of the Subject Property slopes down toward the adjacent Holly Hill Resource Recovery Facility and the southeastern edge of the Subject Property slopes down toward the adjacent commercial properties.

1.2.2 Geology

The subsurface conditions of the Subject Property have been determined following the completion of numerous investigations completed by Langan between 2016 and 2021. The subsurface at the athletic fields consists of topsoil followed by a layer of fill overlying successive strata of blasted rock, glacial till, and bedrock. The subsurface at the recreational area consists of topsoil followed by a layer of fill overlying glacial till, and bedrock. A more detailed description of each layer encountered is provided below:

Surficial Material – Approximately 3 to 6 inches of topsoil.

Fill Layer – Beneath the athletic fields, the non-native fill material can generally be characterized as brown to dark-brown, coarse- to fine-grained sand, with some fine-gravel and varying amounts of debris containing brick, charcoal, glass, ceramic, wood, metal, fibers, organic material, and construction and demolition debris. Although fill material was also observed beneath the grass-covered recreational area, located topographically down-gradient and to the northwest of the athletic fields, the composition of the fill within this area differed from that beneath the athletic fields and consists of silty sand with gravel, similar to the presumed native soils encountered at the Subject Property and may represent reworked native materials that had been moved during construction activities in the early 1960s. Further, this fill was not observed to contain the same deleterious material identified within the fill beneath the athletic fields. Across the athletic fields, the fill material has been encountered at depths ranging from 2 to 10 feet below grade surface (bgs).

Blasted Rock – A layer of blasted rock up to approximately 11-feet thick was encountered beneath the fill material throughout the athletic fields. It appears that prior to the import of fill material, grades at the athletic fields were first raised using rock that was likely blasted on-site. The layer of blasted rock observed beneath the fill material on the slope between the athletic fields and the down-gradient recreational area was generally observed at thicknesses ranging from 1 to 9 feet. Blasted rock was not observed beneath the recreational areas.

Till – Beneath some areas of the Subject Property, a layer of till was encountered beneath the blasted rock at the athletic fields and beneath the fill at the recreational area. The till is generally composed of brown to yellow-brown fine to coarse sand with varying proportions of silt, gravel, and cobbles and extends to depths ranging from 15 to 26 feet bgs.

Bedrock – Competent bedrock was encountered underlying the blasted rock and/or glacial till at the athletic fields. The top of the bedrock was inferred based upon auger refusal and split spoon samples. The bedrock underlying the site consists of gray mica schist and white gneiss, the top of which was encountered at depths ranging from 6 to 26 feet bgs.

1.2.3 Hydrogeology

According to the Water Quality Classifications Greenwich, CT map (CTDEEP, October 2017), the groundwater underlying the Subject Property is classified as GB. Based on the Connecticut Water Quality Standards and Criteria, class GB designated uses are industrial process water and cooling water, and base flow for hydraulically-connected water bodies; groundwater is presumed not suitable for human consumption without treatment. Overburden groundwater has been encountered on the southwestern portion of the athletic fields and western portion of the recreational area. Overburden groundwater was observed between 7 feet bgs at the southwestern portion of the athletic fields and 16.5 feet bgs at the western portion of the recreational area, which is approximately between elevations 66 and 39.5 feet above msl, respectively. Overburden groundwater has not been observed on the central or eastern portions of the athletic fields; however, bedrock groundwater has been encountered in these areas. Bedrock groundwater was observed between 14 and 25 feet bgs at the central portion of the athletic fields and between 18.5 and 22 feet bgs at the eastern portion of the athletic fields, which is approximately between elevations 52 and 63 feet above msl on the central portion and 54 and 60.5 feet above msl on the eastern portion. The inferred bedrock groundwater flow direction is to the southwest.

The closest surface water body to the Subject Property is an unnamed stream located approximately 400 feet to the east of the Subject Property. The unnamed stream is classified as Surface Water Quality SB with designated uses as habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation. The stream empties into Byram Harbor, approximately 1,000 feet to the southeast, classified as Surface Water Quality SA. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. According to the National Wetlands Inventory online web viewer (https://www.fws.gov/wetlands/data/mapper.html), the closest wetlands are 1,600 feet to the southeast and classified as estuarine and marine.

1.3 Potential Migration Pathways and Receptors

The primary migration pathways being assessed as part of remedial design are ingestion and dermal contact exposure pathways. Additional potential migration pathways to be considered for contaminated properties generally include; leaching of chemicals from impacted soils, groundwater transport through soil and subsurface conduits, and vapor migration through unsaturated soils. Based on subsurface investigations completed between 2016 and 2021, chemical impacts within the fill material at the Subject Property are not expected to be migrating off-site through groundwater migration or discharge to surface water.

Based on observations made at the Subject Property (and supplemented by a desktop review of the surrounding areas) risks to ecological communities have not been identified. This conclusion is based on the lack of sensitive environmental resources (i.e., habitat that could support and sustain an ecological community) at the Subject Property and in the surrounding vicinity. Given the current use of the Subject Property as a maintained athletic field and recreational area, ecological receptors are not likely to come in contact with site-related impacts given the lack of suitable habitat for foraging and nesting. Additionally, there are no sensitive environmental resources in the immediate vicinity of the Subject Property to which site-related impacts (specifically PCBs) could potentially migrate. As such, ecological risk evaluations are not warranted at the site.

A drinking water well receptor survey was performed in 2018 and a Human Health Risk Assessment (HHRA) was submitted to the CTDEEP in 2016. Based on the results of the HHRA, the calculated site-specific risk values for receptors at the Subject Property fell within published USEPA acceptable ranges, indicating adverse health effects are unlikely to occur. The results of these documents indicate that soil impacts that will remain following implementation of the proposed ECs do not pose a significant risk to human health or the environment. Furthermore, failure of the proposed EC would not present a significant short-term risk to human health or the environment if it were to occur. Extensive damage to the EC would be required for a significant exposure risk to be present and with the placement of an EUR and the implementation of a maintenance and monitoring plan, the potential for a failure to the EC will be actively mitigated.

1.4 Regulatory Status and Applicable Criteria

The Subject Property is enrolled in the CTDEEP VRP under CGS Section 22a-133x; therefore, the CTDEEP RSRs apply to the Subject Property and will be used as the remedial standards for site compliance. The analytical results for soil and groundwater obtained at the Subject Property are compared to the numeric criteria listed in the RSRs sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies (RCSA) dated January 1996 (amended 16 February 2021), and to numeric criteria in the Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances (APS) and Certain Alternative Criteria dated 10 December 2015 (revised 20 September 2018). The RSRs were developed by the CTDEEP to define the remediation performance standards for soil, groundwater, specific numeric cleanup criteria, and processes for establishing alternative site-specific standards.

Based upon the Subject Property's use as a school and it being located within a GB classified area, the applicable soil criteria for the Subject Property is the RDEC and the GB PMC. Due to the Subject Property being located within a GB classified area, the applicable groundwater criteria for the Subject Property is the Surface Water Protection Criteria (SWPC) and the Groundwater Volatilization Criteria (GWVC). The purpose of this EC Variance is to address remaining

exceedances in soil of the RDEC for PCBs, SVOCs, pesticides, and metals in accordance with Section 22a-133k-2(f)(2) of the CTDEEP RSRs. Remaining impacted soil with exceedances of the GB PMC for SVOCs and pesticides will achieve regulatory compliance by applying the PMC Conditional Exemption 22a-133k-2(c)5(C) of the CTDEEP RSRs.

Due to elevated concentrations of PCBs detected in soil, the Subject Property is also under the jurisdiction of the United States Environmental Protection Agency (USEPA) Toxic Substances Control Act (TSCA). PCB-impacted soil is being managed as PCB remediation waste as defined in §761.3 of Chapter 40 of the Code of Federal Regulations, Part 761 (40 CFR 761). The Town of Greenwich and Langan are also working with the EPA Region 1 PCB Coordinator with regard to investigation and remediation of PCBs. The RAP being submitted in conjunction with this EC Variance Request acts as the Risk Based Corrective Action Plan for the remediation of PCB-impacted soil at the Subject Property in accordance with 40 CFR § 761.61(c).

2.0 SUMMARY OF INVESTIGATIONS

The release at the Subject Property is attributed to historic fill imported to the Subject Property to raise grades at the athletic fields during construction of the WMS in the early 1960s. The locations and extents of the athletic fields and recreational area are shown on Figure 2. The following sections summarize the Environmental Site Investigations (ESI) completed by Langan at the Subject Property in the areas of the proposed ECs between June 2016 and March 2022. Previous environmental reports for the Subject Property are included in Appendix A.

2.1 June 2016 Limited Phase II ESI

In June 2016, the building committee for the New Lebanon School (a Greenwich public school serving students, kindergarten through 5th grade) was evaluating the construction of a temporary swing space for its students on the grass-covered recreational area of the Subject Property. As part of the evaluation, Langan was engaged to sample soils in the proposed construction area to evaluate potential environmental concerns. The initial evaluation included the collection of three subsurface soil samples (at 2 to 2.5 feet bgs) for analysis of VOCs, SVOCs, PCBs, pesticides, herbicides, extractable petroleum hydrocarbons (ETPH), and metals; and the collection of eight surficial soil samples (0 to 6 inches bgs) for analysis of metals.

Langan used the RSRs, specifically the RDEC, as a screening level criterion to identify driver compounds that may require additional assessment. Arsenic was identified above the RDEC at depths ranging from 0 to 6 inches at two locations and from 2 to 2.5 feet bgs at one location. PCBs were detected in the three soil samples collected from 2 to 2.5 feet bgs at concentrations ranging from 0.0533 to 0.275 milligram per kilogram (mg/kg), below the RDEC of 1 mg/kg. The analytical results of the June 2016 investigation are summarized in Appendix B and are shown on figures in Appendix C.

Based on the results of the sampling completed for the proposed New Lebanon swing space, Langan completed a HHRA to provide a site-specific evaluation of potential health risks associated with the constituents identified in soils exceeding the RDEC. The HHRA was submitted to the Connecticut Department of Public Health (CTDPH) for review and comment. Following their initial review, the CTDPH requested that the remaining portions of the WMS athletic fields be tested and incorporated into the HHRA. Although WMS was no longer being considered as a swing space location for New Lebanon students, the GPS administration continued with the testing in order to finalize the HHRA as requested by the CTDPH.

2.2 July and August 2016 Surficial Soil Investigation

Langan conducted soil sampling at the athletic fields in July 2016, which included the advancement of 30 shallow soil borings and the collection of 30 surficial soil samples directly

below the grass cover (0 to 3 inches) for analysis of SVOCs, PCBs, pesticides, herbicides, and metals. Laboratory analytical results of the top 3 inches of surficial soils identified impacts from PCBs, arsenic, lead, and pesticides (chlordane) at concentrations exceeding the RDEC. The analytical results of the July and August 2016 investigation are summarized in Appendix B and are shown on figures in Appendix C.

The July 2016 investigation results were incorporated into a revised HHRA. Based on the results of the HHRA, the calculated site-specific risk values for receptors at the Subject Property fell within published USEPA acceptable ranges, indicating adverse health effects are unlikely to occur. However, in coordination with CTDPH, the GPS administration made the conservative decision to fence and close the fields until additional assessment could be completed and all appropriate parties provided input. A copy of Langan's September 2016 HHRA is included in Appendix A.

Upon discussion of the results, the GPS, Langan, CTDPH, and CTDEEP agreed to complete soil delineation for six areas of the Subject Property's athletic fields. Three of the proposed delineation areas (represented by soil sample locations SS-9, SS-22, and SS-24) were related to lead and chlordane contamination and the remaining three areas (represented by soil sample locations SS-28, SS-31, and SS-37) were related to PCB contamination.

2.3 October 2016 Lead and Chlordane Soil Delineation

Horizontal and vertical delineation sampling for the three previously identified lead and chlordane exceedances (represented by soil sample locations SS-9, SS-22, and SS-24) was conducted on 8 August 2016 and 7 October 2016 and included the advancement of 38 shallow soil borings. The analytical results of the October 2016 lead and chlordane delineation are summarized in Appendix B and are shown on figures in Appendix C. The results of the delineation sampling were used to define the vertical and horizontal extent of soil excavation activities to remove elevated levels of lead and chlordane at the three areas. The results of the delineation sampling successfully defined the extent of remediation proposed for areas of the athletic fields with lead and chlordane-contaminated surficial soil. Delineation sampling determined elevated concentrations of the lead and chlordane were limited to surficial soils above 1 foot bgs.

Due to the discovery of elevated concentrations of PCBs and pesticides within shallow soil at the athletic fields during the July and August 2016 investigation, 16 shallow soil samples were collected within the recreational area for analysis of PCBs and pesticides as a part of the October 2016 delineation of lead and chlordane exceedances. The analytical results of the additional recreational area investigation are summarized in Appendix B and are shown on figures in Appendix C. Chlordane and PCBs were detected above laboratory reporting limits but below the applicable CTDEEP criteria in shallow soil samples collected from the recreational area.

2.4 October 2016 through October 2017 PCB Soil Delineation

Horizontal and vertical delineation sampling for the three previously identified PCB exceedance areas (represented by soil sample locations SS-28, SS-31, and SS-37) began in October 2016 and continued through October 2017. Delineation of the three PCB exceedance areas included the advancement of more than 100 soil borings and the laboratory analysis of nearly 200 soil samples. The analytical results of the 2016 through 2017 PCB delineation are summarized in Appendix B and are shown on figures in Appendix C. Soil delineation sampling at these three exceedance areas identified PCBs in historic fill at elevated concentrations (up to 543 mg/kg) ranging between 0 and 9 feet bgs. The results of the delineation sampling were used to define the vertical and horizontal extent of the proposed soil excavation activities to remove elevated concentrations of PCBs in exceedance of 10 mg/kg at the three locations.

Based on the findings of the three PCB exceedance area delineations, it was determined further investigation of PCBs within historic fill both vertically and horizontally was needed across both the recreational area and athletic fields. In June 2017 Langan advanced 66 soil borings evenly spaced across the recreational area and the athletic fields to investigate the presence of PCBs in historic fill. The analytical results of the June 2017 PCB investigation are summarized in Appendix B and are shown on figures in Appendix C. Two soil samples between ground surface and 1 foot bgs were collected from each boring and submitted for analysis of PCBs. The investigation confirmed the presence of historic fill containing varying amounts of deleterious debris (i.e. construction and demolition debris, charcoal, ceramic) across the athletic field's portion of the Subject Property. PCBs at concentrations exceeding the RDEC (up to 21 mg/kg) were found in 7 of the 66 soil borings.

Following the receipt of initial delineation activities in October 2016, it was determined the fill area was subject to the Toxic Substances Control Act (TSCA) with regard to PCBs detected in soil at concentrations exceeding 50 milligrams per kilogram (mg/kg). Soil with PCB concentrations greater than or equal to 50 mg/kg are classified as PCB Remediation Waste in §761.3 of Chapter 40, Code of Federal Regulations, Part 761 (40 CFR Part 761). Because PCB concentrations at or above this level were identified within the historic fill layer at AOC-1, the Town of Greenwich and Langan worked with the USEPA Region 1 PCB Coordinator with regard to investigation and remediation of PCBs at the Subject Property.

On 23 January 2017, Langan submitted a Significant Environmental Hazard (SEH) Notification to the CTDEEP due to elevated concentrations of PCBs that were discovered in shallow soils during the PCB soil delineation sampling. SEHs are specific conditions defined in Section 22a-6u of the CGS, for which property owners have an obligation to notify the CTDEEP when they become aware of such conditions. These conditions are termed significant hazards because they pose a potential health risk from short-term exposure to individuals or the environment. Notification is required to CTDEEP when soil within two feet of the surface has been reported to contain a

constituent at a concentration at or above 15 times the residential DEC. A copy of Langan's 23 January 2017 SEH Notification is included in Appendix A.

Based on the sampling data received during the delineation of the three PCB exceedance areas it was determined PCB-contaminated soils extended beyond the athletic fields (to the north of SS-31 and to the east of SS37) and into the adjoining wooded slopes on the Subject Property.

2.5 October 2018 Supplemental Soil and Groundwater Investigation

Pursuant to discussions with the CTDEEP, the CTDPH, and the USEPA, supplemental environmental sampling was completed to evaluate the extent of PCB-impacted soils along the boundaries of the athletic fields, further evaluate the nature and extent of the impacted fill material beneath the athletic fields, and evaluate the condition of the Subject Property's groundwater. The supplemental investigation included advancement of 13 soil borings, 24 hand auger borings, the installation of two overburden and two bedrock groundwater monitoring wells, the analysis of 108 soil samples and four groundwater samples. The analytical results of the October 2018 investigation are summarized in Appendix B and are shown on figures in Appendix C.

The supplemental soil investigation determined historic fill is present throughout the athletic fields and extends to the adjacent areas surrounding the athletic fields to the north, south, and east on the Subject Property. The historic fill contained concentrations of VOCs, SVOCs, pesticides, metals, and PCBs at concentrations exceeding the RDEC and GB PMC. The sampling data showed concentrations of contaminants generally decreased as you move further away from the athletic fields.

Two overburden groundwater monitoring wells were installed on the western portion of the Subject Property; one at the southern edge of the athletic fields and one at the southwestern edge of the recreational area. Overburden groundwater was observed between 9 feet bgs (athletic fields) and 16.5 feet bgs (recreational area). Two bedrock groundwater monitoring wells were installed on the eastern portion of the Subject Property; one on the northcentral portion of the athletic fields and one on the northeastern portion of the athletic fields. Bedrock groundwater was observed at 22 feet bgs (northcentral athletic fields) and 18.5 feet bgs (northeastern athletic fields). VOCs, ETPH, and various metals were detected above laboratory reporting limits but below applicable CTDEEP criteria in groundwater. SVOCs, pesticides, herbicides, and PCBs were not detected above laboratory reporting limits in groundwater. The contaminants encountered in soils were not identified in groundwater exceeding the applicable criteria. Given that the athletic fields have been open to infiltration since placement of the fill in the early-1960s, the results indicate the contaminants present in the fill material are not leaching into groundwater at concentrations that would warrant action.

Langan completed a Water Supply Well Receptor Survey on 25 April 2018, prior to the October 2018 soil and groundwater investigation. The survey confirmed there are no water supply wells within a 500 foot radius of the Subject Property. A copy of Langan's 25 April 2018 Water Supply Well Receptor Survey is included in Appendix A.

2.6 September 2020 Soil and Groundwater Investigation

Following enrollment into the CTDEEP VRP on 15 June 2020, the CTDEEP requested further assessment of the historic imported fill material to confirm it did not extend west of the athletic fields and below the WMS buildings. The investigation was completed between 2 and 17 September 2020 and included the advancement of five soil borings, the installation of three bedrock groundwater monitoring wells, and the collection of five soil samples and three bedrock groundwater samples. The analytical results of the September 2020 investigation are summarized in Appendix B and are shown on figures in Appendix C.

Five soil borings were advanced along the western boundary of the athletic fields between the fields and the WMS buildings. Historic fill was not observed within any of the five soil borings and laboratory analytical results did not identify any non-naturally occurring compounds above background within soil. Based on the investigation the historic fill material and its related contaminants do not extend below the WMS buildings.

Three bedrock groundwater monitoring wells were installed on the western portion of the athletic fields. Like the previously installed bedrock groundwater monitoring wells on the eastern portion of the athletic fields, water bearing fractures within bedrock varied by location. Bedrock groundwater was observed between 13 and 25 feet bgs on the western portion of the athletic fields. Laboratory analytical results of groundwater samples identified VOCs and various metals above laboratory reporting limits but below the applicable CTDEEP criteria. PCBs, pesticides, and herbicides were not detected above laboratory reporting limits. Groundwater investigation data was found to be consistent with the previous investigations, indicating the contaminants present in the fill material were not leaching into groundwater at concentrations that would warrant action.

2.7 August 2021 Soil Delineation Investigation

Following discussion and review of previously completed investigations, the CTDEEP requested that additional soil delineation activities be completed at the Subject Property. The primary objective of the August 2021 soil delineation investigation was to further define the nature and extent of historical fill-related contamination along the boundaries of the Subject Property's athletic fields. The delineation investigation was completed between 16 and 23 August 2021 and included the advancement of 32 soil borings, the excavation of seven test pits, and the collection

and analysis of 63 soil samples. The analytical results of the August 2021 investigation are summarized in Appendix B and are shown on figures in Appendix C.

The 32 soil borings were installed along the boundaries of the athletic fields to the north, south, east, and west. Two soil samples were collected from each soil boring between 0.5 and 7 feet bgs. Laboratory analytical results identified VOCs, SVOCs, pesticides, metals, and PCBs at concentrations exceeding the applicable CTDEEP criteria within historic fill to depths of 4 feet bgs at the boundaries of the athletic fields.

Seven test pits were advanced within a mounded area on the southeast-central portion of the athletic fields to determine what the mound was comprised of. Langan observed the mound consisted of 10 to 12 inches of topsoil underlain by historic fill material followed by blasted rock and bedrock.

2.8 March 2022 Soil, Groundwater, and Soil Vapor Investigation

Based on the findings of August 2021 soil delineation investigation, the CTDEEP requested that additional soil delineation activities be completed to further define the nature and extent of historical fill-related contamination along the border of the Subject Property's athletic fields and parcel boundary. In addition to further soil delineation activities, the CTDEEP also requested the installation and sampling of groundwater monitoring wells and soil vapor monitoring points to assess the concentrations of VOCs in groundwater and soil vapor in the vicinity of the Western Middle School building for use in the evaluation of the volatilization pathway and potential risk.

The investigation was completed between 18 February and 15 March 2022 and included the advancement of 28 soil borings and the collection and analysis of 30 soil samples, the installation of three groundwater monitoring wells and the collection and analysis of five groundwater samples, and the installation of three soil vapor monitoring points and collection and analysis of three soil vapor samples. The analytical results of the March 2022 investigation are summarized in Appendix B and are shown on figures in Appendix C.

The 28 soil borings were installed using stainless steel hand augers along the boundaries of the athletic fields and along the parcel boundary. Laboratory analytical results identified SVOCs, pesticides, metals, and PCBs at concentrations exceeding the applicable CTDEEP criteria to depths of 2 feet bgs at the boundaries of the athletic fields. Historic fill material consistent with the material underlying the athletic fields was only observed within 4 of 22 soil borings located along the Subject Property parcel boundary and/or along the toe of the slope that extends along the perimeter of the athletic fields, further delineating the extent of impacted historic fill material and future remedial excavations.

The three groundwater monitoring wells and three soil vapor monitoring points were installed southwest of the athletic fields along the exterior of the Western Middle School building.

Groundwater samples were collected from the three newly installed monitoring wells as well as two existing monitoring wells located along the exterior of the Western Middle School building. VOCs were not identified in groundwater or soil vapor at concentrations exceeding applicable RSR criteria. Groundwater investigation data was found to be consistent with the previous investigations, indicating the contaminants present in the fill material were not leaching into groundwater at concentrations that would warrant action. Soil vapor analytical results indicate that vapor intrusion mitigation will not be required for the Western Middle School building.

3.0 REMEDIAL APPROACH

The proposed remedial approach for the Subject Property's AOC-1 consists of the following tasks:

- Excavation and off-site disposal of historic fill underlying AOC-1 to a depth of two feet or to the underlying blasted rock, bedrock, or native soil layer should it be encountered first.
- Excavation and off-site disposal of all soil containing PCBs greater than the I/C DEC of 10 mg/kg, regardless of depth.
- Construction of ECs to render remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg inaccessible in accordance with 22a-133k-2(f)(2)(C) of the CTDEEP RSRs.
- Placement of clean fill over remaining impacted soil with PCBs greater than 1 mg/kg and less than 10 mg/kg to raise grades back to existing conditions. The placement of clean fill and the construction of ECs will total a minimum of two feet of clean material above remaining impacted soil.
- Placement of an EUR on the Subject Property that would prohibit actions that would disturb the ECs or expose remaining impacted soil in accordance with 22a-133k-2(f)(2)(c)(iii) of the CTDEEP RSRs.
- Application of the PMC Conditional Exemption to achieve regulatory compliance for remaining impacted soil with exceedances of the GB PMC in accordance with 22a-133k-2(c)5(C) of the CTDEEP RSRs.

Following remedial excavations, soils with exceedances of the RDEC and GB PMC will remain in place. The proposed ECs will render the remaining impacted soil with exceedances of the RDEC inaccessible and physically isolated from human contact in accordance with Section 22a-133k-2(f)(2)(C)(vii) of the RSRs. Remaining impacted soil with exceedances of the GB PMC will achieve regulatory compliance by applying the PMC Conditional Exemption 22a-133k-2(c)5(C).

Under this remedial approach, the lead and chlordane remediation areas will be removed as a consequence of removal of the upper 2 feet of soil. Additionally, targeted remedial excavations of elevated concentrations of arsenic and pesticides are proposed at the recreational area (AOC-2) located topographically down-gradient and northwest of the athletic fields. Remedial excavation areas are shown on Figure 4, the proposed EC locations are shown on Figures 3 and 5, and details of the proposed ECs are provided on Figure 6.

Remedial excavations at AOC-1 including the proposed site-wide excavation to a minimum depth of two feet and the deeper excavations at areas where PCB concentrations exceed 10 mg/kg will not be impacted by the implementation of the three proposed ECs as remedial excavations will

be completed prior to EC construction. Remedial actions including the various remedial excavations and the implementation/construction of the three proposed ECs will not impact the integrity or operation of any proposed ECs that may be completed. The final design plans and specific details regarding the proposed ECs will be presented within the forthcoming the EC Variance Request Part II.

The following Sections describe the proposed ECs and EUR to be implemented for the remediation of AOC-1.

3.1 Artificial Turf EC Description

Artificial turf athletic fields including a baseball field, softball field, and soccer field are proposed at the Subject Property's existing athletic fields. Remedial excavations in these areas will be capped by clean imported fill, crushed stone, and finished to grade with artificial turf. The artificial turf EC will render the remaining impacted soil with exceedances of the RDEC inaccessible and physically isolated from human contact in accordance with Section 22a-133k-2(f)(2)(C)(vii) of the RSRs.

The artificial turf EC will extend a minimum of 24 inches deep and will be generally comprised of the following (from top to bottom):

1. Artificial turf components (includes artificial grass surface, cushioning)
2. A layer of clean crushed finishing stone base
3. A high visibility demarcation layer (top of EC)
4. A minimum of 12 inches of clean crushed stone
5. A high density polyethylene (HDPE) flat drain
6. A non-woven geotextile fabric
7. A minimum of 12 inches of clean fill to achieve grading requirements
8. A high visibility demarcation layer (bottom of EC)
9. Existing site soil

The EC will be composed of the layers between the two high visibility demarcation layers, allowing general field maintenance to be completed on the overlying artificial turf field components. The proposed artificial turf athletic fields (baseball, softball, and soccer fields) and associated spectator areas, and walkways would allow the athletic fields to once again be used by the school and community. The extent of the artificial turf EC is shown on Figures 3 and 5 and details of the proposed artificial turf EC are provided on Figure 6.

3.2 Asphalt and Concrete EC Description

An asphalt and/or concrete paved walkways, driveways, and spectator areas are proposed bisecting the artificial turf athletic fields between the proposed baseball field and soccer field. Additionally, an asphalt paved walkway and driveway is proposed along the southern, eastern, and western perimeter of the artificial turf athletic fields. Remedial excavations in these areas will be capped by clean imported fill and finished to grade with asphalt and/or concrete. The asphalt and concrete EC will render the remaining impacted soil with exceedances of the RDEC inaccessible and physically isolated from human contact in accordance with Section 22a-133k-2(f)(2)(C)(vii) of the RSRs.

The asphalt and concrete EC will extend a minimum of 24 inches deep and will be generally comprised of the following (from top to bottom):

1. Approximately 2 to 7 inches of asphalt or concrete pavement
2. Approximately 6 inches of crushed stone base
3. A high visibility demarcation layer (top of EC)
4. A minimum of 24 inches of clean fill to achieve grading requirements
5. A high visibility demarcation layer (bottom of EC)
6. Existing site soils

The EC will be composed of the layers between the two high visibility demarcation layers, allowing general maintenance to be completed on the overlying asphalt and/or concrete. The extent of the asphalt and concrete EC is shown on Figures 3 and 5 and details of the proposed asphalt and concrete EC are provided on Figure 6.

3.3 Clean Soil Cap EC Description

Natural grass landscaped areas are proposed at the slope between the existing athletic fields and the down-gradient recreational area, the existing landscaped areas to the west of the athletic fields, and the existing wooded areas to the north, south, and east of the athletic fields. Remedial excavations in these areas will be capped by clean imported fill and finished to grade with natural grass cover. The clean soil cap EC will render the remaining impacted soil with exceedances of the RDEC inaccessible and physically isolated from human contact in accordance with Section 22a-133k-2(f)(2)(C)(vii) of the RSRs.

The clean soil cap EC will extend a minimum of 24 inches deep and will be generally comprised of the following (from top to bottom):

1. Natural Grass Cover

2. Approximately 6 inches of clean imported topsoil
3. A high visibility demarcation layer (top of EC)
4. A minimum of 24 inches of clean fill to achieve grading requirements
5. A high visibility demarcation layer (bottom of EC)

The EC will be composed of the layers between the two high visibility demarcation layers, allowing general maintenance to be completed on the overlying natural grass. The extents of the clean soil cap EC is shown on Figures 3 and 5 and details of the proposed clean soil cap EC are provided on Figure 6.

3.4 Environmental Use Restriction

Following remedial excavation activities and placement of the proposed ECs, an EUR will be recorded for the Subject Property to prohibit actions that would expose the remaining impacted soil underlying the ECs in accordance with 22a-133k-2(f)(2)(c)(iii) of the CTDEEP RSRs. The EUR will be prepared in accordance with RCSA Section 22a-133q and the latest version of CTDEEPs "Environmental Land Use Restriction Guidance Document."

The restrictions to be established in the EUR will include:

1. No disturbance of inaccessible soil
2. No demolition of the asphalt and concrete walkways, driveways, and spectator areas, artificial turf field components, and natural grass landscaped areas which render underlying soil inaccessible because such soil poses an unacceptable risk to human health
3. No unauthorized disturbance of the engineered controls or underlying soil because such soil poses an unacceptable risk to human health

4.0 ENGINEERED CONTROL USE JUSTIFICATION

This EC Variance Request Part 1 is being submitted to request the use of ECs to prevent direct contact to and render inaccessible and physically isolated, polluted fill with exceedances of the RDEC throughout AOC-1 that will remain following remedial excavations. The proposed remedial approach includes site-wide excavation of impacted historic fill to depths of two feet bgs, deep excavation up to depths of nine feet bgs of highly impacted soil with PCB concentrations exceeding 10 mg/kg, the construction of ECs to render remaining impacted soil physically isolated, and placement of an EUR on the Subject Property and development of a monitoring and maintenance plan to prohibit disturbance of the ECs or remaining impacted soil and maintain the ECs indefinitely.

Multiple remedial alternatives have been evaluated to address polluted soil at the Subject Property including the proposed approach. Due to the nature of the contamination and its source (polluted historic fill), excavation, off-site disposal, and capping of the material was determined to be the most effective approach. Remedial excavation to the numerical criteria and three excavation and capping remedial alternatives were evaluated for their protection of human health and the environment, their compliance with regulations, long and short term effectiveness, reduction of toxicity, ability to implement, and cost effectiveness. A summary of the evaluation is provided as Table 1.

Based on the evaluation of remedial alternatives, the proposed remedial approach summarized above was determined to be the most cost effective based on the level of protection it provides to human health and the environment per dollar spent completing the remediation. This remedial approach meets the conditions necessary for the CTDEEP commissioner to approve the construction of the ECs in accordance with Section 22a-133k-2(f)(2)(A) of the RSRs as presented below:

- Cost of Remediation vs. Cost of Engineered Control – As summarized in Table 1, the cost of remediating to self-implementing procedures in accordance with Section 22a-133k-1(a)(39) of the RSRs would be approximately $9.1 million greater than the cost of the proposed remedial approach.
- Cost of Engineered Control vs. Potential Risk – The cost of remediating to self-implementing procedures in accordance with Section 22a-133k-1(a)(39) of the RSRs greatly outweighs the risk posed to human health and the environment should an engineered control fail to prevent exposure to the remaining polluted soils. The concentrations of contaminants proposed to remain below the ECs do not pose a short term risk; therefore, for a significant exposure to occur a disturbance to the ECs over a large area and for an extended period of time would be required. Any disturbance to the ECs would be prohibited by the placement of an EUR on the Subject Property and

potential failures of the ECs would be mitigated by implementation of a monitoring and maintenance plan. Physical isolation of the remaining polluted soils below the ECs poses negligible risk to human health and the environment.

5.0 POST REMEDIATION ACTIVITIES

5.1 EC Monitoring and Maintenance

The proposed ECs will be maintained indefinitely through implementation of an EUR that encompasses the limits of the EC area and a monitoring and maintenance plan for the ECs that will be submitted as a part of the EC Variance Request Part II. The EUR and monitoring and maintenance plan will require that the components of the proposed artificial turf fields, the asphalt and concrete pavement, and the clean soil cap within the EC area be maintained and undisturbed and the property owner assures the ECs are inspected and monitored regularly and repaired as needed. Regular inspection and monitoring events as well as regular maintenance will be documented and submitted to CTDEEP annually. Failure of the EC or unscheduled maintenance will be reported to the CTDEEP immediately. The overlying artificial turf fields, natural grass, and asphalt and concrete pavement are subject to normal wear and weather impacts. Repairs to surficial components of the ECs including the artificial turf, natural grass cover, and concrete and asphalt may be made. Disturbance of the materials below the artificial turf, natural grass cover, and concrete and asphalt will require approval by the CTDEEP in accordance with the EUR and monitoring and maintenance plan. The artificial turf field is expected to have a lifespan of approximately 30 years as a cover material and require minimal maintenance. However, the turf will likely be replaced more frequently for playability considerations.

5.2 Intended Future Use

The future use of the Subject Property will remain as it is currently used, as a public school and associated athletic fields and recreational area for use by the school and community. The area of the artificial turf EC will be maintained as athletic fields, the concrete and asphalt EC maintained as a driveways and walkways, and the clean soil cap EC maintained as a landscaped area.

TABLES

Table 1
Comparison of Remedial Alternatives
Western Middle School
Greenwich, Connecticut
Langan Project No.: 140148201

Evaluation Criteria	**Remediate to Numerical Criteria**	**Remedial Alternative #1**	**Remedial Alternative #2**	**Remedial Alternative #3**
	Remove all fill to underlying rock or native soil	Remove fill to 4 feet; plus remove PCBs >10ppm	Remove fill to 2 feet; plus remove PCBs >10ppm	Remove fill to 1 foot; plus remove PCBs >10ppm
Overall Protection of Human Health and the Environment	Yes	Yes, with site restrictions	Yes, with site restrictions	Yes, with site restrictions
Compliance with Applicable Regulations	Yes	Yes	Yes, with variances	Yes, with variances
Long-Term Effectiveness and Permanence	Yes; unlikely to require land use restrictions	Yes, with long-term cap inspection and maintenance	Yes, with long-term cap inspection and maintenance	Yes, with long-term cap inspection and maintenance
Reduction of Toxicity, Mobility, or Volume through Treatment	Greatest reduction	Significant reduction of risk for current uses	Significant reduction of risk for current uses	Significant reduction of risk for current uses
Short-Term Effectiveness	Least short-term effectiveness; anticipated to take **± 374 construction days**	Better effectiveness than alternative 1; but still anticipated to take **± 252 construction days**	Effective in the short-term; but still anticipated to take **± 144 construction days**	Most short-term effectiveness; anticipated to take **± 90 construction days**
Implementability	Least implementable	Implementable, but high trucking production rate is assumed	Implementable, but high trucking production rate is assumed	Most implementable
Cost-Effectiveness	**± 38.7 MIL**	**± 28.3 MIL**	**± 19.2 MIL**	**± 14.6 MIL**
State and Federal Acceptance	Probable acceptability	Probable acceptability	Probable acceptability with variances and consideration of public comments	Unlikely acceptability with variances and consideration of public comments
Community Acceptance (Construction impact on Community)	Very large community impact	Large community impacts	Less community impacts	Least community impacts

Description of Remedial Alternatives

Remediate to Numerical Criteria – Removal of all historic fill beneath the athletic fields to underlying rock or native soil.

Remedial Alternative 1 – Removal of fill beneath the athletic fields to a depth of 4 feet, plus the removal of PCBs in soil ≥10 mg/kg (regardless of depth).

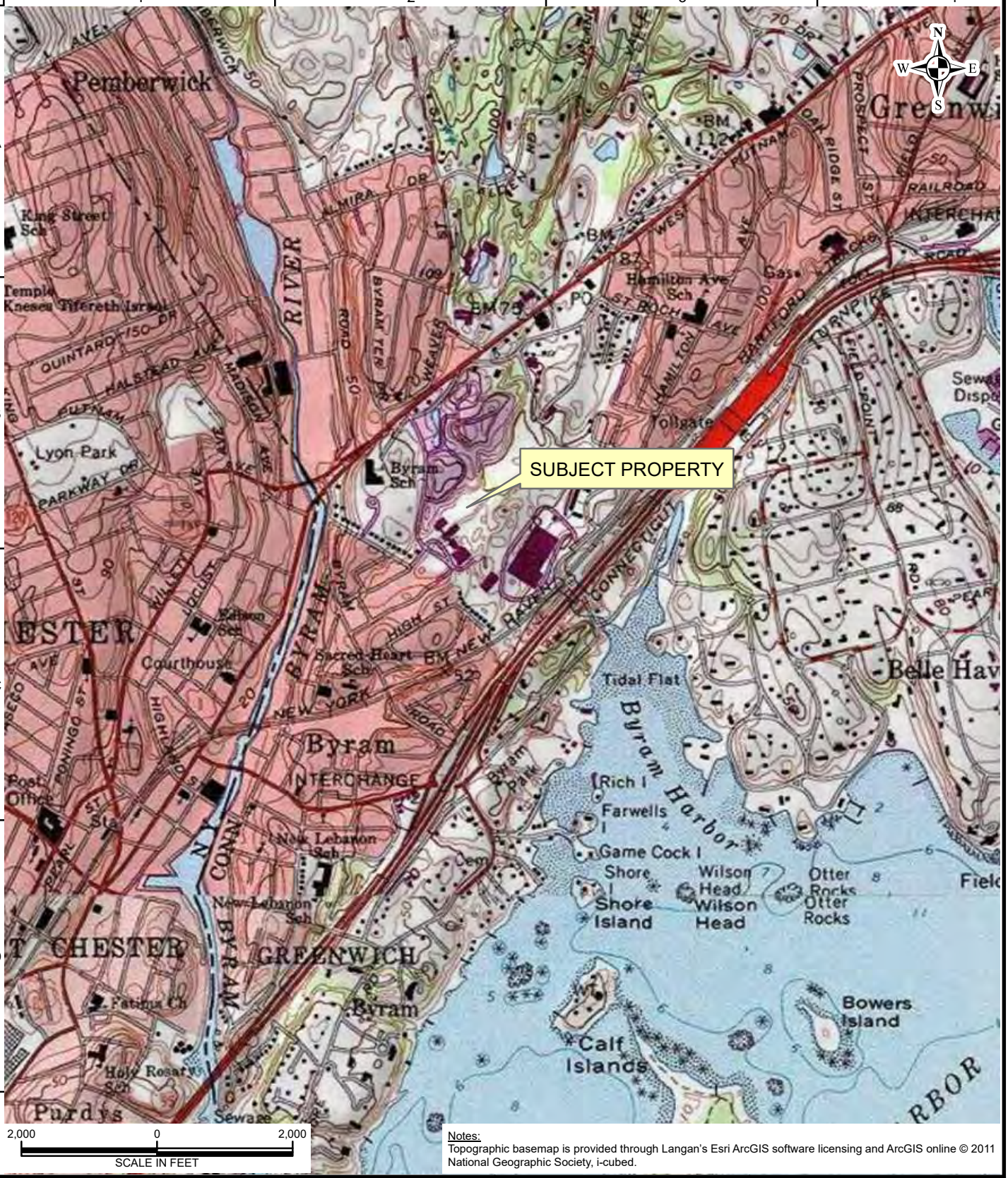
Remedial Alternative 2 – Removal of fill beneath the athletic fields to a depth of 2 feet, plus the removal of PCBs in soil ≥10 mg/kg (regardless of depth).

Remedial Alternative 3 – Removal of fill beneath the athletic fields to a depth of 1 foot, plus the removal of PCBs in soil ≥10 mg/kg (regardless of depth).

General Assumptions and Conditions

1. Cost estimate is based on Langan past experience and generalized vendor estimates.
2. Transportation and disposal pricing are subject to varying market conditions, and therefore, may be subject to cost increases at the time that work is to be conducted.
3. Transportation and disposal pricing will be further refined following the completion of waste chracterization sampling.
4. Changes in cost elements are likely to occur as a result of new information and data to be collected during engineering design and any potential pre-remedial supplemental investigations. Prior to and during remediation, there will likely be changes in the unit rates and costs for services, labor, materials and equipment that will lead to changes in the final cost of the project. Additional changes in costs may result from changes in quantities and unknowns that may be encountered during remediation.

FIGURES



Notes:
Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2011 National Geographic Society, i-cubed.

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PENNSYLVANIA CONNECTICUT FLORIDA

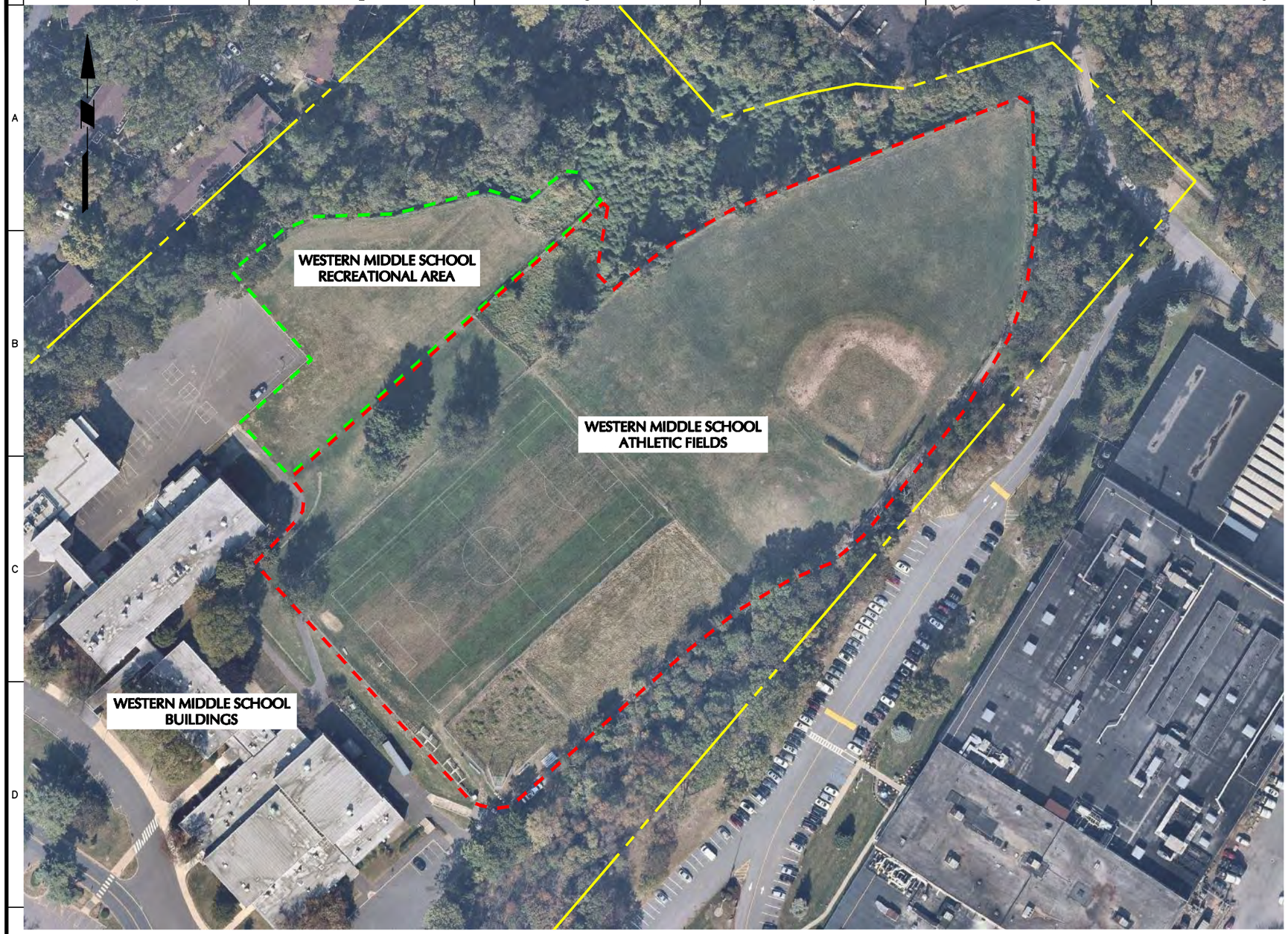
ABU DHABI ATHENS DOHA
DUBAI ISTANBUL

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SITE LOCATION MAP

Project No. 140148201	Figure 1
Date JANUARY 2022	
Scale 1" = 2,000'	
Drawn By JPH	
Submission Date JANUARY 2022	Sheet 1 of 6

Path: \\langan.com\data\NH\data2\140148201\ArcGIS\ArcMap_Documents\Figure 1 USGS Site Location Map.mxd Date: 1/11/2022 User: jhall Time: 11:13:43 PM



LEGEND

- PROPERTY BOUNDARY
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS (AOC–1)
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA (AOC–2)

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.

120 0 40 80 120
SCALE IN FEET

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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SITE PLAN AND EXISTING CONDITIONS MAP

Project No. 140148201	Drawing No. 2
Date JUNE 2022	
Scale 1"=120'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 2 of 6

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 1401482011\2D-DesignFiles\140131911 - HHRA Evaluation Areas.dwg Date: 6/29/2022 Time: 05:01 User: jhall Style Table: Langan.stb Layout: SITE PLAN

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE ARTIFICIAL TURF ENGINEERED CONTROL LOCATIONS
- APPROXIMATE ASPHALT AND CONCRETE ENGINEERED CONTROL LOCATIONS
- APPROXIMATE CLEAN SOIL CAP ENGINEERED CONTROL LOCATIONS

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON–WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. EC LOCATIONS ARE BASED ON PRELIMINARY DESIGN PLANS FOR THE WESTERN MIDDLE SCHOOL ATHLETIC FIELDS REDEVELOPMENT PROVIDED BY LANGAN.
3. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
4. PCB = POLYCHLORINATED BIPHENYLS
5. MG/KG = MILLIGRAMS PER KILOGRAM
6. BGS = BELOW GROUND SURFACE
7. EC = ENGINEERED CONTROL

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SCALE IN FEET

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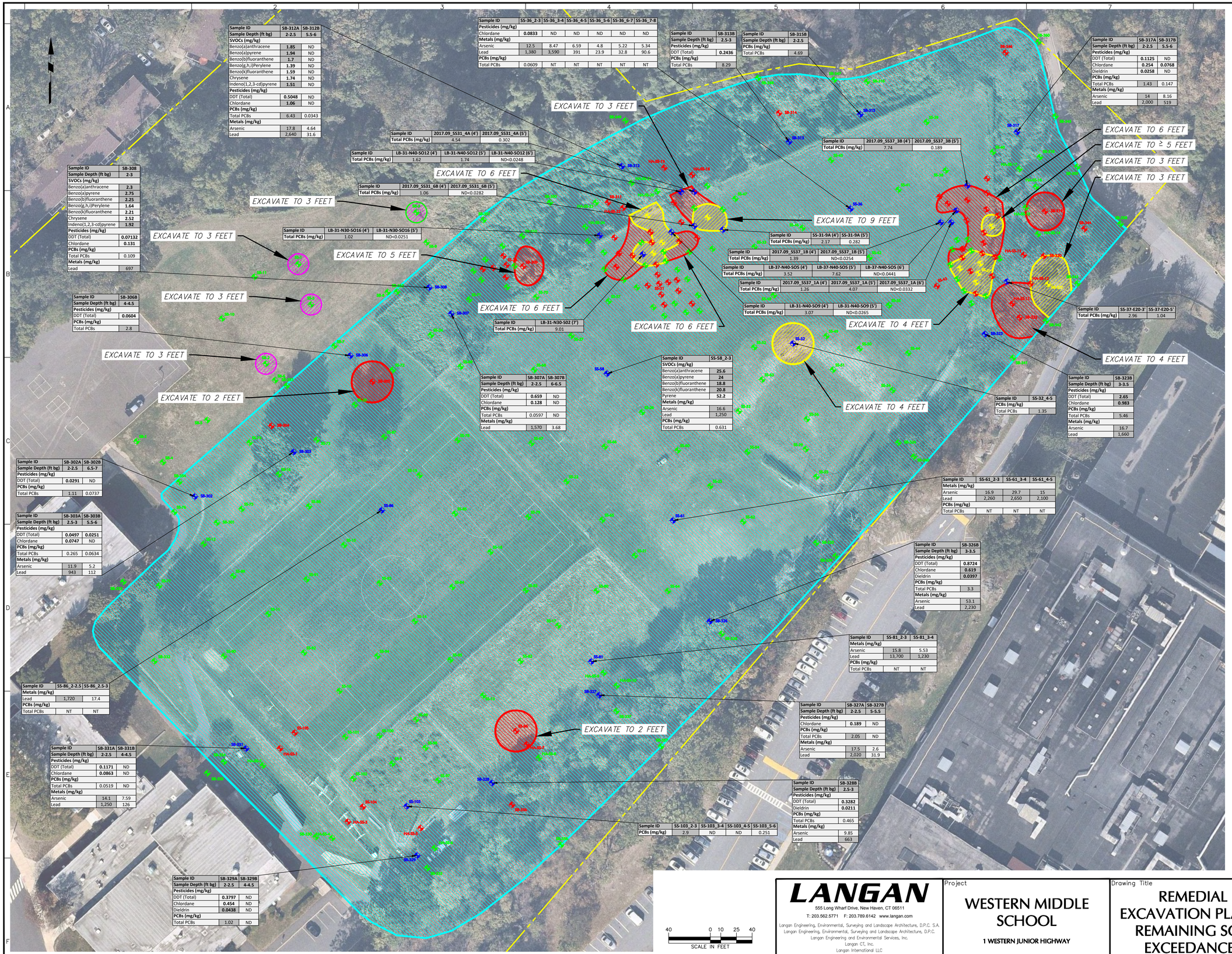
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
ENGINEERED CONTROL LOCATIONS PLAN

Project No. 140148201	Drawing No. 3
Date JUNE 2022	
Scale 1"=120'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 3 of 6

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140131911 - HHRA Evaluation Areas.dwg Date: 6/29/2022 Time: 05:02 User: jhall Style Table: Langan.stb Layout: EC LOCATIONS



LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- APPROXIMATE AREA TO BE EXCAVATED TO 2 FEET
- ESTIMATED EXCAVATION AREA OF PCBs > 50 MG/KG (EXCAVATION DEPTHS RANGE FROM 3 TO 9 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- ESTIMATED EXCAVATION AREA OF PCBs > 10 MG/KG (EXCAVATION DEPTHS RANGE FROM 2 TO 6 FEET) (20% CONTINGENCY ADDED IN THE AREA AND VOLUME TABLE)
- AOC–2 ARSENIC IMPACTED SOIL REMEDIAL EXCAVATION AREAS (AREAS TO BE EXCAVATED TO APPROXIMATELY 3 FEET BGS)
- AOC–2 ARSENIC AND PESTICIDE IMPACTED SOIL REMEDIAL EXCAVATION AREA (AREA TO BE EXCAVATED TO APPROXIMATELY 3 FEET BGS)

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
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2. THE PROPOSED REMEDIAL APPROACH FOR AOC–2 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF ARSENIC AND PESTICIDE IMPACTED SOIL BENEATH THE RECREATIONAL AREA TO A DEPTH OF 3 FEET.
3. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
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10. LBS = POUNDS
11. SF = SQUARE FEET
12. PPM = PARTS PER MILLION
13. EC = ENGINEERED CONTROL

Summary of Estimated Quantities - Remedial Alternative 2 -

Excavation Volume (CY)	PCBs < 50 mg/kg	32,855
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) (1.7 tons per CY)		57,926
# of Days Required for Excavation		108
# of Days Required for Backfill		36
Total # of Days Required for Construction		144
Approximate Cost		±$19.2 MIL

Remedial Summary	Remedial Excavation Area (sf)	Remedial Excavation Volume (cy)	Remedial Excavation Weight (tons)	Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
Sitewide Excavation of 2 feet	420,169	31,124	52,910	34,074	57,926
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
Excavations with PCBs > 10 PPM	11,075	1,731	2,943		

Compounds to Remain in Place Under Engineered Controls

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	Concentrations Above Criteria to Remain in Place
SVOCs	mg/kg	mg/kg	mg/kg
Benzo(a)anthracene	1	1	1.85 to 25.6
Benzo(a)pyrene	1	1	1.94 to 24
Benzo(b)fluoranthene	1	1	1.7 to 18.8
Benzo(g,h,i)Perylene	8.4	1	1.39 to 1.64
Benzo(k)fluoranthene	8.4	1	1.59 to 20.8
Chrysene	84	1	1.74 to 2.52
Indeno(1,2,3-cd)pyrene	1	1	1.51 to 1.92
Pyrene	1,000	40	52.2
Pesticides	mg/kg	mg/kg	mg/kg
Chlordane	0.49	0.066	0.0747 to 1.06
Dieldrin	0.038	0.007	0.0211 to 0.0438
DDT (Total)	1.8	0.02	0.0251 to 2.65
Metals	mg/kg	mg/L	mg/L
Arsenic	10	~	11.9 to 53.1
Lead	400	~	519 to 13,700
PCBs	mg/kg	mg/L	mg/L
Total PCBs	1	~	1.02 to 9.01

Bold indicates an exceedance of the Pollutant Mobility Criteria

Shaded indicates an exceedance of the Residential Direct Exposure Criteria

SCALE IN FEET: 40 0 10 25 40

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Collectively known as Langan

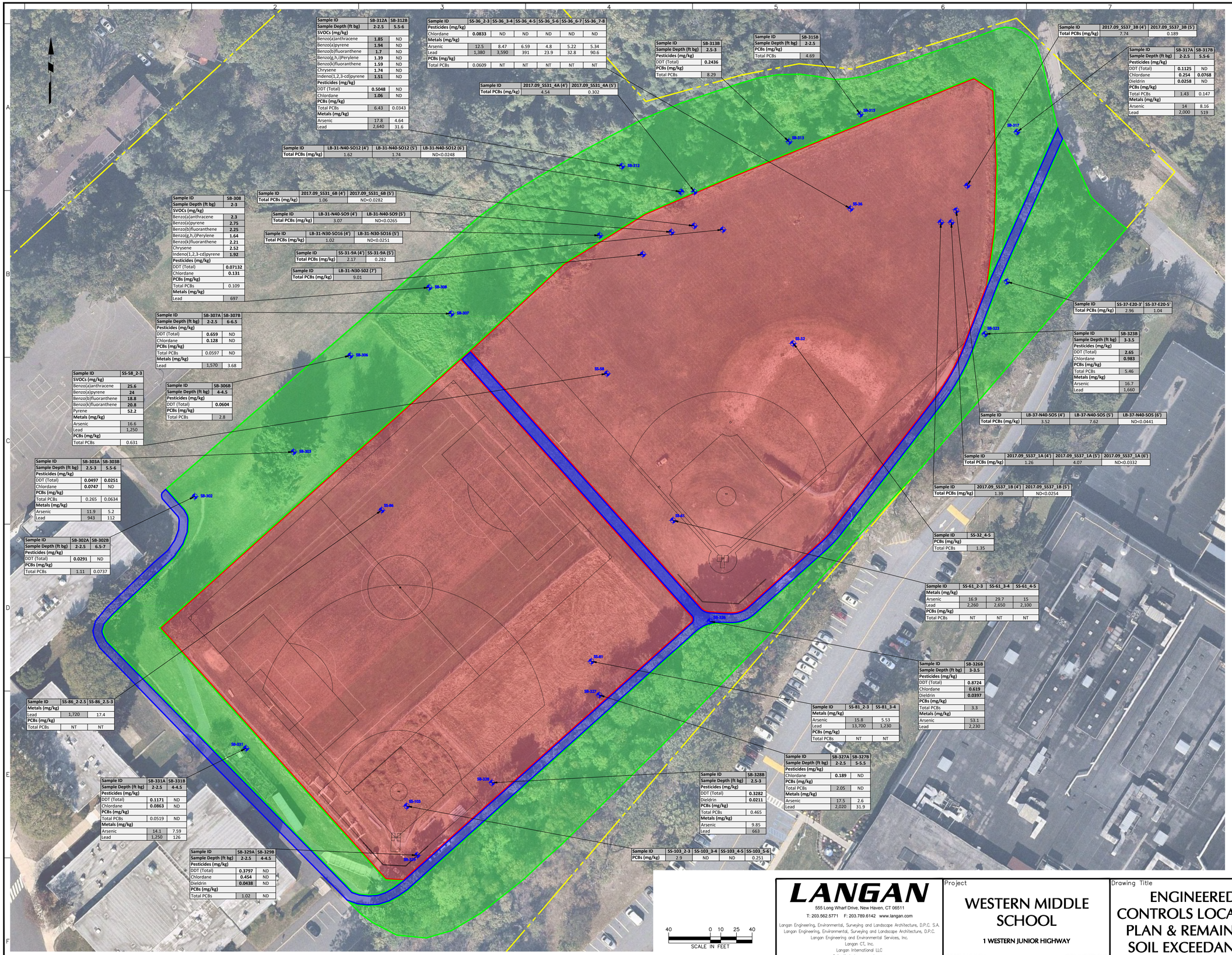
Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: REMEDIAL EXCAVATION PLAN & REMAINING SOIL EXCEEDANCES

Project No. 140148201	Drawing No. 4
Date JUNE 2022	
Scale 1" = 40'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 4 of 6

LANGAN
PROJECT NO. 140148201
SUBMISSION DATE: JUNE 2022

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/29/2022 Time: 05:04 User: jhall Style Table: Langan.stb Layout: Fig 7 - RA-2 Exc Plan



LEGEND

- SOIL BORING LOCATIONS KNOWN TO CONTAIN PCBs > 1 MG/KG OR OTHER COMPOUNDS OVER APPLICABLE CRITERIA TO REMAIN IN PLACE FOLLOWING EXCAVATION
- PROPERTY BOUNDARY
- PROPOSED ARTIFICIAL TURF ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED ASPHALT AND CONCRETE ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED CLEAN SOIL CAP ENGINEERED CONTROL APPROXIMATE LOCATIONS

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
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Summary of Estimated Quantities - Remedial Alternative 2 -		
Excavation Volume (CY)	PCBs < 50 mg/kg	32,855
	PCBs ≥ 50 mg/kg	1,219
Excavation Total (tons) [1.7 tons per CY]		57,926
# of Days Required for Excavation		108
# of Days Required for Backfill		36
Total # of Days Required for Construction		144
Approximate Cost		±$19.2 MIL

Remedial Summary	Remedial Excavation			Total Volume of Remedial Excavation (cy)	Total Weight of Remedial Excavation (tons)
	Area (sf)	Volume (cy)	Weight (tons)		
Sitewide Excavation of 2 feet	420,169	31,124	52,910	34,074	57,926
Excavations with PCBs > 50 PPM	6,909	1,219	2,072		
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Benzo(b)fluoranthene	1	1	1.7 to 18.8
Benzo(g,h,i)Perylene	8.4	1	1.39 to 1.64
Benzo(k)fluoranthene	8.4	1	1.59 to 20.8
Chrysene	84	1	1.74 to 2.52
Indeno(1,2,3-cd)pyrene	1	1	1.51 to 1.92
Pyrene	1,000	40	52.2
Pesticides	mg/kg	mg/kg	mg/kg
Chlordane	0.49	0.066	0.0747 to 1.06
Dieldrin	0.038	0.007	0.0211 to 0.0438
DDT (Total)	1.8	0.02	0.0251 to 2.65
Metals	mg/kg	mg/L	mg/L
Arsenic	10	~	11.9 to 53.1
Lead	400	~	519 to 13,700
PCBs	mg/kg	mg/L	mg/L
Total PCBs	1	~	1.02 to 9.01

Bold indicates an exceedance of the Pollutant Mobility Criteria

Shaded indicates an exceedance of the Residential Direct Exposure Criteria

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Collectively known as Langan

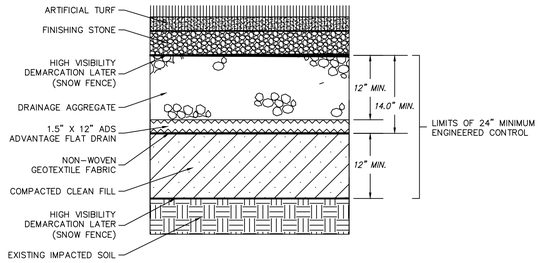
Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: ENGINEERED CONTROLS LOCATION PLAN & REMAINING SOIL EXCEEDANCES

Project No. 140148201	Drawing No. 5
Date JANUARY 2022	
Scale 1" = 40'	
Drawn By JPH / Checked By RJW	
Submission Date JANUARY 2022	Sheet 5 of 6

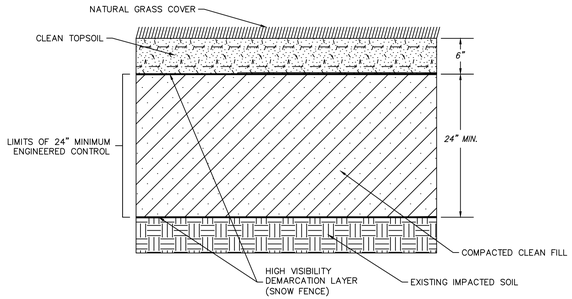
LANGAN
SUBMISSION DATE: JUNE 2022
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data7\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/29/2022 Time: 05:08 User: jhall Style Table: Langan.stb Layout: Fig 8 - RA-2 EC Loc



1 ARTIFICIAL TURF FIELD
N.T.S

ARTIFICIAL TURF ENGINEERED CONTROL CROSS SECTION



1 LANDSCAPED AREAS
N.T.S

CLEAN SOIL CAP ENGINEERED CONTROL CROSS SECTION

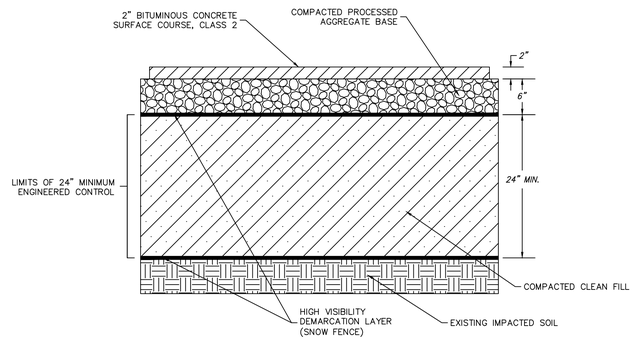
ENGINEERED CONTROLS LOCATION PLAN
SCALE: 1"=80'

LEGEND

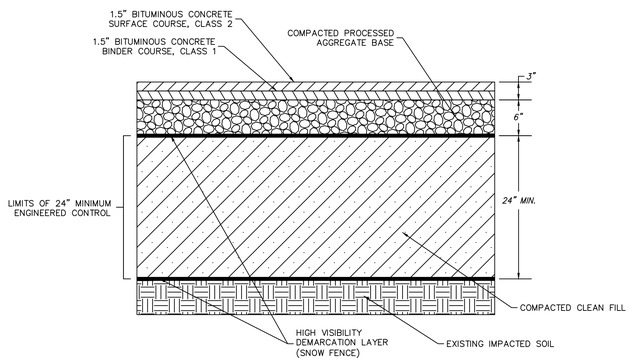
- PROPERTY BOUNDARY
- PROPOSED ARTIFICIAL TURF ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED ASPHALT AND CONCRETE ENGINEERED CONTROL APPROXIMATE LOCATIONS
- PROPOSED CLEAN SOIL CAP ENGINEERED CONTROL APPROXIMATE LOCATIONS

NOTES

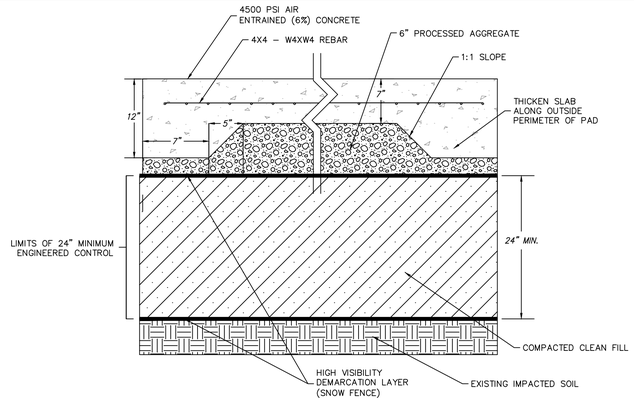
1. THE PROPOSED REMEDIAL APPROACH FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON-WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. THE PROPOSED REMEDIAL APPROACH FOR AOC-2 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF ARSENIC AND PESTICIDE IMPACTED SOIL BENEATH THE RECREATIONAL AREA TO A DEPTH OF 3 FEET.
3. EC LOCATIONS ARE BASED ON PRELIMINARY DESIGN PLANS FOR THE WESTERN MIDDLE SCHOOL ATHLETIC FIELDS REDEVELOPMENT PROVIDED BY LANGAN.
4. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
5. PCB = POLYCHLORINATED BIPHENYLS
6. VOC = VOLATILE ORGANIC COMPOUNDS
7. SVOC = SEMIVOLATILE ORGANIC COMPOUNDS
8. MG/KG = MILLIGRAMS PER KILOGRAM
9. BGS = BELOW GROUND SURFACE
10. CY = CUBIC YARDS
11. LBS = POUNDS
12. SF = SQUARE FEET
13. PPM = PARTS PER MILLION
14. EC = ENGINEERED CONTROL



1 BITUMINOUS CONCRETE SIDEWALK
N.T.S



2 BITUMINOUS CONCRETE PAVEMENT
N.T.S



3 CONCRETE PAD FOR BLEACHERS
N.T.S

ASPHALT AND CONCRETE ENGINEERED CONTROL CROSS SECTIONS

LANGAN
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Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
ENGINEERED CONTROLS CROSS SECTIONS

Project No. 140148201	Drawing No. 6
Date JUNE 2022	
Scale NTS	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 6 of 6

LANGAN
SUBMISSION DATE: JANUARY 2022
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Remedial Alternative_2022.06.dwg Date: 6/29/2022 Time: 05:08 User: jhall Style Table: Langan.stb Layout: Fig 9 - EC Cross Sec

APPENDIX A

Historical Environmental Reports
(Available Upon Request)

LANGAN

APPENDIX B

Historical Soil & Groundwater Analytical Results Summary Tables

LANGAN

Historical Soil & Groundwater Analytical Results Summary Tables

Table 1A
June 2016 Phase II ESI Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID **Sampling Depth (feet)** **Sampling Date**	**Residential Direct Exposure Criteria**	**GB Pollutant Mobility Criteria**	**SB-1** **2-2.5** **6/9/2016**	**SB-2** **2-2.5** **6/9/2016**	**SB-3** **2-2.5** **6/9/2016**	**SB-3 (DUP-1)** **2-2.5** **6/9/2016**
Volatile Organics, CT RCP List (mg/kg)	~	~	ND<Varies	ND<Varies	ND<Varies	ND<Varies
SVOCs by 8270 (mg/kg)						
Carbazole*	31	1	ND<0.535	0.640	ND<0.581	ND<0.583
Chrysene*	84	1	ND<0.535	0.552	ND<0.581	ND<0.583
Fluoranthene	1,000	56	ND<0.535	1.130	1.000	0.721
Phenanthrene	1,000	40	ND<0.535	0.723	0.592	ND<0.583
Pyrene	1,000	40	ND<0.535	1.030	0.893	0.634
Herbicides, CT RCP (mg/kg)	~	~	ND<Varies	ND<Varies	ND<Varies	ND<Varies
Pesticides, CT RCP Target List (mg/kg)						
4,4-DDE*	1.8	0.02	ND<0.00267	ND<0.00275	ND<0.00290	0.0183
4,4'-DDT*	1.8	0.02	0.00347	ND<0.00275	ND<0.00290	0.0204
Chlordane, total	0.49	0.066	ND<0.0106	ND<0.0109	ND<0.0115	0.218
Heptachlor epoxide	0.067	0.02	ND<0.00267	ND<0.00275	ND<0.00290	0.00584
Polychlorinated Biphenyls (PCB RCP) (mg/kg)						
Total PCBs	1	NE	ND<0.0267	0.275	0.0533	0.104
Extractable Total Petroleum Hydrocarbons (ETPH) (mg/kg)						
ETPH	500	2,500	11.3	ND<11.0	116	112
Metals, CTDEP RCP (mg/kg)						
Antimony	27	NE	0.54	0.55	0.58	0.58
Arsenic	10	NE	4.73	**29.30**	**18.6**	**16.2**
Barium	4,700	NE	198	649	256	215
Beryllium	2	NE	ND<0.107	0.296	ND<0.116	ND<0.117
Cadmium	34	NE	0.471	0.679	0.962	0.895
Chromium	NE	NE	89.2	50.5	36.7	34.7
Copper	2,500	NE	35.8	52.0	48.5	46.7
Lead	400	NE	25.5	27.0	128	117
Nickel	1,400	NE	43.7	30.9	20.9	19.9
Selenium	340	NE	3.43	5.62	3.46	2.63
Silver	340	NE	0.54	0.55	0.58	0.58
Thallium	5.4	NE	1.07	1.10	1.16	1.17
Vanadium	470	NE	61.1	46.5	39.1	32.3
Zinc	20,000	NE	64.2	437	373	273
Mercury by 7473 (mg/kg)						
Mercury	20	NE	ND<0.0321	ND<0.0330	0.144	0.168

NOTES:
ND = Not detected above laboratory reporting limits
NE = Not established
"~" = Criteria varies based on compound

Bold indicates an exceedance of the Residential Direct Exposure Criteria
Shading indicates an exceedence of the GB Pollutant Mobility Criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 1B
June 2016 Phase II ESI Shallow Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Parameters	Residential Direct Exposure Criteria	SS-1 0 to 6 inches 6/9/2016	SS-2 0 to 6 inches 6/9/2016	SS-3 0 to 6 inches 6/9/2016	SS-4 0 to 6 inches 6/9/2016	SS-5 0 to 6 inches 6/9/2016	SS-6 0 to 6 inches 6/9/2016	SS-7 0 to 6 inches 6/9/2016	SS-8 0 to 6 inches 6/9/2016
Metals, CTDEP RCP (mg/kg)									
Antimony	27	0.64	0.69	0.57	0.57	0.56	0.55	0.59	0.58
Arsenic	10	**11.6**	7.79	2.95	3.15	**37.0**	2.36	7.79	7.01
Barium	4,700	228	189	149	156	445	83.0	283	182
Beryllium	2	0.13	0.14	0.11	0.11	0.11	0.11	0.12	0.12
Cadmium	34	1.29	0.844	0.371	0.406	0.891	ND<0.331	1.23	0.474
Chromium	4,000	121	60.3	32.4	45.0	26.2	19.1	104	36.4
Copper	2,500	59.1	45.3	36.0	36.3	40.9	20.4	61.2	89.0
Lead	400	75.8	91.2	21.1	19.2	46.5	22.4	63.5	81.0
Nickel	1,400	62.6	33.3	21.4	28.2	17.1	15.5	51.5	31.2
Selenium	340	2.73	3.14	3.14	3.26	4.19	1.92	3.18	2.86
Vanadium	470	47.6	50.3	43.0	45.4	35.9	28.8	65.5	43.9
Zinc	20,000	157	146	72.2	76.9	477	51.0	147	130
Mercury by 7473 (mg/kg)									
Mercury	20	0.104	0.115	0.0844	0.0504	0.0773	0.109	0.102	0.0880

NOTES:
ND = Not detected above laboratory reporting limits
NE = Not established
"~" = Criteria varies based on compound

Bold indicates an exceedance of the Residential Direct Exposure Criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-9 7/27/2016	SS-10 7/27/2016	SS-11 7/27/2016	SS-12 7/27/2016	SS-13 7/27/2016	SS-14 7/27/2016	SS-14 (DUP-1) 7/27/2016	SS-15 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
2,4-Dinitrotoluene	0.9*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
2,6-Dinitrotoluene	0.9*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
4-Chloroaniline	3.1*	31*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Benzo(a)anthracene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Benzo(a)pyrene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Benzo(b)fluoranthene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Bis(2-chloroethyl)ether	1	2.4	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Dibenzofuran	1.4*	1.4*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Fluoranthene	1,000	56	ND<0.518	ND<0.789	ND<0.746	0.67 D	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Hexachlorobenzene	1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594 IS-06	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Nitrobenzene	4*	1*	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.518	ND*<0.789	ND*<0.746	ND*<0.594	ND*<0.615	ND*<0.766	ND*<0.701	ND*<0.793
Pentachlorophenol	5.1	1	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0207	ND<0.0315	ND<0.0298	ND<0.0238	ND<0.0246	ND<0.0306	ND<0.028	ND<0.0317
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	ND<0.00259	ND<0.00394	ND<0.00373	ND<0.00297	ND<0.00308	ND<0.00383	ND<0.0035	ND<0.00396
Chlordane, total	0.49	0.066	***0.8 D***	***3.6 D***	***3.95 D***	ND<0.0118	***1.93 D***	***2.02 D***	***2.68 D***	***3.23 D***
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	ND<0.00259	ND<0.0394	ND<0.0373	0.298	ND<0.0308	ND<0.0383	ND<0.035	ND<0.0396
Aroclor 1260	NE	NE	ND<0.00259	ND<0.0394	0.279	0.179	ND<0.0308	0.0936	0.15	0.088
Aroclor 1262	NE	NE	ND<0.00259	ND<0.0394	ND<0.0373	ND<0.0297	ND<0.0308	ND<0.0383	ND<0.035	ND<0.0396
Total PCBs	1	NE	ND<0.00259	ND<0.0394	0.279	0.477	ND<0.0308	0.0936	0.15	0.088
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	ND<0.518	ND<0.789	ND<0.746	ND<0.594	ND<0.615	ND<0.766	ND<0.701	ND<0.793
Arsenic	10	NE	2.5	8.46	7.79	8.88	6.48	6.39	6.82	7.46
Barium	4,700	NE	50.6	166	211	206	119	187	189	205
Beryllium	2	NE	0.159	ND<0.158	0.164	ND<0.119	ND<0.123	0.178	0.147	0.161
Cadmium	34	NE	0.558	1.67	4.05	2.03	0.813	2.85	2.92	1.71
Chromium	4,000	NE	14.7	65.9	103	114	58.8	86.4	91.2	70.7
Copper	2,500	NE	15.1	43.1	137	109	32.3	50.8	50.8	44.5
Lead	400	NE	13.3	142	209	218	95.7	192	220	145
Mercury	20	NE	ND<0.0311	0.146	0.156	0.178	0.138	0.166	0.212	0.169
Nickel	1,400	NE	10.1	33.1	52.6	51.9	28.4	37.4	39.1	34.2
Selenium	340	NE	1.38	2.34	4.56	3.76	3.64	3.76	4.22	4.86
Vanadium	470	NE	19.7	52.8	56.4	62.3	51.1	55.7	59.2	56.3
Zinc	20,000	NE	33.8	186	271	214	109	244	219	197

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-16 7/27/2016	SS-17 7/27/2016	SS-18 7/27/2016	SS-19 7/27/2016	SS-20 7/27/2016	SS-21 7/27/2016	SS-22 7/27/2016	SS-23 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
2,4-Dinitrotoluene	0.9*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
2,6-Dinitrotoluene	0.9*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
4-Chloroaniline	3.1*	31*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Benzo(a)anthracene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Benzo(a)pyrene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Benzo(b)fluoranthene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Bis(2-chloroethyl)ether	1	2.4	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Dibenzofuran	1.4*	1.4*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Fluoranthene	1,000	56	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Hexachlorobenzene	1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Nitrobenzene	4*	1*	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.633	ND*<0.617	ND*<0.697	ND*<0.678	ND*<0.601	ND*<0.631	ND*<0.634	ND*<0.802
Pentachlorophenol	5.1	1	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	ND<0.802
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0253	ND<0.0247	ND<0.0279	ND<0.0271	ND<0.024	ND<0.0252	ND<0.0254	0.061
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	*0.0591 D*	ND<0.00308	ND<0.00348	ND<0.00339	ND<0.003	ND<0.00315	ND<0.00317	ND<0.00401
Chlordane, total	0.49	0.066	ND<0.0125	***2.31 D***	***1.74 D***	***3.16 D***	ND<0.0119	***0.985 D***	***6.76 D***	***5.48 D***
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	0.21	ND<0.0308	ND<0.0348	ND<0.0339	0.331	ND<0.0315	ND<0.0317	ND<0.0401
Aroclor 1260	NE	NE	0.213	0.0988	0.0536	ND<0.0339	0.199	ND<0.0315	ND<0.0317	ND<0.0401
Aroclor 1262	NE	NE	ND<0.0317	ND<0.0308	ND<0.0348	ND<0.0339	ND<0.03	0.199	ND<0.0317	ND<0.0401
Total PCBs	1	NE	0.424	0.0988	0.0536	ND<0.0339	0.529	0.199	ND<0.0317	ND<0.0401
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	ND<0.633	ND<0.617	ND<0.697	ND<0.678	ND<0.601	ND<0.631	ND<0.634	2.54
Arsenic	10	NE	7.17	5.8	6.82	8.8	8.8	4.54	3.65	6.26
Barium	4,700	NE	236	163	195	422	225	133	164	350
Beryllium	2	NE	ND<0.127	ND<0.123	ND<0.139	ND<0.136	ND<0.12	ND<0.126	ND<0.127	ND<0.16
Cadmium	34	NE	3.65	1.27	1.12	2.67	2.62	1.02	0.862	4.4
Chromium	4,000	NE	167	55.6	46.9	128	128	40.8	38.9	289
Copper	2,500	NE	98.6	54.2	35.2	131	78	66.2	48.8	155
Lead	400	NE	351	226	171	**478**	228	171	159	372
Mercury	20	NE	0.277	0.19	0.128	0.2	0.281	0.118	0.0988	0.228
Nickel	1,400	NE	62.3	28.7	22.4	87.2	58.7	31.4	22.2	94.3
Selenium	340	NE	7.5	4.47	2.64	4.54	4.64	4.18	4.44	3.02
Vanadium	470	NE	97.3	50.8	38.6	62.1	65.6	74.8	40.1	48.6
Zinc	20,000	NE	331	216	156	461	243	260	161	479

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID / Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-24 7/27/2016	SS-25 7/27/2016	SS-26 7/27/2016	SS-26 (DUP-2) 7/27/2016	SS-27 7/27/2016	SS-28 7/27/2016	SS-29 7/27/2016	SS-30 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
2,4-Dinitrotoluene	0.9*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
2,6-Dinitrotoluene	0.9*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
4-Chloroaniline	3.1*	31*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Benzo(a)anthracene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Benzo(a)pyrene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Benzo(b)fluoranthene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Bis(2-chloroethyl)ether	1	2.4	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Dibenzofuran	1.4*	1.4*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Fluoranthene	1,000	56	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Hexachlorobenzene	1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Nitrobenzene	4*	1*	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.673	ND*<0.595	ND*<0.554	ND*<0.555	ND*<0.596	ND*<0.696	ND*<0.627	ND*<0.716
Pentachlorophenol	5.1	1	ND<0.673	ND<0.595	ND<0.554	ND<0.555	ND<0.596	ND<0.696	ND<0.627	ND<0.716
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0269	ND<0.0238	ND<0.0222	ND<0.0222	ND<0.0238	ND<0.0279	ND<0.0251	ND<0.0286
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	*0.0607 D*	ND<0.00297	ND<0.00277	ND<0.00278	ND<0.00298	ND<0.00348	ND<0.00313	ND<0.00358
Chlordane, total	0.49	0.066	ND<0.0133	***0.741 D***	ND<0.011	*0.155 D*	***4.13 D***	ND<0.0138	*0.302 D*	***5.85 D***
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	0.29	ND<0.0297	0.0996	0.094	ND<0.0298	0.443	ND<0.0313	ND<0.0358
Aroclor 1260	NE	NE	0.241	0.0906	ND<0.0277	ND<0.0278	0.15	0.652	ND<0.0313	ND<0.0358
Aroclor 1262	NE	NE	ND<0.0337	ND<0.0297	ND<0.0277	ND<0.0278	ND<0.0298	ND<0.0348	ND<0.0313	ND<0.0358
Total PCBs	1	NE	0.531	0.0906	0.0996	0.094	0.15	**1.09**	ND<0.0313	ND<0.0358
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	7.62	ND<0.595	ND<0.554	ND<0.555	ND<0.596	3.31	ND<0.627	ND<0.716
Arsenic	10	NE	**13.4**	**10.2**	2.35	3.04	6.78	**12.2**	4.61	7.19
Barium	4,700	NE	874	267	80.3	64.7	157	808	85.2	196
Beryllium	2	NE	ND<0.135	ND<0.119	0.169	0.114	0.153	ND<0.139	0.165	0.293
Cadmium	34	NE	11.7	1.95	ND<0.332	ND<0.333	1.62	14.4	0.544	1.29
Chromium	4,000	NE	246	83.6	17.7	16.1	104	318	30.5	50.3
Copper	2,500	NE	340	120	19.9	20.5	74.7	265	32.3	102
Lead	400	NE	**1,640**	357	22.4	33.6	299	**1,190**	76.5	**423**
Mercury	20	NE	1.15	0.389	ND<0.0332	ND<0.0333	0.197	1.54	0.0797	0.155
Nickel	1,400	NE	108	49	15.9	14.8	125	120	19.7	61.1
Selenium	340	NE	7.53	4.46	1.34	2.9	3.04	6.35	3.46	4.7
Vanadium	470	NE	71.3	64.4	24.3	24.4	33.6	69.5	35.5	42.1
Zinc	20,000	NE	1,310	422	52.6	63.5	231	1,070	108	351

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 2
July 2016 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID / Sampling Date	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-31 7/27/2016	SS-32 7/27/2016	SS-33 7/27/2016	SS-34 7/27/2016	SS-35 7/27/2016	SS-36 7/27/2016	SS-37 7/27/2016	SS-38 7/27/2016
SVOCs by 8270 (mg/kg)										
1,2,4-Trichlorobenzene	21*	14*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
2,4-Dinitrotoluene	0.9*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
2,6-Dinitrotoluene	0.9*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
3,3'-Dichlorobenzidine	1.4*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
4-Chloroaniline	3.1*	31*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Benzo(a)anthracene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Benzo(a)pyrene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Benzo(b)fluoranthene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Bis(2-chloroethyl)ether	1	2.4	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Dibenzofuran	1.4*	1.4*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Fluoranthene	1,000	56	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Hexachlorobenzene	1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Indeno(1,2,3-cd)pyrene	1*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Nitrobenzene	4*	1*	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
N-nitroso-di-n-propylamine	0.2*	1*	ND*<0.645	ND*<0.526	ND*<0.63	ND*<0.564	ND*<0.65	ND*<0.64	ND*<0.632	ND*<0.619
Pentachlorophenol	5.1	1	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Herbicides, CT RCP (mg/kg)										
Dalapon	NE	NE	ND<0.0258	ND<0.0211	ND<0.0252	ND<0.0226	ND<0.026	ND<0.0256	ND<0.0253	ND<0.0248
Pesticides, CT RCP Target List (mg/kg)										
4,4'-DDT	0.09*	0.02*	*0.0565 D*	ND<0.00263	ND<0.00315	0.00519 D	ND<0.00325	ND<0.0032	ND<0.00316	ND<0.00309
Chlordane, total	0.49	0.066	***1.51 D***	ND<0.0104	***1.7 D***	ND<0.0112	ND<0.0129	***0.778 D***	ND<0.0125	ND<0.0123
Polychlorinated Biphenyls (PCB RCP) (mg/kg)										
Aroclor 1248	NE	NE	0.775	ND<0.0263	ND<0.0315	ND<0.0282	0.129	ND<0.032	4.19 D	0.359
Aroclor 1260	NE	NE	0.191	ND<0.0263	0.0519	ND<0.0282	0.108	0.0457	0.845 D	0.384
Aroclor 1262	NE	NE	ND<0.0322	ND<0.0263	ND<0.0315	ND<0.0282	ND<0.0325	ND<0.032	ND<0.316	ND<0.0309
Total PCBs	1	NE	0.965	ND<0.0263	0.0519	ND<0.0282	0.237	0.0457	**5.03 D**	0.742
Metals, CTDEEP RCP (mg/kg)										
Antimony	27	NE	ND<0.645	ND<0.526	ND<0.63	ND<0.564	ND<0.65	ND<0.64	ND<0.632	ND<0.619
Arsenic	10	NE	7.6	3.49	6.92	2.83	5.17	5.86	7.17	7.03
Barium	4,700	NE	250	65.4	168	75.1	125	128	205	240
Beryllium	2	NE	0.19	0.181	0.241	ND<0.113	0.25	ND<0.128	ND<0.126	0.336
Cadmium	34	NE	2.4	ND<0.316	1.06	ND<0.338	3.87	0.633	2.69	2.03
Chromium	4,000	NE	98.1	12.1	69.7	15.4	142	72.2	84.9	85.5
Copper	2,500	NE	114	15.6	91.3	15.7	49.7	37.5	97.7	119
Lead	400	NE	**412**	7.74	253	17.3	168	110	244	303
Mercury	20	NE	0.281	ND<0.0316	0.139	ND<0.0338	0.21	0.137	0.129	0.433
Nickel	1,400	NE	109	11.4	80.8	10.2	187	108	50.4	127
Selenium	340	NE	4.29	1.94	3.63	ND<1.13	3.25	3.15	3.15	4.42
Vanadium	470	NE	52.7	20.8	42	14.7	54.5	35.9	58	35.1
Zinc	20,000	NE	363	28.6	243	46.4	168	122	388	395

Notes:
D = Result is from an analysis that required a dilution.
IS-06 = Internal standard perylene-d12 did not meet acceptance criteria. The sample was reanalyzed to confirm matrix interference. Compounds affected are: Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene.
ND = NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL).
ND* = Reporting limit above RSR criteria.
NE = Not established

Bold indicates an exceedance of the RDEC
Italics indicates an exceedance of the GBPMC

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs effective 30 January 1996 and/or 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 8 March 2016) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 3A
October 2016 Chlordane Delineation Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-9S-10 0 - 3 10/7/2016	SS-9N-10 0 - 3 10/7/2016	SS-9W-10 0 - 3 10/7/2016	SS-9E-10 0 - 3 10/7/2016
Pesticides, CT RCP Target List (mg/kg)					
Chlordane, total	0.49	ND<0.033	ND<0.033	0.0369	ND<0.033

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-22S-10 0 - 3 10/7/2016	SS-22N-10 0 - 3 10/7/2016	SS-22W-10 0 - 3 10/7/2016	SS-22E-10 0 - 3 10/7/2016	SS-DUP_10.7.16 0 - 3 10/7/2016
Pesticides, CT RCP Target List (mg/kg)						
Chlordane, total	0.49	ND<0.033	ND<0.033	ND<0.033	ND<0.033	ND<0.033

Notes:
1. Langan utilized the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) Residential Direct Exposure Criteria (RDEC) as a screening level criterion to identify driver compounds that may require additional assessment.
2. ND = Not detected above laboratory reporting limits.
3. mg/kg = milligram per kilogram

Table 3B
August and Ocotober 2016 Lead Delineation Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	Site-Specific Action Level	SS-24N-10 0 - 3 8/9/2016	SS-24E-10 0 - 3 8/9/2016	SS-24S-10 0 - 3 8/9/2016	SS-24W-10 0 - 3 8/9/2016	SS-24N-20 0 - 3 8/9/2016	SS-24E-20 0 - 3 8/9/2016	SS-24S-20 0 - 3 8/9/2016	SS-24W-20 0 - 3 8/9/2016
Lead by EPA 6010 (mg/kg)										
Lead	400	606	**449**	**721**	**1,390**	**470**	252	**537**	**542**	**413**

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	Site-Specific Action Level	SS-28N-10 0 - 3 8/9/2016	SS-28E-10 0 - 3 8/9/2016	SS-28S-10 0 - 3 8/9/2016	SS-28W-10 0 - 3 8/9/2016	SS-28N-20 0 - 3 8/9/2016	SS-28W-20 0 - 3 8/9/2016
Lead by EPA 6010 (mg/kg)								
Lead	400	606	**706**	340	288	**850**	259	**739**

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	Site-Specific Action Level	SS-28W-30 0 - 3 10/7/2016	SS-28W-40 0 - 3 10/7/2016	SS-28W20-NW10 0 - 3 10/7/2016	SS-28W20-N10 0 - 3 10/7/2016	SS-28W20-SW10 0 - 3 10/7/2016	SS-28W20-S10 0 - 3 10/7/2016	SS-28W20-S20 0 - 3 10/7/2016
Lead by EPA 6010 (mg/kg)									
Lead	400	606	345	293	361	**467**	**703**	**476**	295

Notes:

1. Langan utilized the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) Residential Direct Exposure Criteria (RDEC) as a screening level criterion to identify driver compounds that may require additional assessment. As part of Langan's Human Health Risk Assesment (HHRA), an action level of 606 mg/kg was calculated for lead in soil in accordance with the United States Environmental Protection Agency's (USEPA) Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead in children. This remediation action level for lead was approved by the Connecticut Department of Public Health (DPH).
2. Soil samples highlighted in yellow represent the outermost delineation samples that are used to define the areas of the Subject Property slated for remedial excavation to 1 foot below ground surface (bgs).
3. Bold indicates an exceedance of the RDEC.
4. Shading indicates an exceedance of the site-specific action level.
5. mg/kg = milligram per kilogram

Table 3C
October 2016 Recreational Area Soil Analytical Results
Western Middle School
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-39-3 0 - 3 10/5/2016	SS-39-12 12 10/5/2016	SS-40-3 0 - 3 10/5/2016	SS-40-12 12 10/5/2016	SS-41-3 0 - 3 10/5/2016	SS-41-12 12 10/5/2016	DUP (SS-41-12) 12 10/5/2016	SS-42-3 0 - 3 10/5/2016	SS-42-12 12 10/5/2016
Pesticides (mg/kg)										
Chlordane, total	0.49	ND<0.0588	NA	0.326 D	NA	ND<0.0577	NA	NA	ND<0.0569	NA
PCBs (mg/kg)										
Aroclor 1254	NE	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274
Total PCBs	1	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SS-43-3 0 - 3 10/5/2016	SS-43-12 12 10/5/2016	SS-44-3 0 - 3 10/5/2016	SS-44-12 12 10/5/2016	SS-45-3 0 - 3 10/5/2016	SS-45-12 12 10/5/2016	SS-46-3 0 - 3 10/5/2016	SS-46-12 12 10/5/2016
Pesticides (mg/kg)									
Chlordane, total	0.49	ND<0.06	NA	ND<0.0565	NA	ND<0.0577	NA	ND<0.0565	NA
PCBs (mg/kg)									
Aroclor 1254	NE	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162
Total PCBs	1	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162

Notes:
1. Langan utilized the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) Residential Direct Exposure Criteria (RDEC) as a screening level criterion to identify driver compounds that may require additional assessment.
2. Only pesticides and PCBs with detections are shown on this table.
3. D = Result is from an analysis that required a dilution.
4. ND = Not detected above laboratory reporting limits.
5. NE = Criteria not established for this compound.
6. mg/kg = milligram per kilogram

Table 3D
October 2016 Recreational Area Soil Analytical Results
Western Middle School
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SB-4 (3") 0 - 3 10/5/2016	SB-4 (1') 12 10/5/2016	SB-5 (3") 0 - 3 10/5/2016	SB-5 (1') 12 10/5/2016	SB-6 (3") 0 - 3 10/5/2016	SB-6 (1') 12 10/5/2016	DUP (SB-6 (1')) 12 10/5/2016	SB-7 (3") 0 - 3 10/5/2016	SB-7 (1') 12 10/5/2016
Pesticides (mg/kg)										
Chlordane, total	0.49	ND<0.0588	NA	0.326 D	NA	ND<0.0577	NA	NA	ND<0.0569	NA
PCBs (mg/kg)										
Aroclor 1254	NE	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274
Total PCBs	1	ND<0.0294	ND<0.0272	ND<0.0269	ND<0.0273	ND<0.0289	ND<0.0285	ND<0.0279	ND<0.0285	ND<0.0274

Sample ID Sample Depth (inches) Sampling Date	Residential Direct Exposure Criteria	SB-8 (3") 0 - 3 10/5/2016	SB-8 (1') 12 10/5/2016	SB-9 (3") 0 - 3 10/5/2016	SB-9 (1') 12 10/5/2016	SB-10 (3") 0 - 3 10/5/2016	SB-10 (1') 12 10/5/2016	SB-11 (3") 0 - 3 10/5/2016	SB-11 (1') 12 10/5/2016
Pesticides (mg/kg)									
Chlordane, total	0.49	ND<0.06	NA	ND<0.0565	NA	ND<0.0577	NA	ND<0.0565	NA
PCBs (mg/kg)									
Aroclor 1254	NE	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162
Total PCBs	1	ND<0.03	ND<0.0271	ND<0.0283	ND<0.0278	ND<0.0288	ND<0.0265	ND<0.0283	0.162

NOTES:
D = Result is from an analysis that required a dilution
ND = Not detected above laboratory reporting limits
NE = Not established

1. Only pesticide and PCB detections are shown on this table

Table 4A
October 2016 to 2017 SS-28 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	SS-28 7/27/2016 3"	SS-28-1' 10/18/2016 1'	SS-28-2' 10/18/2016 2'	SS-28-W10-3" 10/18/2016 3"	SS-28-W10-2' 10/18/2016 2'	SS-28-W20-3" 10/18/2016 3"	SS-28-W20-2' 10/18/2016 2'
PCBs (mg/kg)								
Aroclor 1016	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1221	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1232	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1242	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1248	NE	0.443	0.506	ND<0.0271	ND<0.596	ND<0.0265	0.812	0.0632
Aroclor 1254	NE	ND<0.0348	0.573	0.125	10.3 D	0.0586	1.51	0.0977
Aroclor 1260	NE	0.652	ND<0.0307	0.0623	ND<0.596	ND<0.0265	0.737	0.0617
Aroclor 1262	NE	ND<0.0348	ND<0.0307	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Aroclor 1268	NE	ND<0.0348	0.1	ND<0.0271	ND<0.596	ND<0.0265	ND<0.0328	ND<0.0261
Total PCBs	1	**1.09**	**1.18**	0.187	**10.3 D**	0.0586	**3.06**	0.223

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	SS-28-W20S10-3" 11/29/2016 3"	SS-28-W20N10-3" 11/29/2016 3"	SS-28-W30-3" 10/29/2016 3"	SS-28-E10-3" 10/18/2016 3"	SS-28-E10-1' 10/18/2016 1'	SS-28-N10-3" 10/18/2016 3"	SS-28-N10-2' 10/18/2016 2'
PCBs (mg/kg)								
Aroclor 1016	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1221	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1232	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1242	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1248	NE	ND<0.0325	ND<0.0324	ND<0.0316	0.0931	ND<0.0295	0.991	2.9 D
Aroclor 1254	NE	ND<0.0325	ND<0.0324	ND<0.0316	0.161	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1260	NE	ND<0.0325	0.0424	ND<0.0316	0.125	0.248	0.254	0.807 D
Aroclor 1262	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Aroclor 1268	NE	ND<0.0325	ND<0.0324	ND<0.0316	ND<0.0288	ND<0.0295	ND<0.032	ND<0.147
Total PCBs	1	ND<0.0325	0.0424	ND<0.0316	0.379	0.248	**1.25**	**3.7 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	SS-28-N10-3' 10/18/2016 3'	SS-28-N20-3" 10/18/2016 3"	SS-28-N20-2' 10/18/2016 2'	SS-28-S10-3" 10/18/2016 3"	SS-28-S10-1' 10/18/2016 1'	SS-28-S10-2' 10/18/2016 2'	SS-28-S20-1' 10/18/2016 1'
PCBs (mg/kg)								
Aroclor 1016	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1221	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1232	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1242	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1248	NE	0.232	0.228	ND<0.0279	0.476	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1254	NE	ND<0.0271	ND<0.03	0.598	ND<0.0305	ND<0.0312	ND<0.0251	0.0973
Aroclor 1260	NE	0.117	0.216	0.233	0.107	1	ND<0.0251	0.0909
Aroclor 1262	NE	ND<0.0271	ND<0.03	ND<0.0279	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Aroclor 1268	NE	ND<0.0271	ND<0.03	0.141	ND<0.0305	ND<0.0312	ND<0.0251	ND<0.0286
Total PCBs	1	0.348	0.444	0.971	0.583	1	ND<0.0251	0.188

Notes:
D = Result is from an analysis that required a dilution
ND = Non-detect
NE = Not established

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria

Table 4B
October 2016 to 2017 SS-31 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31 7/27/2016 3"	SS-31-1' 10/18/2016 1'	SS-31-2' 10/18/2016 2'	SS-31-W10-3" 10/18/2016 3"	SS-31-W10-2' 10/18/2016 2'	SS-31-W20-3" 10/18/2016 3"	SS-31-W20-2' 10/18/2016 2'	SS-31-E10-3" 10/18/2016 3"	SS-31-E10-2' 10/18/2016 2'	SS-31-E20-3" 10/18/2016 3"	SS-31-E20-2' 10/18/2016 2'	SS-31-E20-4' 10/18/2016 4'	SS-31-E20N10-3" 11/30/2016 3"	SS-31-E20N10-2' 11/30/2016 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1221	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1232	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1242	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1248	NE	NE	NE	0.775	5.39 D	ND<0.0309	0.823	ND<0.0272	0.149	ND<0.0266	4.42 D	ND<0.0304	ND<0.0308	4.72 D	ND<0.0267	ND<0.0347	0.261
Aroclor 1254	NE	NE	NE	ND<0.0322	ND<0.615	0.26	ND<0.03	ND<0.0272	ND<0.0296	0.144	ND<0.309	0.181	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1260	NE	NE	NE	0.191	1.21 D	0.134	ND<0.03	0.116	0.101	0.0757	1.09 D	0.143	ND<0.0308	0.956 D	ND<0.0267	ND<0.0347	0.176
Aroclor 1262	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	0.173	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Aroclor 1268	NE	NE	NE	ND<0.0322	ND<0.615	ND<0.0309	ND<0.03	ND<0.0272	ND<0.0296	ND<0.0266	ND<0.309	ND<0.0304	ND<0.0308	ND<0.152	ND<0.0267	ND<0.0347	ND<0.0329
Total PCBs	1	15	50	0.965	**6.6 D**	0.394	0.996	0.116	0.25	0.22	**5.51 D**	0.325	ND<0.0308	**5.68 D**	ND<0.0267	ND<0.0347	0.437

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-E20S10-3" 11/30/2016 3"	SS-31-E20S10-2' 11/30/2016 2'	SS-31-E20S10-3.5' 11/30/2016 3.5'	SS-31-E30-3" 11/30/2016 3"	SS-31-E30-2' 11/30/2016 2'	SS-31-N10-3" 10/18/2016 3"	SS-31-N10-2' 10/18/2016 2'	SS-31-N10-3' 10/18/2016 3'	SS-31-N20-3" 10/18/2016 3"	SS-31-N20-2' 10/18/2016 2'	SS-31-N20-4' 10/18/2016 4'	SS-31-N20W10-3" 11/30/2016 3"	SS-31-N20W10-2' 11/30/2016 2'	SS-31-N20E10-3" 11/30/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1221	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1232	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1242	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1248	NE	NE	NE	0.138	6.54 D	ND<0.028	ND<0.0352	ND<0.0354	1.98 D	1.31	ND<0.0253	0.443	1.4	ND<0.0251	0.108	0.311	0.0691
Aroclor 1254	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1260	NE	NE	NE	ND<0.0316	1.23 D	ND<0.028	ND<0.0352	ND<0.0354	0.202 D	0.498	ND<0.0253	ND<0.0308	0.192	ND<0.0251	ND<0.0356	0.107	0.0462
Aroclor 1262	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Aroclor 1268	NE	NE	NE	ND<0.0316	ND<0.325	ND<0.028	ND<0.0352	ND<0.0354	ND<0.149	ND<0.0296	ND<0.0253	ND<0.0308	ND<0.0303	ND<0.0251	ND<0.0356	ND<0.0276	ND<0.0369
Total PCBs	1	15	50	0.138	**7.77 D**	ND<0.028	ND<0.0352	ND<0.0354	**2.18 D**	**1.81**	ND<0.0253	0.443	**1.59**	ND<0.0251	0.108	0.418	0.115

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-N20E10-2' 11/30/2016 2'	SS-31-N30-3" 11/30/2016 3"	SS-31-N30-2' 11/30/2016 2'	SS-31-N30-3' 11/30/2016 3'	SS-31-N40-2' 11/30/2016 2'	SS-31-N40-3' 11/30/2016 3'	SS-31-N40-4' 11/30/2016 4'	SS-31-S10-3" 10/18/2016 3"	SS-31-S10-2' 10/18/2016 2'	SS-31-S20-3" 10/18/2016 3"	SS-31-S20-2' 10/18/2016 2'	SS-31-S20-3' 10/18/2016 3'	SS-31-S20W10-3" 11/30/2016 3"	SS-31-S20W10-2' 11/30/2016 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1221	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1232	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1242	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1248	NE	NE	NE	0.0557	ND<0.0347	69.6 D	0.163	7.06 D	ND<0.0326	0.084 HT-PCB	7.93 D	ND<0.0268	0.986	ND<0.0292	ND<0.0266	ND<0.0338	0.449
Aroclor 1254	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	0.827	ND<0.0272	ND<0.61	ND<0.0268	0.951	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1260	NE	NE	NE	0.0847	ND<0.0347	8.85 D	ND<0.0307	0.611 D	0.199	ND<0.0272	0.871 D	0.0677	0.23	0.281	ND<0.0266	ND<0.0338	0.281
Aroclor 1262	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	0.192	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Aroclor 1268	NE	NE	NE	ND<0.0315	ND<0.0347	ND*<3.04	ND<0.0307	ND<0.306	ND<0.0326	ND<0.0272	ND<0.61	ND<0.0268	ND<0.0303	ND<0.0292	ND<0.0266	ND<0.0338	ND<0.0321
Total PCBs	1	15	50	0.14	ND<0.0347	**78.5 D**	0.163	**7.67 D**	**1.22**	0.084 HT-PCB	**8.8 D**	0.0677	**1.22**	**1.23**	ND<0.0266	ND<0.0338	0.73

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-S20E10-3" 11/30/2016 3"	SS-31-S20E10-2' 11/30/2016 2'	SS-31-S25E30-3" 11/30/2016 3"	SS-31-S25E30-2' 11/30/2016 2'	SS-31-S25E30-3' 11/30/2016 3'	SS-31-S30-3" 11/30/2016 3"	DUP (SS-31-S30-3") 11/30/2016 3"	SS-31-S30-2' 11/30/2016 2'	LB-31-S25E30-SO1 (2') 6/8/2017 2'	LB-31-S25E30-SO3 (2') 6/8/2017 2'	LB-31-S25E30-SO5 (2') 6/8/2017 2'	LB-31-N30-SO2 (2') 6/8/2017 2'	LB-31-N30-SO2 (3') 10/24/2017 3'	LB-31-N30-SO2 (4') 10/24/2017 4'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1221	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1232	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1242	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1248	NE	NE	NE	ND<0.0345	ND<0.0316	0.179	8.05 D	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	1.29	44.7 D	0.84
Aroclor 1254	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1260	NE	NE	NE	ND<0.0345	0.177	ND<0.034	1.3 D	ND<0.0286	ND<0.0332	ND<0.0329	0.179	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	9.15 D	0.175
Aroclor 1262	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Aroclor 1268	NE	NE	NE	ND<0.0345	ND<0.0316	ND<0.034	ND<0.329	ND<0.0286	ND<0.0332	ND<0.0329	ND<0.0345	ND<0.0311	ND<0.031	ND<0.0268	ND<0.0343	ND*<2.97	ND<0.025
Total PCBs	1	15	50	ND<0.0345	0.177	0.179	**9.35 D**	ND<0.0286	ND<0.0332	ND<0.0329	0.179	ND<0.0311	ND<0.031	ND<0.0268	**1.29**	**53.9 D**	**1.01**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-31-N30-SO2 (5') 10/24/2017 5'	LB-31-N30-S02 (7') 10/24/2017 7'	LB-31-N30-SO1 (2') 6/8/2017 2'	LB-31-N30-SO1 (4') 6/8/2017 4'	LB-31-N30-SO3 (2') 6/8/2017 2'	LB-31-N40-SO5 (2') 6/8/2017 2'	LB-31-N40-SO7 (2') 6/9/2017 2'	LB-31-N40-SO7 (3') 6/9/2017 3'	LB-31-N40-S7 (4') 10/24/2017 4'	LB-31-N40-S7 (6') 10/24/2017 6'	LB-31-N40-S7 (7') 10/24/2017 7'	LB-31-N40-SO8 (2') 6/9/2017 2'	LB-31-N40-SO8 (4') 6/9/2017 4'	2017.09_LB-31-N40-SO8 (5') 9/14/2017 5'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1221	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1232	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1242	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1248	NE	NE	NE	3.84 D, HT-04	7.840	1.29	ND<0.029	ND<0.0322	ND<0.0317	4.39 D	2.42 D	12.8 D	2.12 D	0.28 HT-04	81.6 D	ND<0.142	ND<0.026
Aroclor 1254	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	0.0834	ND<0.155	1.16 D	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	2.14 D	ND<0.026
Aroclor 1260	NE	NE	NE	ND<0.256	1.170	0.208	ND<0.029	ND<0.0322	ND<0.0317	0.531 D	ND<0.14	1.93 D	0.335 D	ND<0.0254	13.7 D	ND<0.142	ND<0.026
Aroclor 1262	NE	NE	NE	0.629 D, HT-04	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Aroclor 1268	NE	NE	NE	ND<0.256	ND<0.265	ND<0.0325	ND<0.029	ND<0.0322	ND<0.0317	ND<0.155	ND<0.14	ND<0.497	ND<0.123	ND<0.0254	ND<3.61	ND<0.142	ND<0.026
Total PCBs	1	15	50	**4.47 D, HT-04**	**9.01**	**1.5**	ND<0.029	ND<0.0322	0.0834	**4.92 D**	**3.58 D**	**14.8 D**	**2.45 D**	0.28 HT-04	**95.3 D**	**2.14 D**	ND<0.026

Notes:
D = Result is from an analysis that required a dilution
HT-PCB = This sample was extracted outside of the CTDEEP RCP or other State recommended holding time. The USEPA per SW-846 has issued a revision extending PCB hold time to 1 year or longer.
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
NE = Not established
TSCA = Toxic Substances Control Act

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard
Bold, highlighted, and in red indicate an exceedance of the TSCA Threshold for Hazardous Waste

Table 4B
October 2016 to 2017 SS-31 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-31-N40-SO9 (2') 6/9/2017 2'	LB-31-N40-SO9 (4') 6/9/2017 4'	2017.09_LB-31-N40-SO9 (5') 9/14/2017 5'	LB-31-N40-SO10 (3") 8/2/2017 3"	LB-31-N40-SO10 (2') 8/2/2017 2'	LB-31-N40-SO10 (4') 8/2/2017 4'	LB-31-N40-SO11 (2') 8/2/2017 2'	LB-31-N40-SO11 (4') 8/2/2017 4'	LB-31-N40-SO12 (2') 8/2/2017 2'	LB-31-N40-SO12 (4') 8/2/2017 4'	LB-31-N40-SO12 (5') 8/2/2017 5'	2017.09_LB-31-N40-SO12 (6') 9/14/2017 6'	LB-31-N40-SO14 (2') 8/2/2017 2'	LB-31-N40-SO14 (4') 8/2/2017 4'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1221	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1232	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1242	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1248	NE	NE	NE	6.62 D	3.07 D	ND<0.0265	1.44 D	0.227	0.0441	1.08	0.684	15.1 D	1.12	1.37	ND<0.0248	ND<0.0313	60.7 D
Aroclor 1254	NE	NE	NE	3.1 D	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	0.501	ND<0.0259	ND<0.0248	0.444	ND<2.97
Aroclor 1260	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	0.419 D	0.122	ND<0.267	ND<0.0255	0.217	2.06 D	ND<0.0272	0.376	ND<0.0248	0.192	10.2 D
Aroclor 1262	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Aroclor 1268	NE	NE	NE	ND<0.143	ND<0.283	ND<0.0265	ND<0.148	ND<0.0282	ND<0.267	ND<0.0255	ND<0.0253	ND<0.275	ND<0.0272	ND<0.0259	ND<0.0248	ND<0.0313	ND<2.97
Total PCBs	1	15	50	**9.71 D**	**3.07 D**	ND<0.0265	**1.86 D**	0.349	0.0441	**1.08**	0.901	**17.2 D**	**1.62**	**1.74**	ND<0.0248	0.637	**70.8 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-31-N40-SO14 (5') 8/2/2017 5'	2017.09_LB-31-N40-SO14 (6') 9/14/2017 6'	LB-31-N30-SO15 (2') 8/2/2017 2'	LB-31-N30-SO15 (4') 8/2/2017 4'	LB-31-N30-SO16 (2') 8/2/2017 2'	LB-31-N30-SO16 (4') 8/2/2017 4'	2017.09_LB-31-N30-SO16 (5') 9/14/2017 5'	LB-31-N30-SO17 (2') 8/2/2017 2'	LB-31-N30-SO17 (4') 8/2/2017 4'	LB-31-N30-SO18 (3") 8/2/2017 3"	LB-31-N30-SO18 (2') 8/2/2017 2'	LB-31-N30-SO18 (4') 8/2/2017 4'	2017.09_SS31_1A (3") 9/13/2017 3"	2017.09_SS31_1A (2') 9/13/2017 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1221	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1232	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1242	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1248	NE	NE	NE	76.3 D	0.408	3.73 D	0.384	4.85 D	0.767	ND<0.0251	6.36 D	0.407	ND<0.0267	0.587	0.137	ND<0.0305	ND<0.0302
Aroclor 1254	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	0.249	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	0.165
Aroclor 1260	NE	NE	NE	16.7 D	ND<0.0247	1 D	0.105	0.665 D	ND<0.0258	ND<0.0251	1.19 D	0.155	0.0778 D	0.242	ND<0.0264	ND<0.0305	0.0803
Aroclor 1262	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Aroclor 1268	NE	NE	NE	ND<2.71	ND<0.0247	ND<0.294	ND<0.0258	ND<0.143	ND<0.0258	ND<0.0251	ND<0.293	ND<0.0299	ND<0.0267	ND<0.0286	ND<0.0264	ND<0.0305	ND<0.0302
Total PCBs	1	15	50	**93 D**	0.408	**4.73 D**	0.489	**5.51 D**	**1.02**	ND<0.0251	**7.55 D**	0.561	0.0778 D	0.829	0.137	ND<0.0305	0.246

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	2017.09_SS31_1A (4') 9/13/2017 4'	2017.09_SS31_1A (5') 9/13/2017 5'	2017.09_SS31_2A (2') 9/13/2017 2'	2017.09_SS31_2A (4') 9/13/2017 4'	2017.09_SS31_2A (5') 9/13/2017 5'	2017.09_SS31_2B (3") 9/13/2017 3"	2017.09_SS31_2B (4') 9/13/2017 4'	2017.09_SS31_3A (3") 9/13/2017 3"	2017.09_SS31_3A (2') 9/13/2017 2'	2017.09_SS31_3A (4') 9/13/2017 4'	2017.09_SS31_4A (2') 9/13/2017 2'	2017.09_SS31_4A (4') 9/13/2017 4'	2017.09_SS31_4A (5') 9/13/2017 5'	2017.09_SS31_4B (3") 9/13/2017 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1221	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1232	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1242	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1248	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	21.5 D	ND<0.0243	ND<0.0305	0.18	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	3.79 D	0.302	ND<0.0269
Aroclor 1254	NE	NE	NE	0.409	ND<0.0272	0.162	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	0.229	0.126	0.585	ND<0.527	ND<0.0246	0.0517 HT-01
Aroclor 1260	NE	NE	NE	ND<0.031	ND<0.0272	0.0817	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	0.0577	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Aroclor 1262	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	2.73 D	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	0.0783	0.13	0.75 D	ND<0.0246	ND<0.0269
Aroclor 1268	NE	NE	NE	ND<0.031	ND<0.0272	ND<0.0294	ND<0.579	ND<0.0243	ND<0.0305	ND<0.0261	ND<0.0261	ND<0.0284	ND<0.031	ND<0.0265	ND<0.527	ND<0.0246	ND<0.0269
Total PCBs	1	15	50	0.409	ND<0.0272	0.243	**24.2 D**	ND<0.0243	ND<0.0305	0.18	ND<0.0261	0.287	0.204	0.714	**4.54 D**	0.302	0.0517 HT-01

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	2017.09_SS31_4B (4') 9/13/2017 4'	2017.09_SS31_5A (3") 9/13/2017 3"	2017.09_SS31_5A (2') 9/13/2017 2'	2017.09_SS31_6A (2') 9/13/2017 2'	2017.09_SS31_6A (4') 9/13/2017 4'	2017.09_SS31_6A (5') 9/13/2017 5'	2017.09_SS31_6B (3") 9/13/2017 3"	2017.09_SS31_6B (2') 9/13/2017 2'	2017.09_SS31_6B (4') 9/13/2017 4'	2017.09_SS31_6B (5') 9/13/2017 5'	2017.09_SS31_6C (2') 9/13/2017 2'	2017.09_SS31_6C (4') 9/13/2017 4'	SS-31-6C (6') 10/25/2017 6'	SS-31-6C (7') 10/25/2017 7'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1221	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1232	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1242	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1248	NE	NE	NE	0.111	ND<0.0277	0.707	20.7 D	ND<0.0265	ND<0.0266	ND<0.0288	1.37	0.937	ND<0.0282	ND<0.028	78.1 D	7.12 D	14.1 D
Aroclor 1254	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1260	NE	NE	NE	0.0321	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	0.377	0.118	ND<0.0282	ND<0.028	11.5 D	1.13 D	2.34 D
Aroclor 1262	NE	NE	NE	ND<0.0248	ND<0.0277	0.225	2.59 D	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Aroclor 1268	NE	NE	NE	ND<0.0248	ND<0.0277	ND<0.0293	ND<0.576	ND<0.0265	ND<0.0266	ND<0.0288	ND<0.028	ND<0.0287	ND<0.0282	ND<0.028	ND<3.14	ND<0.29	ND<0.288
Total PCBs	1	15	50	0.143	ND<0.0277	0.931	**23.3 D**	ND<0.0265	ND<0.0266	ND<0.0288	**1.75**	**1.06**	ND<0.0282	ND<0.028	**89.6 D**	**8.25 D**	**16.4 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-31-6C (8') 10/25/2017 8'	SS-31-6C (9') 10/25/2017 9'	2017.09_SS31_7A (3") 9/13/2017 3"	2017.09_SS31_7A (2') 9/13/2017 2'	2017.09_SS31_7B (2') 9/13/2017 2'	2017.09_SS31_7B (4') 9/13/2017 4'	SS-31-8A (3") 10/25/2017 3"	SS-31-8A (2') 10/25/2017 2'	SS-31-8A (4') 10/25/2017 4'	SS-31-9A (4') 10/25/2017 4'	SS-31-9A (5') 10/25/2017 5'	SS-31-10A (3") 10/25/2017 3"	SS-31-10A (4') 10/25/2017 4'
PCBs (mg/kg)																
Aroclor 1016	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1221	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1232	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1242	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1248	NE	NE	NE	23.4 D, HT-04	ND<0.239	ND<0.03	0.103	1.23	0.68 HT-01	ND<0.0309	0.201	0.0367 HT-04	1.92 D	0.237	ND<0.0293	0.539
Aroclor 1254	NE	NE	NE	ND*<1.33	0.0933	0.0679 HT-01	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Aroclor 1260	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	0.0397	0.274	0.213 HT-01	ND<0.0309	0.107	ND<0.0315	0.254 D	ND<0.0263	ND<0.0293	0.114
Aroclor 1262	NE	NE	NE	3.97 D, HT-04	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	0.0451	ND<0.0293	ND<0.0251
Aroclor 1268	NE	NE	NE	ND*<1.33	ND<0.0242	ND<0.03	ND<0.0309	ND<0.0291	ND<0.0278	ND<0.0309	ND<0.027	ND<0.0315	ND<0.139	ND<0.0263	ND<0.0293	ND<0.0251
Total PCBs	1	15	50	**27.4 D, HT-04**	0.332	0.0679 HT-01	0.143	**1.5**	0.893 HT-01	ND<0.0309	0.308	0.0367 HT-04	**2.17 D**	0.282	ND<0.0293	0.652

Notes:
D = Result is from an analysis that required a dilution
HT-PCB = This sample was extracted outside of the CTDEEP RCP or other State recommended holding time. The USEPA per SW-846 has issued a revision extending PCB hold time to 1 year or longer.
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
NE = Not established
TSCA = Toxic Substances Control Act

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard
Bold, highlighted, and in red indicate an exceedance of the TSCA Threshold for Hazardous Waste

Table 4C
October 2016 to 2017 SS-37 PCB Delineation Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37 7/27/2016 3"	SS-37-1' 10/18/2016 1'	SS-DUP1 RE (SS-37-1') 10/18/2016 1'	SS-37-2' 10/18/2016 2'	SS-37-4' 10/18/2016 4'	SS-37-W10-3" 10/18/2016 3"	SS-37-W10-2' 10/18/2016 2'	SS-37-W20-3" 10/18/2016 3"	SS-37-W20-2' 10/18/2016 2'	SS-37-W20-4' 10/18/2016 4'	SS-37-W20N10-3" 11/29/2016 3"	SS-37-W20N10-2' 11/29/2016 2'	SS-37-W20N10-4' 11/29/2016 4'	SS-37-W20S10-3" 11/29/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1221	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1232	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1242	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1248	NE	NE	NE	4.19 D	174 D	113 D	6.98 D	0.333	10 D	0.303	1.64	112 D	ND<0.0255	ND<0.0312	10.5 D	0.113	0.0633
Aroclor 1254	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1260	NE	NE	NE	0.845 D	ND*<14.8	11.5 D	ND<0.285	0.113	1.39 D	0.0835	0.242	11.9 D	ND<0.0255	ND<0.0312	1.33 D	ND<0.0274	ND<0.0352
Aroclor 1262	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	5.73 D	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Aroclor 1268	NE	NE	NE	ND<0.316	ND*<14.8	ND*<2.77	ND<0.285	ND<0.0315	ND<0.596	ND<0.0279	ND<0.0307	ND*<2.77	ND<0.0255	ND<0.0312	ND<0.305	ND<0.0274	ND<0.0352
Total PCBs	1	15	50	**5.03 D**	**174 D**	**124 D**	**12.7 D**	0.446	**11.4 D**	0.386	**1.88**	**123 D**	ND<0.0255	ND<0.0312	**11.8 D**	0.113	0.0633

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-W20S10-2' 11/29/2016 2'	SS-37-W30-3" 11/29/2016 3"	SS-37-W30-2' 11/29/2016 2'	SS-37-E10-3" 10/18/2016 3"	SS-37-E10-2' 10/18/2016 2'	SS-37-E10-4' 10/18/2016 4'	SS-37-E20-3" 10/18/2016 3"	SS-37-E20-2' 11/30/2016 2'	SS-37-E20-3' 11/30/2016 3'	SS-37-E20-5' 11/30/2016 5'	SS-37-N10-3" 10/18/2016 3"	SS-37-N10-2' 10/18/2016 2'	SS-37-N10-4' 10/18/2016 4'	SS-37-N20-3" 10/18/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1221	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1232	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1242	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1248	NE	NE	NE	0.0881	ND<0.0328	0.591	0.172	1.58	ND<0.0257	1.26	0.879	2.7 D	ND<0.033	231 D	0.908	0.365	3.77 D
Aroclor 1254	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	1.43	0.246	ND<0.0356	ND<0.0348	ND<0.162	0.67	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1260	NE	NE	NE	ND<0.0305	ND<0.0328	0.174	0.121	ND<0.0304	0.151	0.175	0.123	0.261 D	0.189	19.7 D	0.208	0.112	0.614 D
Aroclor 1262	NE	NE	NE	0.17	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	0.181	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Aroclor 1268	NE	NE	NE	ND<0.0305	ND<0.0328	ND<0.0284	ND<0.0285	ND<0.0304	ND<0.0257	ND<0.0356	ND<0.0348	ND<0.162	ND<0.033	ND*<14.6	ND<0.0283	ND<0.0289	ND<0.147
Total PCBs	1	15	50	0.258	ND<0.0328	0.765	0.293	**3.02**	0.397	**1.43**	1	**2.96 D**	**1.04**	**250 D**	**1.12**	0.477	**4.39 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-N20-2' 10/18/2016 2'	SS-37-N20-4' 10/18/2016 4'	SS-37-N20-5' 10/18/2016 5'	SS-37-N20-6' 11/30/2016 6'	SS-37-N20W10-3" 11/29/2016 3"	SS-37-N20W10-5' 11/29/2016 5'	SS-37-N20W20-2' 11/29/2016 2'	SS-37-N20W20-4' 11/29/2016 4'	SS-37-N20E10-3" 11/29/2016 3"	SS-37-N20E10-2' 11/29/2016 2'	SS-37-N20E10-5' 11/29/2016 5'	SS-37-N20E20-3" 11/29/2016 3"	SS-37-N20E20-2' 11/29/2016 2'	SS-37-N30-3" 11/29/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1221	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1232	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1242	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1248	NE	NE	NE	0.769	1.31	ND<0.14	0.336	ND<0.0332	8.56 D	ND<0.0322	1.45	0.326	0.0301	0.38	ND<0.0294	0.0801	
Aroclor 1254	NE	NE	NE	0.762	ND<0.0324	2.43 D	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1260	NE	NE	NE	0.248	0.205	0.547 D	0.251	ND<0.0332	0.112	0.682 D	0.0507	0.198	0.0939	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1262	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Aroclor 1268	NE	NE	NE	ND<0.0274	ND<0.0324	ND<0.14	ND<0.0306	ND<0.0332	ND<0.0269	ND<0.326	ND<0.0322	ND<0.031	ND<0.0339	ND<0.026	ND<0.0263	ND<0.0294	ND<0.0307
Total PCBs	1	15	50	**1.78**	**1.51**	**2.98 D**	0.587	ND<0.0332	0.82	**9.25 D**	0.0507	**1.65**	0.42	0.0301	0.38	ND<0.0294	0.0801

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-N30-5' 11/29/2016 5'	SS-37-N30-6' 11/29/2016 6'	SS-37-N40-3" 7/19/2017 3"	SS-37-N40-2' 7/19/2017 2'	SS-37-N40-4' 7/19/2017 4'	SS-37-N40-5' 11/29/2016 5'	SS-37-S10-3" 10/18/2016 3"	SS-37-S10-2' 10/18/2016 2'	SS-37-S20-3" 10/18/2016 3"	SS-37-S20-2' 10/18/2016 2'	SS-37-S20-4' 10/18/2016 4'	SS-37-S20W10-3" 11/29/2016 3"	SS-37-S20W10-2' 11/29/2016 2'	SS-37-S20E10-3" 11/29/2016 3"
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1221	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1232	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1242	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1248	NE	NE	NE	9.63 D	0.0426	0.0952	13.3 D	14.4 D	0.189	318 D	0.386	0.598	1.01	0.101	ND<0.0321	0.127	0.0563
Aroclor 1254	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	5.56 D	5.77 D	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	1.47	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1260	NE	NE	NE	1.54 D	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	0.0326	ND*<29.3	0.105	0.222	0.698	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Aroclor 1262	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	0.287	ND<0.0303
Aroclor 1268	NE	NE	NE	ND<0.319	ND<0.0269	ND<0.0299	ND<0.312	ND<0.3	ND<0.0259	ND*<29.3	ND<0.0274	ND<0.0286	ND<0.0297	ND<0.0282	ND<0.0321	ND<0.0324	ND<0.0303
Total PCBs	1	15	50	**11.2 D**	0.0426	0.0952	**18.9 D**	**20.2 D**	0.222	**318 D**	0.491	0.821	**3.17**	0.101	ND<0.0321	0.414	0.0563

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	SS-37-S20E10-2' 11/29/2016 2'	SS-37-S30-3" 11/29/2016 3"	SS-37-S30-2' 11/29/2016 2'	LB-37-N20W20-SO2 (2') 6/8/2017 2'	DUP-1_6.8.17 (LB-37-N20W20-SO2 (2')) 6/8/2017 2'	LB-37-N20W20-SO3 (2') 6/8/2017 2'	LB-37-N20W20-SO4 (3") 6/8/2017 3"	LB-37-N20W20-SO4 (2') 6/8/2017 2'	LB-37-N40-SO1 (2') 8/2/2017 2'	LB-37-N40-SO1 (3.5') 8/2/2017 3.5'	LB-37-N40-SO2 (1.5') 8/2/2017 1.5'	LB-37-N40-SO3 (2') 8/2/2017 2'	LB-37-N40-SO3 (4') 8/2/2017 4'	LB-37-N40-SO4 (2') 8/2/2017 2'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1221	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1232	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1242	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1248	NE	NE	NE	0.0946	0.0728	0.152	0.533	0.503	0.213	ND<0.0334	0.141	11.4 D	481 D	41 D	20.4 D	0.161	4.85 D
Aroclor 1254	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Aroclor 1260	NE	NE	NE	0.0668	ND<0.0349	0.117	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	2.41 D	62.5 D	3.24 D	5.33 D	ND<0.0258	ND<0.0258
Aroclor 1262	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	1.68 D
Aroclor 1268	NE	NE	NE	ND<0.0339	ND<0.0349	ND<0.0331	ND<0.0325	ND<0.0328	ND<0.0285	ND<0.0334	ND<0.0321	ND<0.556	ND<14.6	ND<1.5	ND<0.602	ND<0.0258	ND<0.0258
Total PCBs	1	15	50	0.161	0.0728	0.27	0.533	0.503	0.213	ND<0.0334	0.141	**13.8 D**	**543 D**	**44.2 D**	**25.8 D**	0.161	**6.53 D**

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	LB-37-N40-SO4 (4') 8/2/2017 4'	LB-37-N40-SO5 (2') 8/2/2017 2'	LB-37-N40-SO5 (4') 8/2/2017 4'	LB-37-N40-SO5 (5') 8/2/2017 5'	2017.09_LB-37-N40-SO5 (6') 9/14/2017 6'	2017.09_SS37_1A (2') 9/14/2017 2'	2017.09_SS37_1A (4') 9/14/2017 4'	2017.09_SS37_1A (5') 9/14/2017 5'	2017.09_SS37_1A (6') 9/14/2017 6'	2017.09_SS37_1B (4') 9/14/2017 4'	2017.09_SS37_1B (5') 9/14/2017 5'	2017.09_SS37_2A (2') 9/14/2017 2'	2017.09_SS37_2A (4') 9/14/2017 4'	2017.09_SS37_2A (5') 9/14/2017 5'
PCBs (mg/kg)																	
Aroclor 1016	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1221	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1232	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1242	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1248	NE	NE	NE	0.196	0.154 HT-01	2.49 D, HT-01	6.51 D	ND<0.0441	0.582	0.959	3.41 D	ND<0.0332	1.14	ND<0.0254	1.96 D	14.1 D	0.349
Aroclor 1254	NE	NE	NE	0.24	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1260	NE	NE	NE	ND<0.0299	ND<0.0277	1.04 D, HT-01	1.11 D	ND<0.0441	0.0735	0.305	0.664 D	ND<0.0332	0.25	ND<0.0254	ND<0.147	2.27 D	0.046
Aroclor 1262	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Aroclor 1268	NE	NE	NE	ND<0.0299	ND<0.0277	ND<0.133	ND<0.163	ND<0.0441	ND<0.0282	ND<0.0315	ND<0.152	ND<0.0332	ND<0.0303	ND<0.0254	ND<0.147	ND<0.751	ND<0.0264
Total PCBs	1	15	50	0.436	0.154	**3.52 D**	**7.62 D**	ND<0.0441	0.656	**1.26**	**4.07 D**	ND<0.0332	**1.39**	ND<0.0254	**1.96 D**	**16.4 D**	0.395

Sample ID Sampling Date Sampling Depth	Residential Direct Exposure Criteria	Significant Environmental Hazard	TSCA Threshold for Hazardous Waste	2017.09_SS37_2B (2') 9/14/2017 2'	2017.09_SS37_2B (4') 9/14/2017 4'	2017.09_SS37_3A (2') 9/14/2017 2'	2017.09_SS37_3A (4') 9/14/2017 4'	2017.09_SS37_3B (2') 9/14/2017 2'	2017.09_SS37_3B (4') 9/14/2017 4'	2017.09_SS37_3B (5') 9/14/2017 5'	2017.09_SS37_4A (2') 9/14/2017 2'	2017.09_SS37_4A (4') 9/14/2017 4'	2017.09_SS37_4B (2') 9/14/2017 2'	2017.09_SS37_4B (3'10") 9/14/2017 3'10"	SS-38-1A (8'-10') 10/24/2017 8'-10'
PCBs (mg/kg)															
Aroclor 1016	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1221	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1232	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1242	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1248	NE	NE	NE	1.15	0.399 HT-01	3.85 D	ND<0.0262	1.13	6.08 HT-01, D	0.189 HT-04	0.907	ND<0.0249	2.8 D	ND<0.0256	ND<0.0286
Aroclor 1254	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1260	NE	NE	NE	0.371	0.201 HT-01	ND<0.292	ND<0.0262	0.162	1.66 HT-01, D	ND<0.0249	0.162	ND<0.0249	0.536 D	ND<0.0256	ND<0.0286
Aroclor 1262	NE	NE	NE	ND<0.0283	ND<0.0275	8.09 D	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Aroclor 1268	NE	NE	NE	ND<0.0283	ND<0.0275	ND<0.292	ND<0.0262	ND<0.0315	ND<0.291	ND<0.0249	ND<0.0272	ND<0.0249	ND<0.135	ND<0.0256	ND<0.0286
Total PCBs	1	15	50	**1.52**	0.6 HT-01	**11.9 D**	ND<0.0262	**1.3**	**7.74 HT-01, D**	0.189 HT-04	**1.07**	ND<0.0249	**3.34 D**	ND<0.0256	ND<0.0286

Notes:
D = Result is from an analysis that required a dilution
HT-01 = This result was reported from an analysis conducted outside of the EPA recommended holding time.
HT-04 = NON-COMPLIANT - Client requested analysis be conducted outside of holding times.
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
NE = Not established
TSCA = Toxic Substances Control Act

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard
Bold, highlighted, and in red indicate an exceedance of the TSCA Threshold for Hazardous Waste

Table 5
June 2017 Surficial Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-39 (3")	SS-39 (1')	SS-40 (3")	SS-40 (1')	SS-41 (3")	SS-41 (1')	SS-42 (3")	SS-42 (1')	SS-43 (3")	SS-43 (1')	SS-44 (3")	SS-44 (1')	SS-45 (3")	SS-45 (1')	SS-46 (3")	SS-46 (1')	SS-47 (3")	SS-47 (1')	SS-48 (3")	SS-48 (1')	SS-49 (3")	SS-49 (6")	SS-49 (1')	SS-50 (3")	SS-50 (6")
Sampling Date			6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017
Sampling Depth			3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	6"	1'	3"	6 "
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1221	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1232	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1242	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1248	NE	NE	ND<0.0322	ND<0.0307	0.0667	0.38 HT-04	ND<0.0319	0.0361 HT-04	ND<0.0375	ND<0.0296	ND<0.0339	3.06 HT-04, D	0.0348	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	0.391 HT-04	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1254	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1260	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	0.181 HT-04	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	0.561 HT-04, D	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	0.174 HT-04	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1262	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Aroclor 1268	NE	NE	ND<0.0322	ND<0.0307	ND<0.0333	ND<0.0327	ND<0.0319	ND<0.0346	ND<0.0375	ND<0.0296	ND<0.0339	ND<0.154	ND<0.0317	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	ND<0.0341	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275
Total PCBs	1	15	ND<0.0322	ND<0.0307	0.0667	0.561 HT-04	ND<0.0319	0.0361 HT-04	ND<0.0375	ND<0.0296	ND<0.0339	**3.62 HT-04, D**	0.0348	ND<0.0285	ND<0.0322	ND<0.0289	ND<0.0322	ND<0.0283	ND<0.0305	ND<0.0295	ND<0.0326	0.565 HT-04	ND<0.0285	ND<0.0285	ND<0.0274	ND<0.0264	ND<0.0275

Sample ID	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-50 (1')	SS-51 (3")	SS-51 (6")	SS-51 (1')	SS-52 (3")	SS-52 (6")	SS-52 (1')	SS-53 (3")	SS-53 (6")	SS-53 (1')	SS-54 (3")	SS-54 (1')	SS-55 (3")	SS-55 (6")	SS-55 (1')	SS-56 (3")	SS-56 (6")	SS-56 (1')	SS-57 (3")	SS-57 (1')	SS-58 (3")	SS-58 (1')	SS-59 (3")	SS-59 (1')	SS-60 (3")
Sampling Date			6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017
Sampling Depth			1'	3"	6 "	1'	3"	6 "	1'	3"	6"	1'	3"	1'	3"	6"	1'	3"	6"	1'	3"	1'	3"	1'	3"	1'	3"
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1221	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1232	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1242	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1248	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	1.26 HT-04	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1254	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	0.14 HT-04	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1260	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	0.0595 HT-04	ND<0.0305	0.287 HT-04	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1262	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Aroclor 1268	NE	NE	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	ND<0.0314	ND<0.0305	ND<0.0325	ND<0.0357	ND<0.03	ND<0.0302
Total PCBs	1	15	ND<0.0276	ND<0.0267	ND<0.0266	ND<0.0273	ND<0.0279	ND<0.0276	ND<0.0283	ND<0.0267	ND<0.0267	ND<0.0278	ND<0.027	ND<0.0264	ND<0.0263	ND<0.027	ND<0.0278	ND<0.0275	ND<0.0269	ND<0.0268	ND<0.0333	0.2 HT-04	ND<0.0305	**1.54 HT-04**	ND<0.0357	ND<0.03	ND<0.0302

Sample ID	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-60 (1')	SS-61 (3")	SS-61 (1')	SS-62 (3")	SS-62 (1')	SS-63 (3")	SS-63 (6")	SS-63 (1')	SS-64 (3")	SS-64 (1')	SS-65 (3")	SS-65 (1')	SS-66 (3")	SS-66 (1')	SS-67 (3")	SS-67 (1')	SS-68 (3")	SS-68 (1')	SS-69 (3")	DUP-4_6.9.17 (SS-69 (3"))	SS-69 (1')	SS-70 (3")	SS-70 (1')	SS-71 (3")	SS-71 (1')
Sampling Date			6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017
Sampling Depth			1'	3"	1'	3"	1'	3"	6"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	3"	1'	3"	1'	3"	1'
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1221	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1232	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1242	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1248	NE	NE	0.0525 HT-04	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	0.509	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1254	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	0.329 HT-04	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1260	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	0.114	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	0.0473 HT-01	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	0.0532 HT-04
Aroclor 1262	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	0.271 HT-04	ND<0.0302	0.2 HT-04	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Aroclor 1268	NE	NE	ND<0.0283	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	ND<0.0316	ND<0.0311	ND<0.0306	ND<0.0302	ND<0.0306	ND<0.029	ND<0.0282	ND<0.0338	ND<0.0318	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	ND<0.0294
Total PCBs	1	15	0.0525 HT-04	ND<0.032	ND<0.0327	ND<0.0337	ND<0.0314	ND<0.0256	ND<0.0265	0.623	ND<0.0311	0.271 HT-04	ND<0.0302	0.529 HT-04	ND<0.029	ND<0.0282	ND<0.0338	0.0473 HT-01	ND<0.0313	ND<0.029	ND<0.0307	ND<0.0295	ND<0.0297	ND<0.0333	ND<0.0299	ND<0.0334	0.0532 HT-04

Sample ID	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-72 (3")	SS-72 (1')	SS-73 (3")	SS-73 (1')	SS-74 (3")	SS-74 (1')	SS-75 (3")	SS-75 (1')	SS-76 (3")	SS-76 (1')	SS-77 (3")	SS-77 (1')	SS-78 (3")	SS-78 (1')	SS-79 (3")	SS-79 (1')	SS-80 (3")	SS-80 (1')	SS-81 (3")	SS-81 (1')	SS-82 (3")	SS-82 (1')	SS-83 (3")	SS-83 (1')	SS-84 (3")
Sampling Date			6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017
Sampling Depth			3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1221	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1232	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1242	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1248	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	0.0481	0.315 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	1.11 HT-04	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1254	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	0.134 HT-04	ND<0.0335	0.232 HT-04	ND<0.0311	0.271 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	0.508 HT-04	ND<0.029	0.165 HT-04	ND<0.0305	1.47 HT-04	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1260	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1262	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	0.0629 HT-04	ND<0.0335	0.0742 HT-04	ND<0.0311	0.0785 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	0.191 HT-04	ND<0.029	0.122 HT-04	ND<0.0305	0.777 HT-04	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Aroclor 1268	NE	NE	ND<0.0349	ND<0.0295	ND<0.0339	ND<0.0337	ND<0.0335	ND<0.0292	ND<0.0311	ND<0.0289	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	ND<0.0321	ND<0.029	ND<0.031	ND<0.0305	ND<0.0309	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343
Total PCBs	1	15	ND<0.0349	ND<0.0295	ND<0.0339	0.197 HT-04	ND<0.0335	0.306 HT-04	0.0481	0.664 HT-04	ND<0.031	ND<0.0274	ND<0.0327	ND<0.0313	ND<0.0327	ND<0.0329	ND<0.0326	0.699 HT-04	ND<0.029	0.286 HT-04	ND<0.0305	**3.35 HT-04**	ND<0.033	ND<0.031	ND<0.0376	ND<0.031	ND<0.0343

Sample ID	Residential Direct Exposure Criteria	Significant Environmental Hazard	DUP-2_6.9.17 (SS-84 (3"))	SS-84 (1')	SS-85 (3")	SS-85 (1')	SS-86 (3")	SS-86 (1')	SS-87 (3")	SS-87 (1')	SS-88 (3")	SS-88 (1')	SS-89 (3")	SS-89 (1')	SS-90 (3")	SS-90 (1')	SS-91 (3")	SS-91 (1')	SS-92 (3")	SS-92 (1')	SS-93 (3")	SS-93 (1')	SS-94 (3")	SS-94 (1')	SS-95 (3")	SS-95 (1')	SS-96 (3")
Sampling Date			6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017
Sampling Depth			3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"	1'	3"
PCBs (mg/kg)																											
Aroclor 1016	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1221	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1232	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1242	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1248	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	1.03 HT-04	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	0.466 HT-04	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1254	NE	NE	ND<0.0345	0.202 HT-04	ND<0.0299	0.517 HT-04	ND<0.0355	0.942 HT-04	ND<0.0306	0.468 HT-04	ND<0.0318	0.16 HT-01	ND<0.0327	ND<0.0298	ND<0.0268	0.54 HT-01	ND<0.0358	0.125 HT-04	ND<0.0295	0.187 HT-04	ND<0.0299	ND<0.0306	ND<0.0361	0.553 HT-04	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1260	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1262	NE	NE	ND<0.0345	0.174 HT-04	ND<0.0299	0.193 HT-04	ND<0.0355	0.552 HT-04	ND<0.0306	0.226 HT-04	ND<0.0318	0.0694 HT-01	ND<0.0327	ND<0.0298	ND<0.0268	0.226 HT-01	ND<0.0358	ND<0.0308	ND<0.0295	0.201 HT-04	ND<0.0299	ND<0.0306	ND<0.0361	0.374 HT-04	ND<0.035	ND<0.031	ND<0.0291
Aroclor 1268	NE	NE	ND<0.0345	ND<0.0333	ND<0.0299	ND<0.0314	ND<0.0355	ND<0.0308	ND<0.0306	ND<0.0305	ND<0.0318	ND<0.0276	ND<0.0327	ND<0.0298	ND<0.0268	ND<0.0335	ND<0.0358	ND<0.0308	ND<0.0295	ND<0.0313	ND<0.0299	ND<0.0306	ND<0.0361	ND<0.0288	ND<0.035	ND<0.031	ND<0.0291
Total PCBs	1	15	ND<0.0345	0.376 HT-04	ND<0.0299	0.71 HT-04	ND<0.0355	**2.52 HT-04**	ND<0.0306	0.693 HT-04	ND<0.0318	0.229 HT-01	ND<0.0327	ND<0.0298	ND<0.0268	0.766 HT-01	ND<0.0358	0.59 HT-04	ND<0.0295	0.388 HT-04	ND<0.0299	ND<0.0306	ND<0.0361	0.927 HT-04	ND<0.035	ND<0.031	ND<0.0291

Sample ID	Residential Direct Exposure Criteria	Significant Environmental Hazard	SS-96 (1')	SS-97 (3")	SS-97 (6")	SS-97 (1')	SS-98 (3")	SS-98 (6")	SS-98 (1')	SS-99 (3")	SS-99 (6")	SS-99 (1')	SS-100 (3")	SS-100 (6")	SS-100 (1')	SS-101 (3")	SS-101 (6")	SS-101 (1')	SS-102 (3")	SS-102 (6")	SS-102 (1')	SS-103 (3")	SS-103 (6")	SS-103 (1')	SS-104 (3")	SS-104 (1')	SS-105 (3")	DUP-3_6.9.17 (SS-105 (3"))	SS-105 (1')
Sampling Date			6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017	6/9/2017
Sampling Depth			1'	3"	6"	1'	3"	6"	1'	3"	6"	1'	3"	6"	1'	3"	6"	1'	3"	6"	1'	3"	6"	1'	3"	1'	3"	3"	1'
PCBs (mg/kg)																													
Aroclor 1016	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1221	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1232	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1242	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1248	NE	NE	12.4 D, HT-04	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	0.584	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	0.815	ND<0.0264	ND<0.0285	2.26 D, HT-04	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	1.29 HT-04
Aroclor 1254	NE	NE	6.6 D, HT-04	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	2.72 D, HT-04	ND<0.0318	1.24 HT-04	ND<0.0288	ND<0.0272	1.05 HT-04
Aroclor 1260	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	0.0956	ND<0.0281	ND<0.0305	0.0336	ND<0.027	0.0415	0.0383	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Aroclor 1262	NE	NE	2.76 D, HT-04	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	2.13 D, HT-04	ND<0.0318	0.67 HT-04	ND<0.0288	ND<0.0272	0.263 HT-04
Aroclor 1268	NE	NE	ND<0.319	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	ND<0.0286	ND<0.0268	ND<0.0289	ND<0.0338	ND<0.0281	ND<0.0305	ND<0.0303	ND<0.027	ND<0.0311	ND<0.0282	ND<0.0269	ND<0.0297	ND<0.0318	ND<0.0264	ND<0.0285	ND<0.153	ND<0.0318	ND<0.0341	ND<0.0288	ND<0.0272	ND<0.0306
Total PCBs	1	15	**21.7 D, HT-04**	ND<0.0267	ND<0.0288	ND<0.0288	ND<0.0269	ND<0.0299	0.584	ND<0.0268	ND<0.0289	0.0956	ND<0.0281	ND<0.0305	0.0336	ND<0.027	0.0415	0.0383	ND<0.0269	ND<0.0297	0.815	ND<0.0264	ND<0.0285	**7.1 D, HT-04**	ND<0.0318	**1.91 HT-04**	ND<0.0288	ND<0.0272	**2.61 HT-04**

Notes:
D = Result is from an analysis that required a dilution.
HT-01 = This result was reported from an analysis conducted outside of the EPA recommended holding time.
HT-04 = NON-COMPLIANT - Client requested analysis be conducted outside of holding times.
ND = Non-detect
NE = Not established

Bold and shaded indicate an exceedance of the Residential Direct Exposure Criteria
Bold and highlighted indicate an exceedance of the Significant Environmental Hazard

Table 6A
October 2018 Soil Boring Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Depth (feet)/Parent Sample Sampling Date Sample Matrix	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-11_1-2 1-2 10/15/2018 Soil		SS-32_1-2 1-2 10/16/2018 Soil		SS-32_2-3 2-3 10/16/2018 Soil		SS-32_3-4 3-4 10/16/2018 Soil		SS-32_4-5 4-5 10/16/2018 Soil		SS-36_1-2 1-2 10/15/2018 Soil		SS-36_2-3 2-3 10/15/2018 Soil		SS-36_3-4 3-4 10/15/2018 Soil		SS-36_4-5 4-5 10/15/2018 Soil		SS-36_5-6 5-6 10/15/2018 Soil		SS-36_6-7 6-7 10/15/2018 Soil		SS-36_7-8 7-8 10/15/2018 Soil		SS-43_1-2 1-2 10/15/2018 Soil		SS-58_1-2 1-2 10/16/2018 Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds (VOCs)	mg/kg	mg/kg																													
1,2-Dibromoethane	0.007	0.1	NT		*0.0071*	U	NT		NT		NT		*0.0073*	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Acetone	500	140	NT		0.014	U	NT		NT		NT		0.015	U	NT		NT		NT		NT		NT		NT		NT		NT		0.01	U
cis-1,2-Dichloroethylene	~	~	NT		0.02		NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Tetrachloroethylene	12	1	NT		0.028		NT		NT		NT		0.033		NT		NT		NT		NT		NT		NT		NT		NT		0.16	
Toluene	500	67	NT		0.0071	U	NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
trans-1,2-Dichloroethylene	~	20	NT		0.0084		NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Trichloroethylene	56	1	NT		**3.7**	D	NT		NT		NT		0.086		NT		NT		NT		NT		NT		NT		NT		NT		0.13	
Vinyl Chloride	0.32	0.4	NT		0.0071	U	NT		NT		NT		0.0073	U	NT		NT		NT		NT		NT		NT		NT		NT		0.005	U
Semi-Volatile Organic Compounds (SVOCs)	mg/kg	mg/kg																													
Acenaphthene	1,000*	84*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Anthracene	1000	400	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Benzo(a)anthracene	1	1	NT		0.79	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.5**	D
Benzo(a)pyrene	1	1	NT		0.789	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.54**	D
Benzo(b)fluoranthene	1	1	NT		0.7	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.23**	D
Benzo(g,h,i)perylene	8.4*	1*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.907	D
Benzo(k)fluoranthene	8.4	1	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.21**	D
Carbazole	31*	1*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Chrysene	84*	1*	NT		0.749	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		**1.35**	D
Dibenzofuran	68*	1.4*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Fluoranthene	1000	56	NT		1.24	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		2.56	D
Fluorene	1000	56	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.673	U
Indeno(1,2,3-cd)pyrene	1*	1*	NT		0.626	U	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		0.836	D
Phenanthrene	1000	40	NT		0.789	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		1.08	D
Pyrene	1000	40	NT		1.14	D	NT		NT		NT		0.666	U	NT		NT		NT		NT		NT		NT		NT		NT		2.25	D
Pesticides	mg/kg	mg/kg																													
4,4'-DDD	1.8*	0.02*	NT		0.00315	U	NT		NT		NT		**0.112**	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
4,4'-DDT	1.8*	0.02*	NT		0.00315	U	NT		NT		NT		**0.16**	D	NT		**0.0447**		0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Alachlor	7.7	0.4	NT		0.00315	U	NT		NT		NT		0.122	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Aldrin	0.04*	0.01*	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	02AB152:BK152	U	NT		0.00335	U
beta-BHC	~	~	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Chlordane, total	0.49*	0.066*	NT		0.0629	U	NT		NT		NT		**0.514**	D	**0.0833**		0.0126	U	0.0551	U	0.0518	U	0.0525	U	0.0537	U	NT		*0.0669*	U
delta-BHC	~	~	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Dieldrin	0.038	0.007	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		**0.21**	D
Endrin	20*	0.4*	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Endrin aldehyde	20*	0.4*	NT		0.00315	U	NT		NT		NT		0.0571	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Endrin ketone	20*	0.4*	NT		0.00315	U	NT		NT		NT		0.135	D	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
gamma-BHC (Lindane)	20	0.04	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Heptachlor epoxide	0.067	0.02	NT		0.00315	U	NT		NT		NT		0.00335	U	NT		0.000631	U	0.00275	U	0.00259	U	0.00262	U	0.00269	U	NT		0.00335	U
Herbicides	Varies	Varies	NT		ND		NT		NT		NT		ND		NT		NT		NT		NT		NT		NT		NT		ND	
Extractable Total Petroleum Hydrocarbons (ETPH)	mg/kg	mg/kg																												
ETPH (Extractable Total Petroleum Hydrocarbons)	500	2500	NT		389		NT		NT		NT		195		NT		NT		NT		NT		NT		NT		NT		247	
Metals	mg/kg	mg/L			mg/kg								mg/kg																mg/kg	
Antimony	27	~	NT		12.9		NT		10.2		2.67	U	9.46		NT		3.16	U	2.75	U	2.61	U	2.62	U	2.69	U	NT		11.9	
Arsenic	10	~	NT		23.2		43.6		15.9		3.81		20		12.5		8.47		6.59		4.8		5.22		5.34		NT		26	
Barium	4700	~	NT		1880		NT		1170		513		1410		NT		1570		486		431		415		441		NT		1500	
Cadmium	34	~	NT		10.9		NT		9.9		0.747		11.9		NT		7.88		2.21		0.744		0.739		1.02		NT		28.7	
Chromium	4000	~	NT		251		NT		200		185		161		NT		95.5		125		137		143		131		NT		251	
Copper	2500	~	NT		1040		NT		636		51.2		1390		NT		603		204		37.8		45.9		72.2		NT		2180	
Lead	400	~	NT		3640		22900		2290		39.3		3260		1380		3590		391		23.9		32.8		90.6		NT		4970	
Mercury	20	~	NT		1.83		NT		0.719		0.032	U	0.929		NT		1.03		0.292		0.0313	U	0.0315	U	0.0582		NT		0.994	
Nickel	1400	~	NT		159		NT		156		90		145		NT		107		71.8		68.9		78.4		65.7		NT		357	
Silver	340	~	NT		3.9		NT		11.4		0.533	U	2.38		NT		5.05		0.551	U	0.521	U	0.525	U	0.537	U	NT		2.46	
Vanadium	470	~	NT		133		NT		486		91.1		126		NT		74		76.5		86.1		88.4		80.7		NT		174	
Zinc	20000	~	NT		2420		NT		3920	D	101		2540		NT		1870		483		83.4		83.3		122		NT		3330	
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																												
Aroclor 1248	~	~	0.0335	U	3.15	U	36	D	0.0297	U	1.2		0.0335	U	0.0287	U	NT		NT		NT		NT		NT		0.0321	U	0.167	U
Aroclor 1254	~	~	0.243		151	D	1.6	U	1.26		0.0267	U	0.471		0.0287	U	NT		NT		NT		NT		NT		0.389		4.8	D
Aroclor 1260	~	~	0.125		3.15	U	1.6	U	0.338		0.156		0.545		0.0609		NT		NT		NT		NT		NT		0.17		0.167	U
Aroclor 1262	~	~	0.0335	U	20.4	D	3.94	D	0.0297	U	0.0267	U	0.0335	U	0.0287	U	NT		NT		NT		NT		NT		0.0321	U	0.167	U
Aroclor 1268	~	~	0.0335	U	3.15	U	1.6	U	0.0297	U	0.0267	U	0.0335	U	0.0287	U	NT		NT		NT		NT		NT		0.0321	U	3.92	D
Total PCBs	1	~	0.368		172	D	40	D	1.6		1.35	1	1.02		0.0609		NT		NT		NT		NT		NT		0.559		8.72	D

NOTES:
Only analytes with detections are shown in table
~ = Indicates no regulatory limit has been established for this analyte
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Bold indicates an exceedance of the Pollutant Mobility Criteria
Shaded indicates an exceedance of the Residential Direct Exposure Criteria
Italics indicates laboratory reporting limits above CTDEEP criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 17 April 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 6A
October 2018 Soil Boring Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Depth (feet)/Parent Sample Sampling Date Sample Matrix	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-58_2-3 2-3 10/16/2018 Soil		SS-61_1-2 1-2 10/16/2018 Soil		SS-61_2-3 2-3 10/16/2018 Soil		SS-61_3-4 3-4 10/16/2018 Soil		SS-61_4-5 4-5 10/16/2018 Soil		SS-81_1-2 1-2 10/16/2018 Soil		SS-81_2-3 2-3 10/16/2018 Soil		SS-81_3-4 3-4 10/16/2018 Soil		SS-86_1-2 1-2 10/15/2018 Soil		SS-86_2-2.5 2-2.5 10/15/2018 Soil		SS-86_2.5-3 2.5-3 10/15/2018 Soil		SS-95_1-2 1-2 10/16/2018 Soil		SS-96_1-2 1-2 10/16/2018 Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds (VOCs)	mg/kg	mg/kg																											
1,2-Dibromoethane	0.007	0.1	NT		0.0049	U	NT		NT		NT		0.0058	U	NT		NT		*0.73*	U	NT		NT		NT		NT	
Acetone	500	140	NT		0.0099	U	NT		NT		NT		0.03		NT		NT		1.5	U	NT		NT		NT		NT	
cis-1,2-Dichloroethylene	~	~	NT		0.0049	U	NT		NT		NT		0.14		NT		NT		6.5	D	NT		NT		NT		NT	
Tetrachloroethylene	12	1	NT		0.0049	U	NT		NT		NT		0.14		NT		NT		**2.7**	D	NT		NT		NT		NT	
Toluene	500	67	NT		0.0049	U	NT		NT		NT		0.01		NT		NT		0.73	U	NT		NT		NT		NT	
trans-1,2-Dichloroethylene	~	20	NT		0.0049	U	NT		NT		NT		0.079		NT		NT		7.1	D	NT		NT		NT		NT	
Trichloroethylene	56	1	NT		0.025		NT		NT		NT		**7.5**	D	NT		NT		**53**	D	NT		NT		NT		NT	
Vinyl Chloride	0.32	0.4	NT		0.0049	U	NT		NT		NT		0.1		NT		NT		*0.73*	U	NT		NT		NT		NT	
Semi-Volatile Organic Compounds (SVOCs)	mg/kg	mg/kg																											
Acenaphthene	1,000*	84*	2.24	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Anthracene	1000	400	8.69	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Benzo(a)anthracene	1	1	**25.6**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.814	D	NT		NT		NT		NT	
Benzo(a)pyrene	1	1	**24**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.775	D	NT		NT		NT		NT	
Benzo(b)fluoranthene	1	1	**18.8**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.728	D	NT		NT		NT		NT	
Benzo(g,h,i)perylene	8.4*	1*	**12.4**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Benzo(k)fluoranthene	8.4	1	**20.8**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Carbazole	31*	1*	**1.13**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Chrysene	84*	1*	**23.5**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.717	D	NT		NT		NT		NT	
Dibenzofuran	68*	1.4*	0.731	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Fluoranthene	1000	56	51.8	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		1.31	D	NT		NT		NT		NT	
Fluorene	1000	56	2.17	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Indeno(1,2,3-cd)pyrene	1*	1*	**14.1**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Phenanthrene	1000	40	21.6	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		0.693	U	NT		NT		NT		NT	
Pyrene	1000	40	**52.2**	D	0.596	U	NT		NT		NT		0.668	U	NT		NT		1.28	D	NT		NT		NT		NT	
Pesticides	mg/kg	mg/kg																											
4,4'-DDD	1.8*	0.02*	NT		0.00299	U	NT		NT		NT		0.00335	U	NT		NT		**0.0985**	D	NT		NT		NT		NT	
4,4'-DDT	1.8*	0.02*	NT		**0.0233**	D	NT		NT		NT		0.00335	U	NT		NT		**0.0246**	D	NT		NT		NT		NT	
Alachlor	7.7	0.4	NT		0.0942	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Aldrin	0.04*	0.01*	NT		**0.0311**	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
beta-BHC	~	~	NT		0.00299	U	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Chlordane, total	0.49*	0.066*	NT		0.0599	U	NT		NT		NT		*0.0671*	U	NT		NT		*0.0693*	U	NT		NT		NT		NT	
delta-BHC	~	~	NT		0.00609	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Dieldrin	0.038	0.007	0.000612	U	**0.0107**	D	NT		NT		NT		0.00335	U	NT		NT		**0.00916**	D	NT		NT		NT		NT	
Endrin	20*	0.4*	NT		0.0222	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Endrin aldehyde	20*	0.4*	NT		0.0219	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Endrin ketone	20*	0.4*	NT		0.0175	D	NT		NT		NT		0.00335	U	NT		NT		0.0155	D	NT		NT		NT		NT	
gamma-BHC (Lindane)	20	0.04	NT		0.00705	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Heptachlor epoxide	0.067	0.02	NT		**0.0342**	D	NT		NT		NT		0.00335	U	NT		NT		0.00347	U	NT		NT		NT		NT	
Herbicides	Varies	Varies	NT		ND		NT		NT		NT		ND		NT		NT		ND		NT		NT		NT		NT	
Extractable Total Petroleum Hydrocarbons (ETPH)	mg/kg	mg/kg																											
ETPH (Extractable Total Petroleum Hydrocarbons)	500	2500	NT		59.8		NT		NT		NT		156		NT		NT		191		NT		NT		NT		NT	
Metals	mg/kg	mg/L			mg/kg								mg/kg						mg/kg		mg/kg								
Antimony	27	~	NT		7.56		NT		9.41		9.06		16.9		NT		2.68	U	58.5		3.35	U	2.84	U	NT		NT	
Arsenic	10	~	16.6		17.1		16.9		29.7		15		22.8		15.8		5.53		18.2		8.31		2.8		NT		NT	
Barium	4700	~	NT		1120		NT		1120		1300		2310		NT		473		1990		1320		140		NT		NT	
Cadmium	34	~	NT		23.4		NT		13.1		8.01		19.8		NT		1.72		38.9		8.58		0.586		NT		NT	
Chromium	4000	~	NT		317		NT		109		116		237		NT		136		3220		271		86.1		NT		NT	
Copper	2500	~	NT		949		NT		1180		571		2290		NT		132		2600		502		27.3		NT		NT	
Lead	400	~	1250		1760		2260		2650		2100		3010		13700		1230		3440		1720		17.4		NT		NT	
Mercury	20	~	NT		0.698		NT		1.35		0.99		1.52		NT		0.112		0.778		0.552		0.0341	U	NT		NT	
Nickel	1400	~	NT		212		NT		124		101		206		NT		149		1080		148		41		NT		NT	
Silver	340	~	NT		6.94		NT		4.06		0.624	U	106		NT		0.536	U	59.9		0.67	U	0.568	U	NT		NT	
Vanadium	470	~	NT		98.3		NT		127		140		120		NT		80.4		143		154		55.3		NT		NT	
Zinc	20000	~	NT		1990		NT		4000	D	2220		6380	D	NT		273		3460		1740		53		NT		NT	
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																											
Aroclor 1248	~	~	0.35		0.0299	U	NT		NT		NT		0.0335	U	NT		NT		0.0347	U	NT		NT		0.0307	U	0.0309	U
Aroclor 1254	~	~	0.0306	U	0.155		NT		NT		NT		0.238		NT		NT		0.112		NT		NT		0.315		0.2	
Aroclor 1260	~	~	0.0306	U	0.0299	U	NT		NT		NT		0.0335	U	NT		NT		0.0817		NT		NT		0.0307	U	0.0309	U
Aroclor 1262	~	~	0.281		0.0299	U	NT		NT		NT		0.443		NT		NT		0.0347	U	NT		NT		0.201		0.0309	U
Aroclor 1268	~	~	0.0306	U	0.0655		NT		NT		NT		0.0335	U	NT		NT		0.0347	U	NT		NT		0.0307	U	3.07	D
Total PCBs	1	~	0.631		0.221		NT		NT		NT		0.681		NT		NT		0.194		NT		NT		0.516		3.3	

NOTES:
Only analytes with detections are shown in table
~ = Indicates no regulatory limit has been established for this analyte
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Bold indicates an exceedance of the Pollutant Mobility Criteria
Shaded indicates an exceedance of the Residential Direct Exposure Criteria
Italics indicates laboratory reporting limits above CTDEEP criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 17 April 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 6A
October 2018 Soil Boring Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Sampling Depth (feet)/Parent Sample Sampling Date Sample Matrix	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SS-96_2-3 2-3 10/16/2018 Soil		SS-103_1-2 1-2 10/16/2018 Soil		SS-103_2-3 2-3 10/16/2018 Soil		SS-103_3-4 3-4 10/16/2018 Soil		SS-103_4-5 4-5 10/16/2018 Soil		SS-103_5-6 5-6 10/16/2018 Soil		SS-104_1-2 1-2 10/16/2018 Soil		SS-104_2-3 2-3 10/16/2018 Soil		SS-105_1-2 1-2 10/16/2018 Soil		DUP_1 SS-105_1-2 10/16/2018 Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds (VOCs)	mg/kg	mg/kg																				
1,2-Dibromoethane	0.007	0.1	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Acetone	500	140	NT		NT		NT		NT		NT		NT		NT		NT		0.011	U	0.021	
cis-1,2-Dichloroethylene	~	~	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Tetrachloroethylene	12	1	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Toluene	500	67	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
trans-1,2-Dichloroethylene	~	20	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Trichloroethylene	56	1	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Vinyl Chloride	0.32	0.4	NT		NT		NT		NT		NT		NT		NT		NT		0.0056	U	0.0054	U
Semi-Volatile Organic Compounds (SVOCs)	mg/kg	mg/kg																				
Acenaphthene	1,000*	84*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Anthracene	1000	400	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(a)anthracene	1	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(a)pyrene	1	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(b)fluoranthene	1	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(g,h,i)perylene	8.4*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Benzo(k)fluoranthene	8.4	1	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Carbazole	31*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Chrysene	84*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Dibenzofuran	68*	1.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Fluoranthene	1000	56	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Fluorene	1000	56	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Indeno(1,2,3-cd)pyrene	1*	1*	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Phenanthrene	1000	40	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Pyrene	1000	40	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.541	U
Pesticides	mg/kg	mg/kg																				
4,4'-DDD	1.8*	0.02*	NT		NT		NT		NT		NT		NT		NT		NT		0.00703	D	0.00272	U
4,4'-DDT	1.8*	0.02*	NT		NT		NT		NT		NT		NT		NT		NT		0.00374	D	0.00272	U
Alachlor	7.7	0.4	NT		NT		NT		NT		NT		NT		NT		NT		0.0187	D	0.00272	U
Aldrin	0.04*	0.01*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
beta-BHC	~	~	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Chlordane, total	0.49*	0.066*	NT		NT		NT		NT		NT		NT		NT		NT		0.0562	U	0.0544	U
delta-BHC	~	~	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Dieldrin	0.038	0.007	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Endrin	20*	0.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Endrin aldehyde	20*	0.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Endrin ketone	20*	0.4*	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
gamma-BHC (Lindane)	20	0.04	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Heptachlor epoxide	0.067	0.02	NT		NT		NT		NT		NT		NT		NT		NT		0.00281	U	0.00272	U
Herbicides	Varies	Varies	NT		NT		NT		NT		NT		NT		NT		NT		ND		ND	
Extractable Total Petroleum Hydrocarbons (ETPH)	mg/kg	mg/kg																				
ETPH (Extractable Total Petroleum Hydrocarbons)	500	2500	NT		NT		NT		NT		NT		NT		NT		NT		44.5	U	43.5	U
Metals	mg/kg	mg/L																	mg/kg		mg/kg	
Antimony	27	~	NT		NT		NT		NT		NT		NT		NT		NT		2.81	U	2.72	U
Arsenic	10	~	NT		NT		NT		NT		NT		NT		NT		NT		6.97		5.85	
Barium	4700	~	NT		NT		NT		NT		NT		NT		NT		NT		483		441	
Cadmium	34	~	NT		NT		NT		NT		NT		NT		NT		NT		1.95		1.31	
Chromium	4000	~	NT		NT		NT		NT		NT		NT		NT		NT		166		157	
Copper	2500	~	NT		NT		NT		NT		NT		NT		NT		NT		116		103	
Lead	400	~	NT		NT		NT		NT		NT		NT		NT		NT		99.7		111	
Mercury	20	~	NT		NT		NT		NT		NT		NT		NT		NT		0.0337	U	0.0419	
Nickel	1400	~	NT		NT		NT		NT		NT		NT		NT		NT		90.7		89.2	
Silver	340	~	NT		NT		NT		NT		NT		NT		NT		NT		0.562	U	0.544	U
Vanadium	470	~	NT		NT		NT		NT		NT		NT		NT		NT		95.4		90	
Zinc	20000	~	NT		NT		NT		NT		NT		NT		NT		NT		293		368	
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																				
Aroclor 1248	~	~	0.0262	U	0.0329	U	1.56	D	0.0251	U	0.0287	U	0.0303	U	0.149	U	0.0296	U	0.0281	U	0.0272	U
Aroclor 1254	~	~	0.0262	U	1.36		0.0614	U	0.0251	U	0.0287	U	0.137		5.08	D	0.0296	U	0.0633		0.0272	U
Aroclor 1260	~	~	0.0262	U	0.0329	U	0.0614	U	0.0251	U	0.0287	U	0.115		0.149	U	0.0296	U	0.0281	U	0.0272	U
Aroclor 1262	~	~	0.0262	U	1.12		1.34	D	0.0251	U	0.0287	U	0.0303	U	0.149	U	0.0296	U	0.0281	U	0.0272	U
Aroclor 1268	~	~	0.0262	U	0.0329	U	0.0614	U	0.0251	U	0.0287	U	0.0303	U	0.149	U	0.0296	U	0.0281	U	0.0272	U
Total PCBs	1	~	0.0262	U	2.48		2.9	D	0.0251	U	0.0287	U	0.251		5.08	D	0.0296	U	0.0633		0.0272	U

NOTES:
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mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Bold indicates an exceedance of the Pollutant Mobility Criteria
Shaded indicates an exceedance of the Residential Direct Exposure Criteria
Italics indicates laboratory reporting limits above CTDEEP criteria

* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 17 April 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Table 6B
October 2018 Hand Auger Soil Sampling Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-1_0-0.25		HA-SS-1_0.5-1		HA-SS-1_1-1.5		HA-SS-2_0-0.25		HA-SS-2_0.5-1		HA-SS-2_1-1.5		HA-SS-3_0-0.25		HA-SS-3_0.5-1		HA-SS-3_1-1.5		HA-SS-4_0-0.25		HA-SS-4_0.5-1		HA-SS-4_1-1.5		HA-SS-5_0-0.25		HA-SS-5_0.5-1		HA-SS-5_1-1.5	
Sampling Depth (feet)/Parent Sample			0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1.-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5	
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Aroclor 1248	~	~	0.0326	U	0.033	U	0.0328	U	0.0322	U	0.0305	U	0.0323	U	0.0321	U	0.0336	U	0.0325	U	0.0348	U	0.0327	U	0.0353	U	0.0287	U	0.862		0.461	
Aroclor 1254	~	~	0.0326	U	0.451		0.96		0.0322	U	0.0305	U	0.0323	U	0.047		0.237		4.8	D	0.0348	U	0.0327	U	0.0353	U	0.0532		0.0339	U	0.0298	U
Aroclor 1260	~	~	0.0326	U	0.033	U	0.0328	U	0.0322	U	0.0305	U	0.0598		0.0321	U	0.0336	U	0.0325	U	0.0348	U	0.0327	U	0.131		0.0287	U	0.409		0.271	
Aroclor 1262	~	~	0.0326	U	0.182		0.394		0.0322	U	0.0305	U	0.0323	U	0.0321		0.238		1.24		0.0348	U	0.0327	U	0.0353	U	0.0287	U	0.0339	U	0.0298	U
Aroclor 1268	~	~	0.0326	U	0.033	U	0.0328	U	0.0322	U	0.0305	U	0.0323	U	0.0321	U	0.0336	U	0.0325	U	0.0348	U	0.0327	U	0.0353	U	0.0335		0.0339	U	0.0298	U
Total PCBs	1	~	0.0326	U	0.633		1.35		0.0322	U	0.0305	U	0.0598		0.0792		0.475		1.24		0.0348	U	0.0327	U	0.131		0.0867		1.27		0.732	

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-6_0-0.25		HA-SS-6_0.5-1		HA-SS-6_1-1.5		HA-SS-7_0-0.25		HA-SS-7_0.5-1		HA-SS-7_1-1.5		HA-SS-8_0-0.25		HA-SS-8_0.5-1		HA-SS-8_1-1.5		HA-SS-9_0-0.25		HA-SS-9_0.5-1		HA-SS-9_1-1.5		HA-SS-10_0-0.25		HA-SS-10_0.5-1		HA-SS-10_1-1.5	
Sampling Depth (feet)/Parent Sample			0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5	
Sampling Date			10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018		10/17/2018		10/17/2018		10/17/2018		10/15/2018		10/15/2018		10/15/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Aroclor 1248	~	~	0.0341	U	0.0315	U	0.0302	U	0.0844		0.459		0.821		0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.312		0.486		0.0348	U	0.0346	U	0.0328	U
Aroclor 1254	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.0318	U	0.0269	U	0.0328	U	0.0323	U	0.211		0.0272	U	0.0372	U	0.0332	U	0.0348	U	0.0346	U	0.0328	U
Aroclor 1260	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.162		0.296		0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.124		0.279		0.0348	U	0.0346	U	0.192	
Aroclor 1262	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.0318	U	0.0269	U	0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.0372	U	0.0332	U	0.0348	U	0.0346	U	0.0328	U
Aroclor 1268	~	~	0.0341	U	0.0315	U	0.0302	U	0.0278	U	0.0318	U	0.0269	U	0.0328	U	0.0323	U	0.0337	U	0.0272	U	0.0372	U	0.0332	U	0.0348	U	0.0346	U	0.0328	U
Total PCBs	1	~	0.0341	U	0.0315	U	0.0302	U	0.0844		0.621		1.12		0.0328	U	0.0323	U	0.211		0.0272	U	0.436		0.765		0.0348	U	0.0346	U	0.192	

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-11_0-0.25		HA-SS-11_0.5-1		HA-SS-11_1-1.5		Dup-2 HA-SS-11_1-1.5		HA-SS-12_0-0.25		HA-SS-12_0.5-1		HA-SS-12_1-1.5		HA-SS-13_0-0.25		HA-SS-13_0.5-1		HA-SS-13_1-1.5		HA-SS-14_0-0.25		HA-SS-14_0.5-1		HA-SS-14_1-1.5		HA-SS-15_0-0.25		HA-SS-15_0.5-1	
Sampling Depth (feet)/Parent Sample			0-0.25		0.5-1		1-1.5		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1	
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		10		1		5		1		1		10		1		1		10		1		1		1		1		1	
Aroclor 1248	~	~	0.823		8.31	D	1.55		2.75	D	0.165		0.594		6.08	D	0.249		0.629		6.5	D	0.118		0.141		0.0548		0.384		0.578	
Aroclor 1254	~	~	0.0309	U	0.328	U	0.0334	U	0.159	U	0.0314	U	0.0351	U	0.302	U	0.03	U	0.0384	U	0.317	U	0.0322	U	0.0378	U	0.0327	U	0.0317	U	0.0306	U
Aroclor 1260	~	~	0.155		1.77	D	0.46		0.654	D	0.0538		0.107		1.08	D	0.0488		0.063		0.894	D	0.0322	U	0.0378	U	0.0327	U	0.0994		0.11	
Aroclor 1262	~	~	0.0309	U	0.328	U	0.0334	U	0.159	U	0.0314	U	0.0351	U	0.302	U	0.03	U	0.0384	U	0.317	U	0.0322	U	0.0378	U	0.0327	U	0.0317	U	0.0306	U
Aroclor 1268	~	~	0.0309	U	0.328	U	0.0334	U	0.159	U	0.0314	U	0.0351	U	0.302	U	0.03	U	0.0384	U	0.317	U	0.0322	U	0.0378	U	0.0327	U	0.0317	U	0.0306	U
Total PCBs	1	~	0.978		10.1	D	2.01		3.4	D	0.218		0.702		7.16	D	0.298		0.692		7.4	D	0.118		0.141		0.0548		0.484		0.688	

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-15_1-1.5		HA-SS-16_0-0.25		HA-SS-16_0.5-1		HA-SS-16_1-1.5		HA-SS-17_0-0.25		HA-SS-17_0.5-1		HA-SS-17_1-1.5		Dup-3 HA-SS-17_1-1.5		HA-SS-18_0-0.25		HA-SS-18_0.5-1		HA-SS-18_1-1.5		HA-SS-19_0-0.25		HA-SS-19_0.5-1		HA-SS-19_1-1.5		HA-SS-20_0-0.25	
Sampling Depth (feet)/Parent Sample			1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25	
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Aroclor 1248	~	~	0.234		0.146		0.0806		0.115		0.329		0.575		0.23		0.249		0.0341		0.112		1.1		0.032	U	0.12		0.81		0.0317	U
Aroclor 1254	~	~	0.0309	U	0.0303	U	0.0316	U	0.0328	U	0.0304	U	0.0364	U	0.0284	U	0.0332	U	0.0324	U	0.0327	U	0.0341	U	0.032	U	0.0318	U	0.0364	U	0.0317	U
Aroclor 1260	~	~	0.0476		0.0599		0.0316	U	0.0384		0.149		0.171		0.174		0.195		0.0324	U	0.0754		0.284		0.032	U	0.0452		0.298		0.0317	U
Aroclor 1262	~	~	0.0309	U	0.0303	U	0.0316	U	0.0328	U	0.0304	U	0.0364	U	0.0284	U	0.0332	U	0.0324	U	0.0327	U	0.0341	U	0.032	U	0.0318	U	0.0364	U	0.0317	U
Aroclor 1268	~	~	0.0309	U	0.0303	U	0.0316	U	0.0328	U	0.0304	U	0.0364	U	0.0284	U	0.0332	U	0.0324	U	0.0327	U	0.0341	U	0.032	U	0.0318	U	0.0364	U	0.0317	U
Total PCBs	1	~	0.282		0.206		0.0806		0.154		0.478		0.745		0.404		0.444		0.0341		0.187		1.39		0.032	U	0.165		1.11		0.0317	U

Sample ID	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	HA-SS-20_0.5-1		HA-SS-20_1-1.5		HA-SS-21_0-0.25		HA-SS-21_0.5-1		HA-SS-21_1-1.5		HA-SS-22_0-0.25		HA-SS-22_0.5-1		HA-SS-22_1-1.5		HA-SS-23_0-0.25		HA-SS-23_0.5-1		HA-SS-23_1-1.5		HA-SS-24_0-0.25		HA-SS-24_0.5-1		HA-SS-24_1-1.5		Dup-4 18J0945-32	
Sampling Depth (feet)/Parent Sample			0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		0-0.25		0.5-1		1-1.5		
Sampling Date			10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018		10/17/2018	
Sample Matrix			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Polychlorinated Biphenyls (PCBs)	mg/kg	mg/L																														
Dilution Factor			1		1		1		1		1		1		1		2		1		1		1		1		1		1		1	
Aroclor 1248	~	~	0.0318	U	0.369		0.0379	U	0.0337	U	0.0347	U	0.033	U	**0.0478**		2.62	D	0.0366	U	0.0318	U	0.149		0.0337	U	0.0377	U	0.168		0.0942	
Aroclor 1254	~	~	0.0318	U	0.0286	U	0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0612	U	0.0366	U	0.0318	U	0.0308	U	0.0337	U	0.0377	U	0.0319	U	0.0367	U
Aroclor 1260	~	~	0.0318	U	0.103		0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0876	D	0.0366	U	0.0318	U	0.0549		0.0337	U	0.0377	U	0.294		0.111	
Aroclor 1262	~	~	0.0318	U	0.0286	U	0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0612	U	0.0366	U	0.0318	U	0.0308	U	0.0337	U	0.0377	U	0.0319	U	0.0367	U
Aroclor 1268	~	~	0.0318	U	0.0286	U	0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0317	U	0.0612	U	0.0366	U	0.0318	U	0.0308	U	0.0337	U	0.0377	U	0.0319	U	0.0367	U
Total PCBs	1	~	0.0318	U	0.472		0.0379	U	0.0337	U	0.0347	U	0.033	U	0.0478		2.71	D	0.0366	U	0.0318	U	0.204		0.0337	U	0.0377	U	0.461		0.205	

NOTES:
D = Result is from an analysis that required a dilution
ND = Non-detect
ND* = Laboratory reporting limit above CTDEEP RSR criteria
~ = Indicates no regulatory limit has been established for this analyte
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Shaded indicates an exceedance of the Residential Direct Exposure

Table 6C
October 2018 Groundwater Analytical Results
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148201

Sample ID Parent Sample Sampling Date Client Matrix	Surface-Water Protection Criteria	Residential Groundwater Volatilization Criteria	MW-1 10/30/2018 Groundwater		MW-2 10/30/2018 Groundwater		MW-3 10/30/2018 Groundwater		DUP-01 MW-3 10/30/2018 Groundwater		MW-4 10/30/2018 Groundwater	
Compound			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
VOCs (ug/L)												
Chloroform	14,100	287	0.53		0.5	U	0.5	U	0.5	U	NT	
cis-1,2-Dichloroethylene	6,200*	~	12		5		15		15		NT	
Tetrachloroethylene	88	1,500	3.5		2.1		3.4		3.4		NT	
trans-1,2-Dichloroethylene	10,000*	~	1.9		3.3		3.7		3.7		NT	
Trichloroethylene	2,340	219	31		43		38		38		NT	
SVOCs (ug/L)												
Total SVOCs	~	~	Varies	U	Varies	U	Varies	U	Varies	U	NT	
Pesticides (ug/L)												
Total Pesticides	~	~	Varies	U	Varies	U	Varies	U	Varies	U	NT	
ETPH (ug/L)												
ETPH (Extractable Total Petroleum Hydrocarbons)	250*	~	122		106		109		98		NT	
Dissolved Metals (ug/L)												
Antimony	86,000	~	1.11	U	1.11	U	1.32		1.23		NT	
Barium	2,200*	~	91.8		93.3		101		105		NT	
Copper	48	~	1.48		1.34		4.27		4.32		NT	
Nickel	880	~	2.55		3.46		1.54		1.38		NT	
Selenium	50	~	2.57		1.11	U	6.52		3.9		NT	
Vanadium	270*	~	1.11	U	1.11	U	2.18		2.13		NT	
Zinc	123	~	11.1		8.59		11.9		7.77		NT	
Herbicides (ug/L)												
Total Herbicides	~	~	5	U	5	U	5	U	5	U	NT	
PCBs (ug/L)												
Total PCBs	0.500	~	0.0526	U	0.0526	U	0.0513	U	0.0513	U	0.1000	U

NOTES:
Only detected analytes are shown on this table
Analysis Performed = VOCs (EPA 8260C), SVOCs (EPA 8270D), Pesticides (8081B), Herbicides (8151A), ETPH (CTETPH), PCBS (8082A), & Metals (6020B)
~ = Indicates no regulatory limit has been established for this analyte
ug/L = Micrograms per liter
NT=this indicates the analyte was not a target for this sample
* = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 20 September 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
you need to check dates

Q is the Qualifier Column with definitions as follows:
D = Result is from an analysis that required a dilution
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U = Analyte not detected at or above the level indicated

Table 7A
September 2020 Soil Analytical Results
1 Western Junior Highway
Greenwich, Connecicut
Langan Project No.: 140147201

Boring ID Sample ID Sampling Date Sampling Depth (feet)	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-201 SB-201(2-3) 9/2/2020 2-3		SB-202 SB-202(1-2) 9/2/2020 1-2		SB-203 SB-203(3-4) 9/2/2020 3-4		SB-204 SB-204(2-3) 9/2/2020 2-3		SB-205 SB-205(4-5) 9/2/2020 4-5		SB-205 DUP-1 (SB-205(4-5)) 9/2/2020 4-5	
Compound			**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
VOCs (mg/kg)														
Acetone	500	140	0.0094		0.0099	U	0.0085	U	0.0092	U	0.0082	U	0.013	
Total Metals (mg/kg)														
Arsenic	10	~	1.79		3.6		1.55		4.22		4.05		4.01	
Barium	4700	~	105		111		334		98.6		141		159	
Cadmium	34	~	0.328	U	0.363		0.639		0.35		0.318	U	0.357	
Chromium, Total	~	~	53.7		29.9		94.5		32.4		62.2		65.3	
Copper	2500	~	18		19.1		47.9		21		19.1		22.3	
Lead	400	~	12.6		46.8		22.8		35.7		16.2		17.8	
Mercury	20	~	0.0417		0.104		0.0306	U	0.0631		0.0415		0.0434	
Nickel	1400	~	28.4		19.1		35.6		22.2		33.5		36.1	
Vanadium	470	~	41.3		35.7		106		34.5		55		54.1	
Zinc	20000	~	40.7		54.3		82.4		63.1		48.9		49.6	

Notes:

1. Soil sample analytical results are compared to the Connecticut Department of Energy and Environmental Protection (CT DEEP) Remediation Standard Regulations (RSRs) (August 2017) and to the CTDEEP Additional Polluting Service (APS) (September 2018).
2. Only detected analytes are shown in the table.
3. ~ = Regulatory limit for this analyte does not exist
4. mg/kg = milligrams per kilogram
5. VOC = volatile organic compounds

Qualifiers:
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.

Table 7B
September 2020 Groundwater Analytical Results
1 Western Junior Highway
Greenwich, Connecicut
Langan Project No.: 140147201

Sample ID Sampling Date	Surface Water Protection Criteria	Residential Volatilization Criteria	MW-2 9/17/2020		MW-6 9/17/2020		MW-7 9/17/2020		Dup-01 (MW-7) 9/17/2020	
Compound			Result	Q	Result	Q	Result	Q	Result	Q
VOCs (µg/L)										
Cis-1,2-Dichloroethene	6200*	~	2.4		45		2.4		2.5	
Tetrachloroethene (PCE)	88	1500	2.8		1.1		2.3		2.4	
Trans-1,2-Dichloroethene	10000*	~	2.3		5.2		4.7		4.7	
Trichloroethene (TCE)	2340	219	36		34		46		45	
Total Metals (µg/L)										
Antimony	86000	~	1.11	U	1.11	U	1.5		1.44	
Arsenic	4	~	1.11	U	1.11	U	1.47		1.24	
Barium	2200*	~	113		67.7		154		148	
Chromium, Total	~	~	3.37		1.11	U	7.69		5.68	
Copper	48	~	4.17		1.12		5.85		4.19	
Lead	13	~	1.47		1.11	U	1.79		1.49	
Nickel	880	~	3.13		3.14		5.32		4.59	
Selenium	50	~	1.48		1.11	U	4.07		4.64	
Vanadium	270*	~	2.35		1.11	U	6.66		5.1	
Zinc	123	~	15.2		9.64		11.7		12.8	

Notes:

1. Groundwater sample analytical results are compared to the Connecticut Department of Energy and Environmental Protection (CT DEEP) Remediation Standard Regulations (RSRs) (August 2017) and to the CTDEEP Additional Polluting Service (APS) (September 2018).

2. Only detected analytes are shown in the table.
3. Analysis Performed = VOCs (EPA 8260C), SVOC PAHs (EPA 8270D), Pesticides (8081B), Herbicides (8151A), PCBS (8082A), & Metals (6020B)
4. ~ = Indicates no regulatory limit habeen established for this analyte
5. ug/l = micrograms per liter
6. VOC = volatile organic compound
7. * = For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 20 September 2018) Technical Support Document.

Qualifiers:
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-301A 8/17/2021 1-1.5 ft bg				SB-301B 8/17/2021 5-5.5 ft bg				SB-302A 8/17/2021 2-2.5 ft bg				SB-302B 8/17/2021 6.5-7 ft bg				SB-303A 8/16/2021 2.5-3 ft bg				SB-303B 8/16/2021 5.5-6 ft bg				SB-304A 8/16/2021 1-1.5 ft bg				SB-304B 8/16/2021 2-2.5 ft bg				SB-305A 8/16/2021 1-1.5 ft bg				SB-305B 8/16/2021 3-3.5 ft bg			
				Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																														
Acetone	500	1,000	140	ND	U	0.014	1	ND	U	0.01	1	ND	U	0.0091	1	ND	U	0.0091	1	ND	U	0.017	1	ND	U	0.012	1	ND	U	0.017	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.011	1
Cis-1,2-Dichloroethene	500	1,000	14	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	0.011		0.0084	1	ND	U	0.0058	1	0.012		0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Methyl Ethyl Ketone (2-Butanone)	500	1,000	80	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	ND	U	0.0084	1	ND	U	0.0058	1	ND	U	0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Methylene Chloride	82	760	1	ND	U	0.014	1	ND	U	0.01	1	ND	U	0.0091	1	ND	U	0.0091	1	ND	U	0.017	1	ND	U	0.012	1	ND	U	0.017	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.011	1
Naphthalene	1,000	2,500	56	ND	U	0.014	1	ND	U	0.01	1	ND	U	0.0091	1	ND	U	0.0091	1	ND	U	0.017	1	ND	U	0.012	1	ND	U	0.017	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.011	1
Tetrachloroethene (PCE)	12	110	1	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	ND	U	0.0084	1	ND	U	0.0058	1	0.0087		0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Trans-1,2-Dichloroethene	500	1,000	20	ND	U	0.0071	1	ND	U	0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	ND	U	0.0084	1	ND	U	0.0058	1	ND	U	0.0086	1	ND	U	0.0052	1	ND	U	0.0058	1	ND	U	0.0053	1
Trichloroethene (TCE)	56	520	1	0.027		0.0071	1	0.0054		0.005	1	ND	U	0.0045	1	ND	U	0.0045	1	0.13		0.0084	1	0.097		0.0058	1	0.13		0.0086	1	0.038		0.0052	1	0.023		0.0058	1	ND	U	0.0053	1
Semi-Volatile Organic Compounds (mg/kg)																																														
2-Methylnaphthalene	270	* 1,000	* 5.6	* ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Acenaphthene	1,000	* 2,500	* 84	* ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Acenaphthylene	1,000	2,500	84	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Anthracene	1,000	2,500	400	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(a)anthracene	1	7.8	1	**1.6**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.722		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(a)pyrene	1	1	1	**1.94**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	**1.1**		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(b)fluoranthene	1	7.8	1	**1.59**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.851		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(g,h,i)Perylene	8.4	* 78	* 1	* **1.57**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.924		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Benzo(k)fluoranthene	8.4	78	1	**1.52**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.834		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Chrysene	84	* 780	* 1	* **1.55**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.715		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Dibenz(a,h)anthracene	1	* 1	* 1	* ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Fluoranthene	1,000	2,500	56	3.01		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.991		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Fluorene	1,000	2,500	56	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Indeno(1,2,3-cd)pyrene	1	* 7.8	* 1	* **1.63**		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.936		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Naphthalene	1,000	2,500	56	ND	U	0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Phenanthrene	1,000	2,500	40	1.38		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	ND	U	0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Pyrene	1,000	2,500	40	2.41		0.562	2	ND	U	0.551	2	ND	U	0.536	2	ND	U	0.509	2	ND	U	0.565	2	ND	U	0.519	2	0.886		0.606	2	ND	U	0.553	2	ND	U	0.578	2	ND	U	0.505	2
Pesticides (mg/kg)																																														
4,4'-DDD	NS	NS	NS	0.0119		0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	0.0611		0.00308	5	ND	U	0.00277	5	0.0733		0.00289	5	ND	U	0.00255	5
4,4'-DDE	NS	NS	NS	0.107		0.00274	5	ND	U	0.00276	5	0.0145		0.00271	5	ND	U	0.00253	5	0.0349		0.00281	5	0.0164		0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	0.249		0.00289	5	ND	U	0.00255	5
4,4'-DDT	NS	NS	NS	0.0532		0.00274	5	ND	U	0.00276	5	0.0146		0.00271	5	ND	U	0.00253	5	0.0148		0.00281	5	0.00867		0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	0.237		0.00289	5	ND	U	0.00255	5
DDT (Total)	1.8	* 17	* 0.02	* **0.1721**		0.00274	5	ND	U	0.00276	5	**0.0291**		0.00271	5	ND	U	0.00253	5	**0.0497**		0.00281	5	**0.02507**		0.00256	5	**0.0611**		0.00308	5	ND	U	0.00277	5	**0.5593**		0.00289	5	ND	U	0.00255	5
Alachlor	7.7	72	0.4	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Aldrin	0.04	* 0.34	* 0.01	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	* 3.2	* 0.01	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Alpha Endosulfan	NS	NS	NS	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	* 3.2	* 0.01	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Beta Endosulfan	NS	NS	NS	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Chlordane (alpha and gamma)	0.49	2.2	0.066	ND	U	0.0366	5	ND	U	0.0368	5	ND	U	0.0361	5	ND	U	0.0337	5	**0.0747**		0.0374	5	ND	U	0.0341	5	**0.221**		0.041	5	ND	U	0.0369	5	ND	U	0.0385	5	ND	U	0.034	5
Dieldrin	0.038	0.36	0.007	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Endosulfan Sulfate	NS	NS	NS	ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Endrin	20	610	0.4	* ND	U	0.00274	5	ND	U	0.00276	5	ND	U	0.00271	5	ND	U	0.00253	5	ND	U	0.00281	5	ND	U	0.00256	5	ND	U	0.00308	5	ND	U	0.00277	5	ND	U	0.00289	5	ND	U	0.00255	5
Herbicides (mg/kg)																																														
Total Herbicides	NS	NS	NS	ND	U	0.0227	1	ND	U	0.0219	1	ND	U	0.022	1	ND	U	0.0202	1	ND	U	0.0227	1	ND	U	0.021	1	ND	U	0.0249	1	ND	U	0.0222	1	ND	U	0.0232	1	ND	U	0.0206	1
Polychlorinated Biphenyls (mg/kg)																																														
PCB-1248 (Aroclor 1248)	NS	NS	NS	ND	U	0.0277	1	ND	U	0.0278	1	1		0.0274	1	0.0737		0.0256	1	0.187		0.0284	1	ND	U	0.0258	1	0.934	PCB-I	0.0311	1	ND	U	0.0279	1	9.28		0.292	10	ND	U	0.0258	1
PCB-1260 (Aroclor 1260)	NS	NS	NS	0.153		0.0277	1	ND	U	0.0278	1	0.111		0.0274	1	ND	U	0.0256	1	0.0784		0.0284	1	0.0634		0.0258	1	0.566		0.0311	1	ND	U	0.0279	1	1.68		0.292	10	ND	U	0.0258	1
PCB-1262 (Aroclor 1262)	NS	NS	NS	ND	U	0.0277	1	ND	U	0.0278	1	ND	U	0.0274	1	ND	U	0.0256	1	ND	U	0.0284	1	ND	U	0.0258	1	ND	U	0.0311	1	ND	U	0.0279	1	ND	U	0.292	10	ND	U	0.0258	1
PCB-1268 (Aroclor 1268)	NS	NS	NS	ND	U	0.0277	1	ND	U	0.0278	1	ND	U	0.0274	1	ND	U	0.0256	1	ND	U	0.0284	1	ND	U	0.0258	1	ND	U	0.0311	1	ND	U	0.0279	1	ND	U	0.292	10	ND	U	0.0258	1
Total PCBs	1	10	NS	0.153		0.0277	1	ND	U	0.0278	1	1.11		0.0274	1	0.0737		0.0256	1	0.265		0.0284	1	0.0634		0.0258	1	1.5		0.0311	1	ND	U	0.0279	1	11		0.292	10	ND	U	0.0258	1
Metals (mg/kg)																																														
Antimony	27	8,200	NS	13.7		2.85	1	4.89		2.8	1	4.47		2.76	1	6.77		2.57	1	3.82		2.85	1	ND	U	2.64	1	48.2		3.14	1	3.63		2.81	1	10.9		2.93	1	ND	U	2.6	1
Arsenic	10	10	NS	5.97		1.71	1	ND	U	1.68	1	4.04		1.66	1	2.21		1.54	1	11.9		1.71	1	5.2		1.58	1	32.1		1.88	1	3.83		1.68	1	9.37		1.76	1	ND	U	1.56	1
Barium	4,700	140,000	NS	570		2.85	1	235		2.8	1	286		2.76	1	510		2.57	1	1,000		2.85	1	334		2.64	1	1,210		3.14	1	252		2.81	1	976		2.93	1	86.9		2.6	1
Cadmium	34	1,000	NS	29.2		0.342	1	0.533		0.336	1	0.601		0.331	1	0.614		0.308	1	13.6		0.342	1	0.452		0.316	1	191		0.377	1	1.26		0.337	1	18.7		0.352	1	ND	U	0.312	1
Chromium, Total	NS	NS	NS	523		0.57	1	99		0.56	1	83.9		0.552	1	181		0.514	1	248		0.57	1	138		0.527	1	2,140		0.628	1	117		0.562	1	528		0.587	1	32		0.52	1
Copper	2,500	76,000	NS	252		2.28	1	35.7		2.24	1	46.7		2.21	1	32.7		2.05	1	881		2.28	1	81.7		2.11	1	860		2.51	1	82.5		2.25	1	454		2.35	1	25.2		2.08	1
Lead	400	1,000	NS	428		0.57	1	11.8		0.56	1	260		0.552	1	14.8		0.514	1	943		0.57	1	112		0.527	1	2,220		0.628	1	231		0.562	1	923		0.587	1	3.79		0.52	1
Mercury	20	610	NS	0.406		0.0342	1	ND	U	0.0336	1	0.0445		0.0331	1	ND	U	0.0308	1	0.627		0.0342	1	0.0709		0.0316	1	0.942		0.0377	1	0.0863		0.0337	1	0.786		0.0352	1	ND	U	0.0312	1
Nickel	1,400	7,500	NS	246		1.14	1	48.5		1.12	1	38.7		1.1	1	77.4		1.03	1	200		1.14	1	69.2		1.05	1	1,960		1.26	1	83.9		1.12	1	242		1.17	1	27.4		1.04	1
Silver	340	10,000	NS	1.37		0.57	1	ND	U	0.56	1	ND	U	0.552	1	ND	U	0.514	1	1.69		0.57	1	ND	U	0.527	1	18.2		0.628	1	ND	U	0.562	1	3.62		0.587	1	ND	U	0.52	1
Vanadium	470	14,000	NS	121		1.14	1	71.4		1.12	1	88.4		1.1	1	86.1		1.03	1	102		1.14	1	76.8		1.05	1	352		1.26	1	67.1		1.12	1	119		1.17	1	30.5		1.04	1
Zinc	20,000	610,000	NS	907		2.85	1	58.8		2.8	1	89.4		2.76	1	78.8		2.57	1	2,100		2.85	1	163		2.64	1	2,250		3.14	1	789		2.81	1	1,520		2.93	1	31.1		2.6	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Compos Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-306A 8/16/2021 1-1.5 ft bg				SB-306B 8/16/2021 4-4.5 ft bg				SB-307A 8/17/2021 2-2.5 ft bg				SB-307B 8/17/2021 6-6.5 ft bg				SB-308 8/17/2021 2-3 ft bg				SB-308 DUP-SO1 2-3 ft bg				SB-309A 8/17/2021 2-2.5 ft bg				SB-309B 8/17/2021 3.5-4 ft bg				SB-310A 8/17/2021 1-1.5 ft bg				SB-310B 8/17/2021 3-3.5 ft bg			
							Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																													
Acetone	500		1,000		140		ND	U	0.012	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.0089	1	ND	U	0.011	1	ND	U	0.012	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0059	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0059	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Methylene Chloride	82		760		1		ND	U	0.012	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.0089	1	ND	U	0.011	1	ND	U	0.012	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1
Naphthalene	1,000		2,500		56		ND	U	0.012	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.0089	1	ND	U	0.011	1	ND	U	0.012	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0059	1	ND	U	0.005	1	0.0056		0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0059	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0045	1	ND	U	0.0054	1	ND	U	0.0061	1	ND	U	0.007	1	ND	U	0.0055	1	ND	U	0.0051	1	ND	U	0.0051	1
Trichloroethene (TCE)	56		520		1		0.012		0.0059	1	0.0092		0.005	1	0.044		0.0052	1	ND	U	0.0045	1	0.049		0.0054	1	0.041		0.0061	1	0.038		0.007	1	0.04		0.0055	1	0.024		0.0051	1	ND	U	0.0051	1
Semi-Volatile Organic Compounds (mg/kg)																																													
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Acenaphthylene	1,000		2,500		84		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Anthracene	1,000		2,500		400		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(a)anthracene	1		7.8		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.3**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.568		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(a)pyrene	1		1		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.75**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.68		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.25**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.686		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**1.64**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.21**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Chrysene	84	*	780	*	1	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**2.52**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.572		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.533	2	ND	U	0.514	2+R6	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Fluoranthene	1,000		2,500		56		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	3.94		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.568		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Fluorene	1,000		2,500		56		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	**1.92**		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Naphthalene	1,000		2,500		56		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	ND	U	0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Phenanthrene	1,000		2,500		40		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	1.43		0.564	2	ND	U	0.594	2	ND	U	0.592	2	ND	U	0.528	2	ND	U	0.55	2	ND	U	0.523	2
Pyrene	1,000		2,500		40		ND	U	0.533	2	ND	U	0.514	2	ND	U	0.552	2	ND	U	0.508	2	3.3		0.564	2	ND	U	0.594	2	ND	U	0.592	2	0.546		0.528	2	ND	U	0.55	2	ND	U	0.523	2
Pesticides (mg/kg)																																													
4,4'-DDD	NS		NS		NS		ND	U	0.00265	5	0.00949		0.00258	5	0.127		0.00278	5	ND	U	0.00252	5	0.00692		0.00283	5	ND	U	0.00294	5	0.0245		0.00294	5	ND	U	0.00264	5	0.00845		0.00276	5	ND	U	0.0026	5
4,4'-DDE	NS		NS		NS		0.0149		0.00265	5	0.0333		0.00258	5	0.161		0.00278	5	ND	U	0.00252	5	0.0366		0.00283	5	0.0225		0.00294	5	0.104		0.00294	5	ND	U	0.00264	5	0.0235		0.00276	5	ND	U	0.0026	5
4,4'-DDT	NS		NS		NS		0.0182		0.00265	5	0.0176		0.00258	5	0.371		0.00278	5	ND	U	0.00252	5	0.0278		0.00283	5	0.013		0.00294	5	0.0326		0.00294	5	ND	U	0.00264	5	0.0131		0.00276	5	ND	U	0.0026	5
DDT (Total)	1.8	*	17	*	0.02	*	**0.0331**		0.00265	5	**0.06039**		0.00258	5	**0.659**		0.00278	5	ND	U	0.00252	5	**0.07132**		0.00283	5	**0.0355**		0.00294	5	**0.1611**		0.00294	5	ND	U	0.00264	5	**0.04505**		0.00276	5	ND	U	0.0026	5
Alachlor	7.7		72		0.4		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0354	5	ND	U	0.0344	5	**0.128**		0.0371	5	ND	U	0.0335	5	**0.131**		0.0378	5	ND	U	0.0392	5	**0.301**		0.0392	5	**1.37**		0.0352	5	ND	U	0.0369	5	ND	U	0.0347	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	ND	U	0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	0.00311		0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Endrin	20		610		0.4	*	ND	U	0.00265	5	ND	U	0.00258	5	ND	U	0.00278	5	ND	U	0.00252	5	ND	U	0.00283	5	0.00839		0.00294	5	ND	U	0.00294	5	ND	U	0.00264	5	ND	U	0.00276	5	ND	U	0.0026	5
Herbicides (mg/kg)																																													
Total Herbicides	NS		NS		NS		ND	U	0.0215	1	ND	U	0.0207	1	ND	U	0.0225	1	ND	U	0.0207	1	ND	U	0.0225	1	ND	U	0.0239	1	ND	U	0.0237	1	ND	U	0.0218	1	ND	U	0.0222	1	ND	U	0.0215	1
Polychlorinated Biphenyls (mg/kg)																																													
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.829		0.0268	1	2.57		0.13	5	0.0597		0.0281	1	ND	U	0.0254	1	0.0707		0.0286	1	0.182		0.0297	1	0.945		0.0297	1	10		0.267	10	0.497		0.0279	1	ND	U	0.0263	1
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.211		0.0268	1	0.23		0.13	5	ND	U	0.0281	1	ND	U	0.0254	1	0.0387		0.0286	1	0.0612		0.0297	1	0.246		0.0297	1	1.84		0.267	10	0.135		0.0279	1	ND	U	0.0263	1
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.0268	1	ND	U	0.13	5	ND	U	0.0281	1	ND	U	0.0254	1	ND	U	0.0286	1	ND	U	0.0297	1	ND	U	0.0297	1	ND	U	0.267	10	ND	U	0.0279	1	ND	U	0.0263	1
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0268	1	ND	U	0.13	5	ND	U	0.0281	1	ND	U	0.0254	1	ND	U	0.0286	1	ND	U	0.0297	1	ND	U	0.0297	1	ND	U	0.267	10	ND	U	0.0279	1	ND	U	0.0263	1
Total PCBs	1		10		NS		1.04		0.0268	1	2.8		0.13	5	0.0597		0.0281	1	ND	U	0.0254	1	0.109		0.0286	1	0.244		0.0297	1	1.19		0.0297	1	11.9		0.267	10	0.632		0.0279	1	ND	U	0.0263	1
Metals (mg/kg)																																													
Antimony	27		8,200		NS		4.9		2.69	1	4.8		2.63	1	4.09		2.84	1	5.42		2.6	1	5.14		2.87	1	5.54		3	1	5.41		2.99	1	12.7		2.73	1	5.59		2.81	1	12.5		2.69	1
Arsenic	10		10		NS		5.6		1.62	1	2.83		1.58	1	5.33		1.7	1	3.01		1.56	1	5.03		1.72	1	5.23		1.8	1	9.68		1.79	1	9.68		1.64	1	3.81		1.68	1	ND	U	1.62	1
Barium	4,700		140,000		NS		512		2.69	1	560		2.63	1	578		2.84	1	445		2.6	1	1,340		2.87	1	434		3	1	722		2.99	1	517		2.73	1	231		2.81	1	890		2.69	1
Cadmium	34		1,000		NS		11		0.323	1	4.17		0.316	1	3.33		0.341	1	0.322		0.313	1	3.93		0.345	1	2.37		0.36	1	4.99		0.358	1	17.8		0.328	1	2.04		0.337	1	0.739		0.323	1
Chromium, Total	NS		NS		NS		232		0.538	1	190		0.527	1	74.9		0.568	1	162		0.521	1	138		0.575	1	127		0.6	1	130		0.597	1	452		0.547	1	163		0.561	1	237		0.539	1
Copper	2,500		76,000		NS		301		2.15	1	87.3		2.11	1	462		2.27	1	53.1		2.08	1	243		2.3	1	155		2.4	1	3,580		2.39	1	231		2.19	1	75.4		2.24	1	20		2.15	1
Lead	400		1,000		NS		678		0.538	1	106		0.527	1	1,570		0.568	1	3.68		0.521	1	697		0.575	1	603		0.6	1	1,220		0.597	1	733		0.547	1	206		0.561	1	3.11		0.539	1
Mercury	20		610		NS		0.72		0.0323	1	0.0489		0.0316	1	0.193		0.0341	1	ND	U	0.0313	1	0.471		0.0345	1	0.4		0.036	1	2		0.0358	1	2.42		0.0328	1	1.15		0.0337	1	ND	U	0.0323	1
Nickel	1,400		7,500		NS		112		1.08	1	99.2		1.05	1	48		1.14	1	78.1		1.04	1	60.1		1.15	1	62.4		1.2	1	74.1		1.19	1	143		1.09	1	64.2		1.12	1	92.4		1.08	1
Silver	340		10,000		NS		ND	U	0.538	1	ND	U	0.527	1	ND	U	0.568	1	ND	U	0.521	1	ND	U	0.575	1	ND	U	0.6	1	2.15		0.597	1	1.35		0.547	1	ND	U	0.561	1	ND	U	0.539	1
Vanadium	470		14,000		NS		90.1		1.08	1	95.1		1.05	1	73		1.14	1	97.1		1.04	1	82.8		1.15	1	89.3		1.2	1	69.7		1.19	1	175		1.09	1	45.5		1.12	1	165		1.08	1
Zinc	20,000		610,000		NS		658		2.69	1	345		2.63	1	984		2.84	1	66.1		2.6	1	905		2.87	1	428		3	1	1,490		2.99	1	724		2.73	1	268		2.81	1	99		2.69	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-311A				SB-311B				SB-312A				SB-312B			
							8/17/2021				8/17/2021				8/17/2021				8/17/2021			
							1-2.5 ft bg				5.5-6 ft bg				2-2.5 ft bg				5.5-6 ft bg			
							Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																						
Acetone	500		1,000		140		ND	U	0.015	1	ND	U	0.0089	1	ND	U	0.012	1	ND	U	0.011	1
Cis-1,2-Dichloroethene	500		1,000		14		0.0089		0.0077	1	ND	U	0.0044	1	ND	U	0.0061	1	ND	U	0.0057	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0077	1	ND	U	0.0044	1	ND	U	0.0061	1	ND	U	0.0057	1
Methylene Chloride	82		760		1		ND	U	0.015	1	0.011		0.0089	1	ND	U	0.012	1	ND	U	0.011	1
Naphthalene	1,000		2,500		56		ND	U	0.015	1	ND	U	0.0089	1	ND	U	0.012	1	ND	U	0.011	1
Tetrachloroethene (PCE)	12		110		1		0.012		0.0077	1	ND	U	0.0044	1	0.0083		0.0061	1	ND	U	0.0057	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0077	1	ND	U	0.0044	1	ND	U	0.0061	1	ND	U	0.0057	1
Trichloroethene (TCE)	56		520		1		0.19		0.0077	1	ND	U	0.0044	1	0.034		0.0061	1	0.016		0.0057	1
Semi-Volatile Organic Compounds (mg/kg)																						
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2
Acenaphthylene	1,000		2,500		84		ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2
Anthracene	1,000		2,500		400		ND	U	0.589	2	ND	U	0.519	2	0.679		0.547	2	ND	U	0.569	2
Benzo(a)anthracene	1		7.8		1		ND	U	0.589	2	ND	U	0.519	2	**1.85**		0.547	2	ND	U	0.569	2
Benzo(a)pyrene	1		1		1		ND	U	0.589	2	ND	U	0.519	2	**1.94**		0.547	2	ND	U	0.569	2
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.589	2	ND	U	0.519	2	**1.7**		0.547	2	ND	U	0.569	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.589	2	ND	U	0.519	2	**1.39**		0.547	2	ND	U	0.569	2
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.589	2	ND	U	0.519	2	**1.59**		0.547	2	ND	U	0.569	2
Chrysene	84	*	780	*	1	*	ND	U	0.589	2	ND	U	0.519	2	**1.74**		0.547	2	ND	U	0.569	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2
Fluoranthene	1,000		2,500		56		ND	U	0.589	2	ND	U	0.519	2	4.02		0.547	2	ND	U	0.569	2
Fluorene	1,000		2,500		56		ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.589	2	ND	U	0.519	2	**1.51**		0.547	2	ND	U	0.569	2
Naphthalene	1,000		2,500		56		ND	U	0.589	2	ND	U	0.519	2	ND	U	0.547	2	ND	U	0.569	2
Phenanthrene	1,000		2,500		40		ND	U	0.589	2	ND	U	0.519	2	2.78		0.547	2	ND	U	0.569	2
Pyrene	1,000		2,500		40		ND	U	0.589	2	ND	U	0.519	2	3.11		0.547	2	ND	U	0.569	2
Pesticides (mg/kg)																						
4,4'-DDD	NS		NS		NS		0.0297		0.00296	5	ND	U	0.00262	5	0.0448		0.00273	5	ND	U	0.00287	5
4,4'-DDE	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	0.259		0.00273	5	ND	U	0.00287	5
4,4'-DDT	NS		NS		NS		0.072		0.00296	5	ND	U	0.00262	5	0.201		0.00273	5	ND	U	0.00287	5
DDT (Total)	1.8	*	17	*	0.02	*	**0.1017**		0.00296	5	ND	U	0.00262	5	**0.5048**		0.00273	5	ND	U	0.00287	5
Alachlor	7.7		72		0.4		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		**0.238**		0.0394	5	ND	U	0.0349	5	**1.06**		0.0365	5	ND	U	0.0383	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Endrin	20		610		0.4	*	ND	U	0.00296	5	ND	U	0.00262	5	ND	U	0.00273	5	ND	U	0.00287	5
Herbicides (mg/kg)																						
Total Herbicides	NS		NS		NS		ND	U	0.0243	1	ND	U	0.0209	1	ND	U	0.0217	1	ND	U	0.0232	1
Polychlorinated Biphenyls (mg/kg)																						
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.972		0.0299	1	0.434		0.0265	1	5.74		0.138	5	0.0343		0.029	1
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.17		0.0299	1	ND	U	0.0265	1	0.688		0.138	5	ND	U	0.029	1
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.0299	1	ND	U	0.0265	1	ND	U	0.138	5	ND	U	0.029	1
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0299	1	ND	U	0.0265	1	ND	U	0.138	5	ND	U	0.029	1
Total PCBs	1		10		NS		1.14		0.0299	1	0.434		0.0265	1	6.43		0.138	5	0.0343		0.029	1
Metals (mg/kg)																						
Antimony	27		8,200		NS		29.2		3.05	1	6.27		2.66	1	9.77		2.78	1	5.03		2.94	1
Arsenic	10		10		NS		24.4		1.83	1	2.49		1.6	1	17.8		1.67	1	4.64		1.77	1
Barium	4,700		140,000		NS		3,490		3.05	1	344		2.66	1	1,170		2.78	1	194		2.94	1
Cadmium	34		1,000		NS		12.1		0.366	1	0.447		0.319	1	11		0.333	1	ND	U	0.353	1
Chromium, Total	NS		NS		NS		217		0.609	1	138		0.532	1	288		0.555	1	94.5		0.588	1
Copper	2,500		76,000		NS		829		2.44	1	56.7		2.13	1	926		2.22	1	25.5		2.35	1
Lead	400		1,000		NS		28,100		3.05	5	5.83		0.532	1	2,640		0.555	1	31.6		0.588	1
Mercury	20		610		NS		0.928		0.0366	1	ND	U	0.0319	1	0.785		0.0333	1	0.0638		0.0353	1
Nickel	1,400		7,500		NS		233		1.22	1	58.2		1.06	1	174		1.11	1	50.5		1.18	1
Silver	340		10,000		NS		2.05		0.609	1	ND	U	0.532	1	6.62		0.555	1	ND	U	0.588	1
Vanadium	470		14,000		NS		424		1.22	1	101		1.06	1	93.8		1.11	1	64.6		1.18	1
Zinc	20,000		610,000		NS		5,310		15.2	5	94.5		2.66	1	2,090		2.78	1	63.5		2.94	1

Analyte	SB-313A				SB-313B				SB-314A				SB-314B			
	8/23/2021				8/23/2021				8/17/2021				8/17/2021			
	1-1.5 ft bg				2.5-3 ft bg				0.5-1 ft bg				1.5-2 ft bg			
	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																
Acetone	ND	U	0.0089	1	ND	U	0.0093	1	ND	U	0.014	1	ND	U	0.012	1
Cis-1,2-Dichloroethene	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1
Methyl Ethyl Ketone (2-Butanone)	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1
Methylene Chloride	ND	U	0.0089	1	ND	U	0.0093	1	ND	U	0.014	1	ND	U	0.012	1
Naphthalene	ND	U	0.0089	1	ND	U	0.0093	1	0.014		0.014	1	0.018		0.012	1
Tetrachloroethene (PCE)	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1
Trans-1,2-Dichloroethene	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1
Trichloroethene (TCE)	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0068	1	ND	U	0.0061	1
Semi-Volatile Organic Compounds (mg/kg)																
2-Methylnaphthalene	ND	U	0.577	2	ND	U	0.55	2	1.89		0.548	2	ND	U	0.564	2
Acenaphthene	ND	U	0.577	2	ND	U	0.55	2	ND	U	5.48	20	1.81		0.564	2
Acenaphthylene	ND	U	0.577	2	ND	U	0.55	2	1.01		0.548	2	ND	U	0.564	2
Anthracene	ND	U	0.577	2	ND	U	0.55	2	14.3		5.48	20	5.26		2.82	10
Benzo(a)anthracene	ND	U	0.577	2	ND	U	0.55	2	**21.7**		5.48	20	**8.71**		2.82	10
Benzo(a)pyrene	ND	U	0.577	2	ND	U	0.55	2	**19.3**		5.48	20	**7.51**		2.82	10
Benzo(b)fluoranthene	ND	U	0.577	2	ND	U	0.55	2	**15.6**		5.48	20	**5.89**		2.82	10
Benzo(g,h,i)Perylene	ND	U	0.577	2	ND	U	0.55	2	**10.8**		5.48	20	**4.28**		0.564	2
Benzo(k)fluoranthene	ND	U	0.577	2	ND	U	0.55	2	**15.3**		5.48	20	**6.47**		2.82	10
Chrysene	ND	U	0.577	2	ND	U	0.55	2	**18.8**		5.48	20	**7.45**		2.82	10
Dibenz(a,h)anthracene	ND	U	0.577	2	ND	U	0.55	2	**4.27**		0.548	2	**1.8**		0.564	2
Fluoranthene	ND	U	0.577	2	ND	U	0.55	2	50.6		13.7	50	19.8		2.82	10
Fluorene	ND	U	0.577	2	ND	U	0.55	2	7.41		5.48	20	2.71		0.564	2
Indeno(1,2,3-cd)pyrene	ND	U	0.577	2	ND	U	0.55	2	**12.7**		5.48	20	**5.53**		2.82	10
Naphthalene	ND	U	0.577	2	ND	U	0.55	2	2.48		0.548	2	0.66		0.564	2
Phenanthrene	ND	U	0.577	2	ND	U	0.55	2	**45.9**		13.7	50	17		2.82	10
Pyrene	ND	U	0.577	2	ND	U	0.55	2	36.4		5.48	20	14.6		2.82	10
Pesticides (mg/kg)																
4,4'-DDD	ND	U	0.00289	5	ND	U	0.00278	5	0.0212		0.00271	5	0.0158		0.00281	5
4,4'-DDE	ND	U	0.00289	5	0.0916		0.00278	5	0.128		0.00271	5	ND	U	0.00281	5
4,4'-DDT	ND	U	0.00289	5	0.152		0.00278	5	0.172		0.00271	5	0.156		0.00281	5
DDT (Total)	ND	U	0.00289	5	**0.2436**		0.00278	5	**0.3212**		0.00271	5	**0.1718**		0.00281	5
Alachlor	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Aldrin	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Alpha BHC (Alpha Hexachlorocyclohexane)	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Alpha Endosulfan	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Beta BHC (Beta Hexachlorocyclohexane)	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Beta Endosulfan	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Chlordane (alpha and gamma)	ND	U	0.0385	5	ND	U	0.037	5	ND	U	0.0362	5	ND	U	0.0374	5
Dieldrin	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Endosulfan Sulfate	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Endrin	ND	U	0.00289	5	ND	U	0.00278	5	ND	U	0.00271	5	ND	U	0.00281	5
Herbicides (mg/kg)																
Total Herbicides	ND	U	0.0234	1	ND	U	0.0225	1	ND	U	0.0221	1	ND	U	0.0226	1
Polychlorinated Biphenyls (mg/kg)																
PCB-1248 (Aroclor 1248)	0.253		0.0291	1	7.05		0.281	10	1.77		0.0548	2	1.19		0.0284	1
PCB-1260 (Aroclor 1260)	0.0433		0.0291	1	1.24		0.281	10	0.297		0.0548	2	0.227		0.0284	1
PCB-1262 (Aroclor 1262)	ND	U	0.0291	1	ND	U	0.281	10	ND	U	0.0548	2	ND	U	0.0284	1
PCB-1268 (Aroclor 1268)	ND	U	0.0291	1	ND	U	0.281	10	ND	U	0.0548	2	ND	U	0.0284	1
Total PCBs	0.296		0.0291	1	8.29		0.281	10	2.07		0.0548	2	1.42		0.0284	1
Metals (mg/kg)																
Antimony	ND	U	2.94	1	4.26		2.83	1	6.49		2.8	1	3.42		2.85	1
Arsenic	2.91		1.77	1	5.26		1.7	1	3.14		1.68	1	3.57		1.71	1
Barium	283		2.94	1	384		2.83	1	203		2.8	1	200		2.85	1
Cadmium	0.827		0.353	1	5.54		0.34	1	1.44		0.336	1	1.59		0.342	1
Chromium, Total	73.3		0.589	1	124		0.567	1	131		0.559	1	91.7		0.57	1
Copper	101		2.35	1	570		2.27	1	92.4		2.24	1	144		2.28	1
Lead	57.3		0.589	1	346		0.567	1	152		0.559	1	114		0.57	1
Mercury	0.0558		0.0353	1	0.0782		0.034	1	0.0922		0.0336	1	0.128		0.0342	1
Nickel	53.6		1.18	1	126		1.13	1	65.5		1.12	1	67.7		1.14	1
Silver	ND	U	0.589	1	2.6		0.567	1	ND	U	0.559	1	32.9		0.57	1
Vanadium	62.2		1.18	1	100		1.13	1	82		1.12	1	86.6		1.14	1
Zinc	164		2.94	1	799	B	2.83	1	216		2.8	1	261		2.85	1

Analyte	SB-315A				SB-315A				SB-315B			
	8/23/2021				DUP-SO3				8/23/2021			
	1-1.5 ft bg				1-1.5 ft bg				2-2.5 ft bg			
	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)												
Acetone	ND	U	0.0089	1	ND	U	0.0092	1	ND	U	0.0099	1
Cis-1,2-Dichloroethene	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Methyl Ethyl Ketone (2-Butanone)	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Methylene Chloride	ND	U	0.0089	1	ND	U	0.0092	1	ND	U	0.0099	1
Naphthalene	ND	U	0.0089	1	ND	U	0.0092	1	ND	U	0.0099	1
Tetrachloroethene (PCE)	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Trans-1,2-Dichloroethene	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Trichloroethene (TCE)	ND	U	0.0045	1	ND	U	0.0046	1	ND	U	0.0049	1
Semi-Volatile Organic Compounds (mg/kg)												
2-Methylnaphthalene	ND	U	0.575	2	1.1		0.58	2	ND	U	0.576	2
Acenaphthene	ND	U	0.575	2	1.91		0.58	2	ND	U	0.576	2
Acenaphthylene	ND	U	0.575	2	3.66		0.58	2	ND	U	0.576	2
Anthracene	ND	U	0.575	2	5.86		5.8	20	ND	U	0.576	2
Benzo(a)anthracene	ND	U	0.575	2	**10.8**		5.8	20	ND	U	0.576	2
Benzo(a)pyrene	ND	U	0.575	2	**7.8**		5.8	20	ND	U	0.576	2
Benzo(b)fluoranthene	ND	U	0.575	2	ND	U	5.8	20	ND	U	0.576	2
Benzo(g,h,i)Perylene	ND	U	0.575	2	**4.52**		0.58	2	ND	U	0.576	2
Benzo(k)fluoranthene	ND	U	0.575	2	**6.21**		5.8	20	ND	U	0.576	2
Chrysene	ND	U	0.575	2	**11**		5.8	20	ND	U	0.576	2
Dibenz(a,h)anthracene	ND	U	0.575	2	**1.71**		0.58	2	ND	U	0.576	2
Fluoranthene	ND	U	0.575	2	18.3		5.8	20	ND	U	0.576	2
Fluorene	ND	U	0.575	2	3.49		0.58	2	ND	U	0.576	2
Indeno(1,2,3-cd)pyrene	ND	U	0.575	2	**3.8**		0.58	2	ND	U	0.576	2
Naphthalene	ND	U	0.575	2	2.46		0.58	2	ND	U	0.576	2
Phenanthrene	ND	U	0.575	2	28.3		5.8	20	ND	U	0.576	2
Pyrene	ND	U	0.575	2	26.1		5.8	20	ND	U	0.576	2
Pesticides (mg/kg)												
4,4'-DDD	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
4,4'-DDE	ND	U	0.00287	5	0.102		0.00284	5	ND	U	0.00281	5
4,4'-DDT	ND	U	0.00287	5	0.0704		0.00284	5	ND	U	0.00281	5
DDT (Total)	ND	U	0.00287	5	**0.1724**		0.00284	5	ND	U	0.00281	5
Alachlor	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Aldrin	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Alpha BHC (Alpha Hexachlorocyclohexane)	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Alpha Endosulfan	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Beta BHC (Beta Hexachlorocyclohexane)	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Beta Endosulfan	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Chlordane (alpha and gamma)	ND	U	0.0383	5	ND	U	0.0379	5	ND	U	0.0375	5
Dieldrin	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Endosulfan Sulfate	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Endrin	ND	U	0.00287	5	ND	U	0.00284	5	ND	U	0.00281	5
Herbicides (mg/kg)												
Total Herbicides	ND	U	0.0233	1	ND	U	0.0235	1	ND	U	0.0232	1
Polychlorinated Biphenyls (mg/kg)												
PCB-1248 (Aroclor 1248)	6.22		0.29	10	8.37		0.287	10	3.85		0.284	10
PCB-1260 (Aroclor 1260)	0.457		0.29	10	0.538		0.287	10	0.35		0.284	10
PCB-1262 (Aroclor 1262)	ND	U	0.29	10	ND	U	0.287	10	ND	U	0.284	10
PCB-1268 (Aroclor 1268)	ND	U	0.29	10	ND	U	0.287	10	0.496		0.284	10
Total PCBs	6.68		0.29	10	8.91		0.287	10	4.69		0.284	10
Metals (mg/kg)												
Antimony	ND	U	2.93	1	ND	U	2.96	1	ND	U	2.93	1
Arsenic	2.45		1.76	1	2.66		1.77	1	2.21		1.76	1
Barium	167		2.93	1	174		2.96	1	314		2.93	1
Cadmium	0.639		0.352	1	0.583		0.355	1	1.38		0.351	1
Chromium, Total	80.4		0.586	1	84.3		0.592	1	76.7		0.585	1
Copper	40.5		2.34	1	58.6		2.37	1	119		2.34	1
Lead	32.7		0.586	1	59.8		0.592	1	235		0.585	1
Mercury	ND	U	0.0352	1	0.0648		0.0355	1	0.118		0.0351	1
Nickel	47.8		1.17	1	53.7		1.18	1	80.7		1.17	1
Silver	ND	U	0.586	1	ND	U	0.592	1	ND	U	0.585	1
Vanadium	59.3		1.17	1	58.6		1.18	1	50.7		1.17	1
Zinc	82.1		2.93	1	98.8	B	2.96	1	277		2.93	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-316A 8/23/2021 1-1.5 ft bg					SB-316B 8/23/2021 3-3.5 ft bg					SB-317A 8/18/2021 2-2.5 ft bg					SB-317B 8/18/2021 5.5-6 ft bg					SB-318A 8/23/2021 0.5-1 ft bg					SB-318B 8/23/2021 1-1.5 ft bg					SB-319A 8/23/2021 0.5-1 ft bg					SB-319B 8/23/2021 1-1.5 ft bg					SB-320A 8/23/2021 0.5-1 ft bg					SB-320B 8/23/2021 1-1.5 ft bg				
							Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																																					
Acetone	500		1,000		140		ND	U	0.0098	1		ND	U	0.012	1		ND	U	0.011	1		ND	U	0.0096	1		ND	U	0.0081	1		ND	U	0.0075	1		ND	U	0.013	1		ND	U	0.011	1		ND	U	0.012	1		ND	U	0.011	1
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Methylene Chloride	82		760		1		ND	U	0.0098	1		ND	U	0.012	1		ND	U	0.011	1		ND	U	0.0096	1		ND	U	0.0081	1		ND	U	0.0075	1		ND	U	0.013	1		ND	U	0.011	1		ND	U	0.012	1		ND	U	0.011	1
Naphthalene	1,000		2,500		56		ND	U	0.0098	1		ND	U	0.012	1		ND	U	0.011	1		ND	U	0.0096	1		ND	U	0.0081	1		ND	U	0.0075	1		ND	U	0.013	1		ND	U	0.011	1		ND	U	0.012	1	0.021	SCAL-E15	0.011	1
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0049	1		ND	U	0.0058	1		ND	U	0.0054	1		ND	U	0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		ND	U	0.0055	1
Trichloroethene (TCE)	56		520		1		ND	U	0.0049	1		ND	U	0.0058	1		0.039		0.0054	1		0.012		0.0048	1		ND	U	0.0041	1		ND	U	0.0038	1		ND	U	0.0066	1		ND	U	0.0057	1		ND	U	0.0059	1		0.01		0.0055	1
Semi-Volatile Organic Compounds (mg/kg)																																																					
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Acenaphthylene	1,000		2,500		84		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Anthracene	1,000		2,500		400		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(a)anthracene	1		7.8		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(a)pyrene	1		1		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Chrysene	84	*	780	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Fluoranthene	1,000		2,500		56		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Fluorene	1,000		2,500		56		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Naphthalene	1,000		2,500		56		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Phenanthrene	1,000		2,500		40		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Pyrene	1,000		2,500		40		ND	U	0.602	2		ND	U	0.64	2		ND	U	0.539	2		ND	U	0.521	2		ND	U	0.552	2		ND	U	0.556	2		ND	U	0.61	2		ND	U	0.546	2		ND	U	0.679	2		ND	U	0.581	2
Pesticides (mg/kg)																																																				
4,4'-DDD	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		0.0227		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
4,4'-DDE	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		0.0624		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		0.0652		0.00333	5		ND	U	0.00286	5
4,4'-DDT	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		0.0274		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		0.0496		0.00333	5		ND	U	0.00286	5
DDT (Total)	1.8	*	17	*	0.02	*	ND	U	0.00297	5		ND	U	0.00315	5		**0.1125**		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		**0.1148**		0.00333	5		ND	U	0.00286	5
Alachlor	7.7		72		0.4		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0396	5		ND	U	0.042	5		**0.254**		0.0363	5		**0.0768**		0.0346	5		ND	U	0.0379	5		ND	U	0.0374	5		ND	U	0.0418	5		**1.36**		0.036	5		ND	U	0.0444	5		**0.69**		0.0381	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00297	5		ND	U	0.00315	5		**0.0258**		0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Endrin	20		610		0.4	*	ND	U	0.00297	5		ND	U	0.00315	5		ND	U	0.00272	5		ND	U	0.00259	5		ND	U	0.00284	5		ND	U	0.00281	5		ND	U	0.00314	5		ND	U	0.0027	5		ND	U	0.00333	5		ND	U	0.00286	5
Herbicides (mg/kg)																																																			
Total Herbicides	NS		NS		NS		ND	U	0.0241	1		ND	U	0.0256	1		ND	U	0.0217	1		ND	U	0.0206	1		ND	U	0.0229	1		ND	U	0.0229	1		ND	U	0.0253	1		ND	U	0.0226	1		ND	U	0.0272	1		ND	U	0.0233	1
Polychlorinated Biphenyls (mg/kg)																																																			
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.417		0.03	1		0.326		0.0318	1		1.14		0.0275	1		0.112		0.0262	1		0.802		0.0287	1		0.346		0.0283	1		1.43		0.0317	1		11.6		0.273	10		5.16		0.168	5		7.03		0.289	10
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.0815		0.03	1		0.0553		0.0318	1		0.283		0.0275	1		0.0357		0.0262	1		0.0819		0.0287	1		0.039		0.0283	1		0.092		0.0317	1		1.16		0.273	10		0.396		0.168	5		0.786		0.289	10
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.03	1		ND	U	0.0318	1		ND	U	0.0275	1		ND	U	0.0262	1		ND	U	0.0287	1		ND	U	0.0283	1		ND	U	0.0317	1		ND	U	0.273	10		ND	U	0.168	5		ND	U	0.289	10
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.03	1		ND	U	0.0318	1		ND	U	0.0275	1		ND	U	0.0262	1		ND	U	0.0287	1		ND	U	0.0283	1		ND	U	0.0317	1		ND	U	0.273	10		ND	U	0.168	5		ND	U	0.289	10
Total PCBs	1		10		NS		0.498		0.03	1		0.381		0.0318	1		1.43		0.0275	1		0.147		0.0262	1		0.884		0.0287	1		0.385		0.0283	1		1.52		0.0317	1		12.8		0.273	10		5.56		0.168	5		7.81		0.289	10
Metals (mg/kg)																																																			
Antimony	27		8,200		NS		3.42		3.03	1		ND	U	3.22	1		10.1		2.76	1		3.41		2.63	1		ND	U	2.88	1		ND	U	2.88	1		ND	U	3.18	1		ND	U	2.84	1		4.35		3.43	1		34.4		2.93	1
Arsenic	10		10		NS		3.88		1.82	1		4.06		1.93	1		14		1.66	1		8.16		1.58	1		7.87		1.73	1		25.1		1.73	1		4.1		1.91	1		3.95		1.7	1		7.43		2.06	1		12.7		1.76	1
Barium	4,700		140,000		NS		284		3.03	1		290		3.22	1		1,360		2.76	1		773		2.63	1		126		2.88	1		120		2.88	1		193		3.18	1		301		2.84	1		464		3.43	1		660		2.93	1
Cadmium	34		1,000		NS		1.8		0.363	1		1.21		0.386	1		14.6		0.331	1		1.96		0.316	1		1.81		0.346	1		0.87		0.345	1		1.38		0.382	1		3.85		0.341	1		7.7		0.411	1		9.55		0.352	1
Chromium, Total	NS		NS		NS		88.1		0.605	1		68.6		0.643	1		419		0.552	1		181		0.527	1		47.3		0.576	1		59.7		0.576	1		93.4		0.637	1		118		0.568	1		167		0.686	1		174		0.586	1
Copper	2,500		76,000		NS		135		2.42	1		124		2.57	1		479		2.21	1		155		2.11	1		81.7		2.31	1		55		2.3	1		98		2.55	1		159		2.27	1		300		2.74	1		537		2.35	1
Lead	400		1,000		NS		201		0.605	1		136		0.643	1		2,000	B	0.552	1		519	B	0.527	1		141		0.576	1		62.9		0.576	1		159		0.637	1		232		0.568	1		1,830		0.686	1		5,890		0.586	1
Mercury	20		610		NS		0.11		0.0363	1		0.101		0.0386	1		1.64		0.0331	1		0.0925		0.0316	1		0.1		0.0346	1		0.0483		0.0345	1		0.0995		0.0382	1		0.129		0.0341	1		0.387		0.0411	1		0.583		0.0352	1
Nickel	1,400		7,500		NS		80.4		1.21	1		56.6		1.29	1		167		1.1	1		101		1.05	1		35.7		1.15	1		58.2		1.15	1		51.1		1.27	1		68		1.14	1		103		1.37	1		122		1.17	1
Silver	340		10,000		NS		ND	U	0.605	1		ND	U	0.643	1		1.96		0.552	1		ND	U	0.527	1		ND	U	0.576	1		ND	U	0.576	1		ND	U	0.637	1		ND	U	0.568	1		ND	U	0.686	1		1.06		0.586	1
Vanadium	470		14,000		NS		65.4		1.21	1		53.8		1.29	1		94.6		1.1	1		113		1.05	1		36.9		1.15	1		57.4		1.15	1		65.2		1.27	1		70.5		1.14	1		94		1.37	1		129		1.17	1
Zinc	20,000		610,000		NS		221		3.03	1		162		3.22	1		1,600		2.76	1		436		2.63	1		277	B	2.88	1		172	B	2.88	1		350	B	3.18	1		346	B	2.84	1		789	B	3.43	1		1,160	B	2.93	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-321A 8/18/2021 0.5-1 ft bg						SB-321B 8/18/2021 1.5-2 ft bg						SB-322A 8/18/2021 1-1.5 ft bg						SB-322B 8/18/2021 2.5-3 ft bg						SB-323A 8/18/2021 1.5-2 ft bg						SB-323B 8/18/2021 3-3.5 ft bg						SB-324A 8/18/2021 1-1.5 ft bg						SB-324B 8/18/2021 5-5.5 ft bg						SB-325A 8/18/2021 1-1.5 ft bg						SB-325B 8/18/2021 4.5-5 ft bg					
							Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF			Result	Q	RL	DF		
Volatile Organic Compounds (mg/kg)																																																										
Acetone	500		1,000		140		ND	U	0.013	1			ND	U	0.013	1			ND	U	0.012	1			ND	U	0.0083	1			ND	U	0.01	1			ND	U	0.011	1			ND	U	0.012	1			ND	U	0.0091	1			ND	U	0.01	1			ND	U	0.0091	1		
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			ND	U	0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			ND	U	0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Methylene Chloride	82		760		1		ND	U	0.013	1			ND	U	0.013	1			ND	U	0.012	1			ND	U	0.0083	1			ND	U	0.01	1			ND	U	0.011	1			ND	U	0.012	1			ND	U	0.0091	1			ND	U	0.01	1			ND	U	0.0091	1		
Naphthalene	1,000		2,500		56		ND	U	0.013	1			ND	U	0.013	1			ND	U	0.012	1			ND	U	0.0083	1			ND	U	0.01	1			ND	U	0.011	1			ND	U	0.012	1			ND	U	0.0091	1			ND	U	0.01	1			ND	U	0.0091	1		
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			0.0076		0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			ND	U	0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			ND	U	0.0052	1			ND	U	0.0045	1		
Trichloroethene (TCE)	56		520		1		ND	U	0.0065	1			ND	U	0.0064	1			ND	U	0.0058	1			ND	U	0.0041	1			ND	U	0.0051	1			0.012		0.0057	1			ND	U	0.0059	1			ND	U	0.0046	1			0.021		0.0052	1			0.02		0.0045	1		
Semi-Volatile Organic Compounds (mg/kg)																																																												
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Acenaphthylene	1,000		2,500		84		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Anthracene	1,000		2,500		400		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(a)anthracene	1		7.8		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(a)pyrene	1		1		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			0.621		0.562	2			ND	U	0.535	2		
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Chrysene	84	*	780	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Fluoranthene	1,000		2,500		56		ND	U	0.564	2			0.551		0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			0.853		0.562	2			ND	U	0.535	2		
Fluorene	1,000		2,500		56		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Naphthalene	1,000		2,500		56		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Phenanthrene	1,000		2,500		40		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			ND	U	0.562	2			ND	U	0.535	2		
Pyrene	1,000		2,500		40		ND	U	0.564	2			ND	U	0.545	2			ND	U	0.538	2			ND	U	0.534	2			ND	U	0.53	2			ND	U	0.578	2			ND	U	0.567	2			ND	U	0.554	2			0.675		0.562	2			ND	U	0.535	2		
Pesticides (mg/kg)																																																											
4,4'-DDD	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			0.0177		0.00262	5			0.2		0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			0.0112		0.00271	5			ND	U	0.00264	5		
4,4'-DDE	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			0.126		0.00272	5			ND	U	0.00271	5			0.095		0.00262	5			1.44		0.0142	25			0.0529		0.00279	5			ND	U	0.00279	5			0.0323		0.00271	5			ND	U	0.00264	5		
4,4'-DDT	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			0.0491		0.00272	5			ND	U	0.00271	5			0.0662		0.00262	5			1.01		0.0142	25			0.035		0.00279	5			ND	U	0.00279	5			0.0316		0.00271	5			ND	U	0.00264	5		
DDT (Total)	1.8	*	17	*	0.02	*	ND	U	0.00276	5			ND	U	0.00274	5			**0.1751**		0.00272	5			ND	U	0.00271	5			**0.1789**		0.00262	5			**2.65**		0.0142	25			**0.0879**		0.00279	5			ND	U	0.00279	5			**0.0751**		0.00271	5			ND	U	0.00264	5		
Alachlor	7.7		72		0.4		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Alpha Endosulfan	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Beta Endosulfan	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0368	5			ND	U	0.0365	5			ND	U	0.0362	5			ND	U	0.0361	5			**0.256**		0.035	5			**0.983**		0.19	25			**0.0865**		0.0372	5			ND	U	0.0373	5			**0.0676**		0.0362	5			ND	U	0.0351	5		
Dieldrin	0.038		0.36		0.007		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			**0.0176**		0.00262	5			ND	U	0.0142	25			0.00626		0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Endrin	20		610		0.4	*	ND	U	0.00276	5			ND	U	0.00274	5			ND	U	0.00272	5			ND	U	0.00271	5			ND	U	0.00262	5			ND	U	0.0142	25			ND	U	0.00279	5			ND	U	0.00279	5			ND	U	0.00271	5			ND	U	0.00264	5		
Herbicides (mg/kg)																																																											
Total Herbicides	NS		NS		NS		ND	U	0.0229	1			ND	U	0.022	1			ND	U	0.0219	1			ND	U	0.0218	1			ND	U	0.0214	1			ND	U	0.0233	1			ND	U	0.0228	1			ND	U	0.0224	1			ND	U	0.0224	1			ND	U	0.0215	1		
Polychlorinated Biphenyls (mg/kg)																																																										
PCB-1248 (Aroclor 1248)	NS		NS		NS		47.1		1.4	50			23.9		0.553	20			7.91		0.274	10			33.8		1.37	50			1.72		0.053	2			3.53		0.144	5			0.176		0.0282	1			ND	U	0.0282	1			0.322		0.0274	1			0.245		0.0266	1		
PCB-1260 (Aroclor 1260)	NS		NS		NS		4.01		1.4	50			2.42		0.553	20			0.634		0.274	10			2.79		1.37	50			0.222		0.053	2			1.94		0.144	5			0.0509		0.0282	1			ND	U	0.0282	1			0.193		0.0274	1			0.0439		0.0266	1		
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	1.4	50			ND	U	0.553	20			ND	U	0.274	10			ND	U	1.37	50			ND	U	0.053	2			ND	U	0.144	5			ND	U	0.0282	1			ND	U	0.0282	1			ND	U	0.0274	1			ND	U	0.0266	1		
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	1.4	50			ND	U	0.553	20			ND	U	0.274	10			ND	U	1.37	50			ND	U	0.053	2			ND	U	0.144	5			ND	U	0.0282	1			ND	U	0.0282	1			ND	U	0.0274	1			ND	U	0.0266	1		
Total PCBs	1		10		NS		51.1		1.4	50			26.3		0.553	20			8.54		0.274	10			36.6		1.37	50			1.94		0.053	2			5.46		0.144	5			0.227		0.0282	1			ND	U	0.0282	1			0.515		0.0274	1			0.289		0.0266	1		
Metals (mg/kg)																																																										
Antimony	27		8,200		NS		4.02		2.87	1			3.39		2.79	1			ND	U	2.78	1			4		2.76	1			ND	U	2.69	1			15		2.95	1			ND	U	2.89	1			ND	U	2.85	1			8.51		2.84	1			ND	U	2.73	1		
Arsenic	10		10		NS		7.41		1.72	1			9.74		1.67	1			7.69		1.67	1			11.1		1.66	1			6.18		1.61	1			16.7		1.77	1			6.49		1.73	1			3.83		1.71	1			12.5		1.7	1			5.01		1.64	1		
Barium	4,700		140,000		NS		472		2.87	1			599		2.79	1			231		2.78	1			574		2.76	1			266		2.69	1			1,610		2.95	1			609		2.89	1			77.1		2.85	1			578		2.84	1			304		2.73	1		
Cadmium	34		1,000		NS		8.11		0.345	1			9.35		0.335	1			1.76		0.334	1			10.8		0.331	1			2.25		0.323	1			18.4		0.354	1			4.74		0.347	1			ND	U	0.342	1			4.59		0.34	1			7.42		0.327	1		
Chromium, Total	NS		NS		NS		163		0.575	1			167		0.558	1			85.8		0.557	1			176		0.552	1			105		0.538	1			763		0.59	1			95.8		0.578	1			47.5		0.57	1			343		0.567	1			115		0.546	1		
Copper	2,500		76,000		NS		282		2.3	1			332		2.23	1			74.6		2.23	1			417		2.21	1			82.7		2.15	1			518		2.36	1			423		2.31	1			19.5		2.28	1			397		2.27	1			87.4		2.18	1		
Lead	400		1,000		NS		676	B	0.575	1			808	B	0.558	1			181	B	0.557	1			648	B	0.552	1			154		0.538	1			1,660	B	0.59	1			898		0.578	1			8.2		0.57	1			2,650		0.567	1			128		0.546	1		
Mercury	20		610		NS		0.352		0.0345	1			0.346		0.0335	1			0.11		0.0334	1			0.175		0.0331	1			0.321		0.0323	1			2.94		0.0354	1			0.496		0.0347	1			0.0363		0.0342	1			1.61		0.034	1			0.0739		0.0327	1		
Nickel	1,400		7,500		NS		96.9		1.15	1			102		1.12	1			47.8		1.11	1			103		1.1	1			52.1		1.08	1			322		1.18	1			68.2		1.16	1			25.1		1.14	1			135		1.13	1			70.8		1.09	1		
Silver	340		10,000		NS		ND	U	0.575	1			ND	U	0.558	1			ND	U	0.557	1			0.756		0.552	1			ND	U	0.538	1			4.01		0.59	1			1.05		0.578	1			ND	U	0.57	1			2.73		0.567	1			ND	U	0.546	1		
Vanadium	470		14,000		NS		73.4		1.15	1			81.9		1.12	1			66.4		1.11	1			80.3		1.1	1			67.3		1.08	1			114		1.18	1			83.1		1.16	1			48.8		1.14	1			106		1.13	1			91		1.09	1		
Zinc	20,000		610,000		NS		979		2.87	1			787		2.79	1			210		2.78	1			807		2.76	1			201		2.69	1			1,730		2.95	1			1,050		2.89	1			34.9		2.85	1			722		2.84	1			313		2.73	1		

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-326A 8/18/2021 1.5-2 ft bg				SB-326B 8/18/2021 3-3.5 ft bg				SB-327A 8/18/2021 2-2.5 ft bg				SB-327B 8/18/2021 5-5.5 ft bg				SB-328A 8/18/2021 1-1.5 ft bg				SB-328B 8/18/2021 2.5-3 ft bg				SB-329A 8/18/2021 2-2.5 ft bg				SB-329B 8/18/2021 4-4.5 ft bg				SB-330A 8/18/2021 0.5-1 ft bg				SB-330B 8/18/2021 2-3 ft bg				SB-330B 8/18/2021 DUP-SO2 2-3 ft bg			
							Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF	Result	Q	RL	DF
Volatile Organic Compounds (mg/kg)																																																
Acetone	500		1,000		140		ND	U	0.011	1	ND	U	0.012	1	ND	U	0.013	1	0.052		0.01	1	ND	U	0.0095	1	ND	U	0.012	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.011	1	ND	U	0.0098	1
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0055	1	ND	U	0.0059	1	0.037		0.0066	1	ND	U	0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0055	1	ND	U	0.0059	1	ND	U	0.0066	1	0.0073		0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Methylene Chloride	82		760		1		ND	U	0.011	1	ND	U	0.012	1	ND	U	0.013	1	ND	U	0.01	1	ND	U	0.0095	1	0.046	B	0.012	1	ND	U	0.011	1	0.022	B	0.01	1	ND	U	0.01	1	0.022	B	0.011	1	ND	U	0.0098	1
Naphthalene	1,000		2,500		56		ND	U	0.011	1	ND	U	0.012	1	ND	U	0.013	1	ND	U	0.01	1	ND	U	0.012	1	ND	U	0.0095	1	ND	U	0.011	1	ND	U	0.01	1	ND	U	0.01	1	ND	U	0.011	1	ND	U	0.0098	1
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0055	1	ND	U	0.0059	1	0.026		0.0066	1	ND	U	0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0055	1	ND	U	0.0059	1	0.012		0.0066	1	ND	U	0.005	1	ND	U	0.0047	1	ND	U	0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Trichloroethene (TCE)	56		520		1		ND	U	0.0055	1	0.037		0.0059	1	0.23		0.0066	1	0.03		0.005	1	0.012		0.0047	1	0.0085		0.0059	1	ND	U	0.0053	1	ND	U	0.005	1	ND	U	0.0052	1	ND	U	0.0053	1	ND	U	0.0049	1
Semi-Volatile Organic Compounds (mg/kg)																																																	
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Acenaphthylene	1,000		2,500		84		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Anthracene	1,000		2,500		400		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(a)anthracene	1		7.8		1		0.942		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(a)pyrene	1		1		1		0.807		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(b)fluoranthene	1		7.8		1		0.701		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Benzo(k)fluoranthene	8.4		78		1		0.642		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Chrysene	84	*	780	*	1	*	0.771		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Fluoranthene	1,000		2,500		56		1.8		0.518	2	0.686		0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	0.751		0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Fluorene	1,000		2,500		56		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	0.593		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Naphthalene	1,000		2,500		56		ND	U	0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Phenanthrene	1,000		2,500		40		1.43		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	ND	U	0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Pyrene	1,000		2,500		40		1.38		0.518	2	ND	U	0.531	2	ND	U	0.584	2	ND	U	0.537	2	ND	U	0.528	2	0.654		0.599	2	ND	U	0.559	2	ND	U	0.567	2	ND	U	0.572	2	ND	U	0.603	2	ND	U	0.586	2
Pesticides (mg/kg)																																																	
4,4'-DDD	NS		NS		NS		0.0166		0.00261	5	0.0894		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	0.0713		0.00263	5	0.0282		0.00295	5	0.0507		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
4,4'-DDE	NS		NS		NS		0.0717		0.00261	5	0.375		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	0.317		0.00263	5	0.142		0.00295	5	0.2		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
4,4'-DDT	NS		NS		NS		0.0653		0.00261	5	0.408		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	0.349		0.00263	5	0.158		0.00295	5	0.129		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
DDT (Total)	1.8	*	17	*	0.02	*	**0.1536**		0.00261	5	**0.8724**		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	**0.7373**		0.00263	5	**0.3282**		0.00295	5	**0.3797**		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Alachlor	7.7		72		0.4		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Alpha Endosulfan	NS		NS		NS		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Beta Endosulfan	NS		NS		NS		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Chlordane (alpha and gamma)	0.49		2.2		0.066		ND	U	0.0349	5	**0.619**		0.035	5	**0.189**		0.0393	5	ND	U	0.0354	5	ND	U	0.035	5	ND	U	0.0393	5	**0.454**		0.0369	5	ND	U	0.0376	5	ND	U	0.0377	5	ND	U	0.0408	5	ND	U	0.0395	5
Dieldrin	0.038		0.36		0.007		ND	U	0.00261	5	**0.0397**		0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	**0.0445**		0.00263	5	**0.0211**		0.00295	5	**0.0438**		0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Endrin	20		610		0.4	*	ND	U	0.00261	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00266	5	ND	U	0.00263	5	ND	U	0.00295	5	ND	U	0.00277	5	ND	U	0.00282	5	ND	U	0.00283	5	ND	U	0.00306	5	ND	U	0.00296	5
Herbicides (mg/kg)																																																
Total Herbicides	NS		NS		NS		ND	U	0.0206	1	ND	U	0.0215	1	ND	U	0.0241	1	ND	U	0.0215	1	ND	U	0.0213	1	ND	U	0.0237	1	ND	U	0.022	1	ND	U	0.0228	1	ND	U	0.0225	1	ND	U	0.0249	1	ND	U	0.0239	1
Polychlorinated Biphenyls (mg/kg)																																																
PCB-1248 (Aroclor 1248)	NS		NS		NS		0.374		0.0264	1	2.14		0.133	5	1.24		0.0298	1	ND	U	0.0268	1	1.6		0.0531	2	0.343		0.0298	1	0.834		0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	0.0571		0.0299	1
PCB-1260 (Aroclor 1260)	NS		NS		NS		ND	U	0.0264	1	ND	U	0.0133	5	ND	U	0.0298	1	ND	U	0.0268	1	0.598		0.0531	2	0.122		0.0298	1	0.183		0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	ND	U	0.0299	1
PCB-1262 (Aroclor 1262)	NS		NS		NS		0.363		0.0264	1	1.16		0.133	5	0.804		0.0298	1	ND	U	0.0268	1	ND	U	0.0531	2	ND	U	0.0298	1	ND	U	0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	ND	U	0.0299	1
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0264	1	ND	U	0.133	5	ND	U	0.0298	1	ND	U	0.0268	1	ND	U	0.0531	2	ND	U	0.0298	1	ND	U	0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	ND	U	0.0299	1
Total PCBs	1		10		NS		0.736		0.0264	1	3.3		0.133	5	2.05		0.0298	1	ND	U	0.0268	1	2.19		0.0531	2	0.465		0.0298	1	1.02		0.028	1	ND	U	0.0285	1	ND	U	0.0286	1	ND	U	0.0309	1	0.0571		0.0299	1
Metals (mg/kg)																																																
Antimony	27		8,200		NS		3.23		2.65	1	ND	U	2.69	1	ND	U	3.04	1	ND	U	2.71	1	ND	U	2.73	1	ND	U	3.01	1	ND	U	2.81	1	ND	U	2.89	1	ND	U	2.87	1	ND	U	3.12	1	ND	U	3.02	1
Arsenic	10		10		NS		6.4		1.59	1	53.1		1.62	1	17.5		1.82	1	2.6		1.63	1	14		1.64	1	9.85		1.81	1	4.61		1.69	1	4.67		1.74	1	5.36		1.72	1	6.52		1.87	1	4.84		1.81	1
Barium	4,700		140,000		NS		199		2.65	1	1,370		2.69	1	1,640		3.04	1	616		2.71	1	810		2.73	1	412		3.01	1	180		2.81	1	160		2.89	1	215		2.87	1	173		3.12	1	174		3.02	1
Cadmium	34		1,000		NS		0.906		0.318	1	14.6		0.323	1	8.25		0.365	1	0.439		0.325	1	14.3		0.328	1	5.65		0.361	1	0.472		0.337	1	ND	U	0.347	1	0.468		0.345	1	ND	U	0.375	1	ND	U	0.362	1
Chromium, Total	NS		NS		NS		77.2		0.531	1	219		0.539	1	164		0.608	1	128		0.542	1	287		0.547	1	136		0.602	1	63.3		0.562	1	71.2		0.578	1	97.9		0.575	1	91.9		0.624	1	104		0.604	1
Copper	2,500		76,000		NS		68.9		2.12	1	1,110		2.16	1	938		2.43	1	44.7		2.17	1	483		2.19	1	485		2.41	1	35.7		2.25	1	28.1		2.31	1	31.6		2.3	1	25.8		2.5	1	24.5		2.41	1
Lead	400		1,000		NS		207		0.531	1	2,230		0.539	1	2,020		0.608	1	31.9		0.542	1	701		0.547	1	663		0.602	1	57.5		0.562	1	14		0.578	1	39.4		0.575	1	33.8		0.624	1	18.7	B	0.604	1
Mercury	20		610		NS		0.201		0.0318	1	0.508		0.0323	1	ND	U	0.0365	1	0.0452		0.0325	1	1.4		0.0328	1	ND	U	0.0361	1	0.493		0.0337	1	ND	U	0.0347	1	0.0754		0.0345	1	0.072		0.0375	1	0.0605		0.0362	1
Nickel	1,400		7,500		NS		41.6		1.06	1	215		1.08	1	207		1.22	1	74		1.08	1	169		1.09	1	101		1.2	1	35.4		1.12	1	36.3		1.16	1	49		1.15	1	46.9		1.25	1	50.1		1.21	1
Silver	340		10,000		NS		ND	U	0.531	1	3.09		0.539	1	4		0.608	1	ND	U	0.542	1	ND	U	0.547	1	0.627		0.602	1	ND	U	0.562	1	ND	U	0.578	1	ND	U	0.575	1	ND	U	0.624	1	ND	U	0.604	1
Vanadium	470		14,000		NS		67.9		1.06	1	56.1		1.08	1	82.8		1.22	1	92		1.08	1	111		1.09	1	67		1.2	1	52.8		1.12	1	60		1.16	1	63.6		1.15	1	70.4		1.25	1	74.1		1.21	1
Zinc	20,000		610,000		NS		182		2.65	1	2,970		2.69	1	2,070		3.04	1	114		2.71	1	1,350		2.73	1	620		3.01	1	100		2.81	1	49.1		2.89	1	90.3		2.87	1	69.1		3.12	1	70.6		3.02	1

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 8
August 2021 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria		Industrial/ Commercial Direct Exposure Criteria		GB Pollutant Mobility Criteria		SB-331A 8/18/2021 2-2.5 ft bg					SB-331B 8/18/2021 4-4.5 ft bg					SB-332A 8/18/2021 0.5-1 ft bg					SB-332B 8/18/2021 2-3.5 ft bg				
							Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF		Result	Q	RL	DF	
Volatile Organic Compounds (mg/kg)																										
Acetone	500		1,000		140		ND	U	0.01	1		ND	U	0.0096	1		ND	U	0.0098	1		ND	U	0.011	1	
Cis-1,2-Dichloroethene	500		1,000		14		ND	U	0.0052	1		ND	U	0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Methyl Ethyl Ketone (2-Butanone)	500		1,000		80		ND	U	0.0052	1		ND	U	0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Methylene Chloride	82		760		1		0.028	B	0.01	1		ND	U	0.0096	1		ND	U	0.0098	1		0.013	B	0.011	1	
Naphthalene	1,000		2,500		56		ND	U	0.01	1		ND	U	0.0096	1		ND	U	0.0098	1		ND	U	0.011	1	
Tetrachloroethene (PCE)	12		110		1		ND	U	0.0052	1		0.0059		0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Trans-1,2-Dichloroethene	500		1,000		20		ND	U	0.0052	1		ND	U	0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Trichloroethene (TCE)	56		520		1		0.0063		0.0052	1		0.01		0.0048	1		ND	U	0.0049	1		ND	U	0.0055	1	
Semi-Volatile Organic Compounds (mg/kg)																										
2-Methylnaphthalene	270	*	1,000	*	5.6	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Acenaphthene	1,000	*	2,500	*	84	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Acenaphthylene	1,000		2,500		84		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Anthracene	1,000		2,500		400		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(a)anthracene	1		7.8		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(a)pyrene	1		1		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(b)fluoranthene	1		7.8		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(g,h,i)Perylene	8.4	*	78	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Benzo(k)fluoranthene	8.4		78		1		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Chrysene	84	*	780	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Dibenz(a,h)anthracene	1	*	1	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Fluoranthene	1,000		2,500		56		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Fluorene	1,000		2,500		56		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Indeno(1,2,3-cd)pyrene	1	*	7.8	*	1	*	ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Naphthalene	1,000		2,500		56		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Phenanthrene	1,000		2,500		40		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Pyrene	1,000		2,500		40		ND	U	0.575	2		ND	U	0.543	2		ND	U	0.528	2		ND	U	0.525	2	
Pesticides (mg/kg)																										
4,4'-DDD	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
4,4'-DDE	NS		NS		NS		0.0854		0.00282	5		ND	U	0.00268	5		0.00732		0.00264	5		ND	U	0.00261	5	
4,4'-DDT	NS		NS		NS		0.0317		0.00282	5		ND	U	0.00268	5		0.00994		0.00264	5		ND	U	0.00261	5	
DDT (Total)	1.8	*	17	*	0.02	*	**0.1171**		0.00282	5		ND	U	0.00268	5		0.01726		0.00264	5		ND	U	0.00261	5	
Alachlor	7.7		72		0.4		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Aldrin	0.04	*	0.34	*	0.01	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Alpha BHC (Alpha Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Alpha Endosulfan	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Beta BHC (Beta Hexachlorocyclohexane)	0.34	*	3.2	*	0.01	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Beta Endosulfan	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Chlordane (alpha and gamma)	0.49		2.2		0.066		**0.0863**		0.0376	5		ND	U	0.0357	5		ND	U	0.0352	5		ND	U	0.0348	5	
Dieldrin	0.038		0.36		0.007		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Endosulfan Sulfate	NS		NS		NS		ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Endrin	20		610		0.4	*	ND	U	0.00282	5		ND	U	0.00268	5		ND	U	0.00264	5		ND	U	0.00261	5	
Herbicides (mg/kg)																										
Total Herbicides	NS		NS		NS		ND	U	0.0228	1		ND	U	0.0218	1		ND	U	0.0213	1		ND	U	0.021	1	
Polychlorinated Biphenyls (mg/kg)																										
PCB-1248 (Aroclor 1248)	NS		NS		NS		ND	U	0.0285	1		ND	U	0.027	1		0.369		0.0267	1		0.0378		0.0264	1	
PCB-1260 (Aroclor 1260)	NS		NS		NS		0.0519		0.0285	1		ND	U	0.027	1		0.0671		0.0267	1		ND	U	0.0264	1	
PCB-1262 (Aroclor 1262)	NS		NS		NS		ND	U	0.0285	1		ND	U	0.027	1		ND	U	0.0267	1		ND	U	0.0264	1	
PCB-1268 (Aroclor 1268)	NS		NS		NS		ND	U	0.0285	1		ND	U	0.027	1		ND	U	0.0267	1		ND	U	0.0264	1	
Total PCBs	1		10		NS		0.0519		0.0285	1		ND	U	0.027	1		0.436		0.0267	1		0.0378		0.0264	1	
Metals (mg/kg)																										
Antimony	27		8,200		NS		ND	U	2.89	1		3.28		2.74	1		ND	U	2.68	1		ND	U	2.68	1	
Arsenic	10		10		NS		14.1		1.73	1		7.59		1.65	1		4.09		1.61	1		4.69		1.61	1	
Barium	4,700		140,000		NS		857		2.89	1		453		2.74	1		175		2.68	1		338		2.68	1	
Cadmium	34		1,000		NS		7.82		0.347	1		0.991		0.329	1		0.463		0.322	1		ND	U	0.321	1	
Chromium, Total	NS		NS		NS		115		0.578	1		151		0.549	1		51.9		0.536	1		127		0.535	1	
Copper	2,500		76,000		NS		1,210		2.31	1		134		2.19	1		57.6		2.14	1		48.7		2.14	1	
Lead	400		1,000		NS		1,250		0.578	1		126		0.549	1		50.8		0.536	1		44.7		0.535	1	
Mercury	20		610		NS		2.19		0.0347	1		0.0589		0.0329	1		0.0856		0.0322	1		ND	U	0.0321	1	
Nickel	1,400		7,500		NS		108		1.16	1		77.6		1.1	1		31.4		1.07	1		58.7		1.07	1	
Silver	340		10,000		NS		1.44		0.578	1		ND	U	0.549	1		ND	U	0.536	1		ND	U	0.535	1	
Vanadium	470		14,000		NS		61.2		1.16	1		90		1.1	1		45		1.07	1		93.8		1.07	1	
Zinc	20,000		610,000		NS		1,330		2.89	1		203		2.74	1		97.7		2.68	1		90.4		2.68	1	

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
ND - Not detected
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.
1. Acetone was detected at a concentration of 2.33 µg/L in Trip Blank_2021.08.16.

Qualifiers:
B = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.
PCB-I = PCB calculations are based upon the average response of five peaks for each Aroclor. For this sample, an interference was present and the analyst was unable to use all five peaks.
SCAL-E15 = The value reported is ESTIMATED. The value is estimated due to its behavior during initial calibration (average RfRSD>15%).
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9A
March 2022 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-333	SB-334	SB-335	SB-336	SB-337	SB-338	SB-339	SB-340	DUP-2_021822 / SB-340	SB-341	SB-342	SB-343
				02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022	02/18/2022
				1.5-2	0.75-1.25	0.5-1	0-1	0.5-1	1.25-1.75	0.25-0.75	1-1.5	1-1.5	0.5-1.5	1-2	0-1
				Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (mg/kg)															
1,2-Dibromoethane (Ethylene Dibromide)	0.007	0.067	0.1	<0.0056 U	<0.005 U	<0.012 U	<0.0082 U	<0.0099 U	<0.0057 U	<0.0086 U	<0.0059 U	<0.0063 U	<0.0052 U	<0.0066 U	<0.0081 U
Acetone	500	1000	140	<0.011 UJ	<0.01 UJ	0.033 J	<0.016 UJ	<0.02 UJ	<0.011 UJ	<0.017 UJ	<0.012 UJ	<0.013 UJ	<0.01 UJ	0.046 J	0.017 J
Methylene Chloride	82	760	1	<0.011 U	<0.01 U	0.03	<0.016 U	0.04	<0.011 U	<0.017 U	0.077 J	0.016 J	<0.01 U	0.05	<0.016 U
Trichloroethene (TCE)	56	520	1	<0.0056 U	<0.005 U	<0.012 U	<0.0082 U	<0.0099 U	<0.0057 U	<0.0086 U	<0.0059 U	<0.0063 U	0.01	<0.0066 U	<0.0081 U
Semi-Volatile Organic Compounds (mg/kg)															
Benzo(a)anthracene	1	7.8	1	<0.557 U	**1.38**	<0.685 U	0.711	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(a)pyrene	1	1	1	<0.557 U	**1.06**	<0.685 U	0.899	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(b)fluoranthene	1	7.8	1	<0.557 U	**1.01**	<0.685 U	0.797	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(g,h,i)Perylene	8.4 *	78 *	1 *	<0.557 U	0.658	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Benzo(k)fluoranthene	8.4	78	1	<0.557 U	0.999	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Chrysene	84 *	780 *	1 *	<0.557 U	1.15	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Fluoranthene	1000	2500	56	<0.557 UJ	2.47 J	<0.685 U	1.1	0.803	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Indeno(1,2,3-cd)pyrene	1 *	7.8 *	1 *	<0.557 U	0.831	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Phenanthrene	1000	2500	40	<0.557 UJ	1.59 J	<0.685 U	<0.698 U	<0.688 U	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Pyrene	1000	2500	40	<0.557 U	2.09	<0.685 U	0.842	0.778	<0.593 U	<0.641 U	<0.635 U	<0.624 U	<0.592 U	<0.657 U	<0.65 U
Petroleum Hydrocarbons (mg/kg)															
Total Extractable Petroleum Hydrocarbons	500	2500	2500	<42.1 U	<46.7 U	<54.8 U	71.2	102	<45.7 U	<49.5 U	<48.2 U	65.4	<46 U	<48.5 U	<49.1 U
Pesticides (mg/kg)															
4,4'-DDD	NS	NS	NS	<0.00268 U	<0.0029 U	<0.00336 UJ	0.0473 J	0.0108 J	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
4,4'-DDE	NS	NS	NS	<0.00268 U	<0.0029 U	<0.00336 UJ	0.0134 J	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
4,4'-DDT	1.8 *	17 *	0.02 *	<0.00268 U	<0.0029 U	<0.00336 UJ	0.348 J	0.0619 J	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
Chlordane (alpha and gamma)	0.49	2.2	0.066	<0.0357 U	<0.0387 U	<0.0448 UJ	0.135 J	<0.0452 UJ	<0.039 U	<0.0427 U	<0.0413 U	<0.0416 U	<0.0397 U	<0.0427 U	<0.0431 UJ
Dieldrin	0.038	0.36	0.007	<0.00268 U	<0.0029 U	<0.00336 UJ	<0.00349 UJ	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
Heptachlor	0.14	1.3	0.013	<0.00268 U	<0.0029 U	<0.00336 UJ	<0.00349 UJ	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	<0.00323 UJ
Heptachlor Epoxide	0.067	0.63	0.02	<0.00268 U	<0.0029 U	<0.00336 UJ	<0.00349 UJ	<0.00339 UJ	<0.00292 U	<0.0032 U	<0.0031 U	<0.00312 U	<0.00298 U	<0.00321 U	**0.076 J**
Herbicides (mg/kg)															
Dalapon	NS	NS	NS	0.105	0.0754	0.0731	0.182	0.164	<0.0239 U	0.0927	0.171	0.203	0.123	0.143	0.0936
Polychlorinated Biphenyl (mg/kg)															
PCB-1248 (Aroclor 1248)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	0.8	<0.0342 UJ	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	0.587 J	0.741
PCB-1254 (Aroclor 1254)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	<0.0352 U	0.136 J	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	<0.0324 UJ	<0.0326 U
PCB-1260 (Aroclor 1260)	NS	NS	NS	<0.0271 U	0.0309	<0.0339 UJ	0.25	0.0757 J	<0.0295 U	<0.0323 UJ	0.0513	<0.0315 U	<0.0301 U	0.069 J	0.125 J
PCB-1262 (Aroclor 1262)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	<0.0352 U	<0.0342 UJ	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	<0.0324 UJ	<0.0326 U
PCB-1268 (Aroclor 1268)	NS	NS	NS	<0.0271 U	<0.0293 U	<0.0339 UJ	<0.0352 U	<0.0342 UJ	<0.0295 U	<0.0323 UJ	<0.0313 U	<0.0315 U	<0.0301 U	<0.0324 UJ	<0.0326 U
Total PCBs	1	10	NS	<0.0271 U	0.0309	<0.0339 UJ	**1.05**	0.212 J	<0.0295 U	<0.0323 UJ	0.0513	<0.0315 U	<0.0301 U	0.657 J	0.866
Metals (mg/kg)															
Antimony	27	8200	NS	7.12	11.4	8.59	17.3	21.8	9	8.36	9.91	10.2	9.85	18.5 J	9.29
Arsenic	10	10	NS	<1.69 U	<1.77 U	3.31	8.84	**12.6**	1.88	4.35	6.34	3.16	2.41	3.68	3.06
Barium	4700	140000	NS	207 J	322 J	171	1,430	1,040	99.7	120	247	223	611	1,260 J	204
Cadmium	34	1000	NS	<0.338 U	1.71	0.788	17.5	10.4	<0.36 U	<0.39 U	1.51	1.12	1.99	2.85 J	1.99
Chromium, Total	NS	NS	NS	53.8	110	79	234	217	65.8	54.4	111	106	120	426 J	93.7
Copper	2500	76000	NS	37.7 J	204 J	67.8	1,500	1,740	23.5	47.4	186 J	85.1 J	136	202 J	98.1
Lead	400	1000	NS	51	389	167	**2,800**	**2,000**	9.93	136	269	196	256	**1,570 J**	214
Mercury	20	610	NS	<0.0338 U	0.157	0.186	1.18	0.572	0.0393	0.159	0.915 J	0.29 J	0.217	0.269	0.165
Nickel	1400	7500	NS	32.9 J	60 J	25.9	204	156	20.2	22.1	52.4	46.1	37.7	44.2 J	34.9 J
Silver	340	10000	NS	0.935	<0.699 U	2.35	3.08	1.02	1.8	1.51	1.58	1.67	0.953	<0.661 UJ	1.76
Vanadium	470	14000	NS	57.8	65.1	63.2	180	81	57.7	51.5	68.8	69.6	61.8	67.6	65.8
Zinc	20000	610000	NS	69.3	253	131	2,410	2,060	47.7	134	291	216	308	903 J	275

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting

Qualifiers:
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate or
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9A
March 2022 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	DUP-1_021822 / SB-343 / 02/18/2022 / 0-1	SB-344A / 02/18/2022 / 0.5-1	SB-344B / 02/18/2022 / 1-1.4	SB-345 / 02/18/2022 / 1-2	SB-346 / 02/18/2022 / 0.5-1.5	SB-347 / 02/18/2022 / 0.5-1.25	SB-348 / 02/18/2022 / 1-2	SB-349 / 02/18/2022 / 0.5-1.25	SB-350 / 02/18/2022 / 0.25-0.75	SB-351 / 02/18/2022 / 1-1.5	SB-352A / 02/18/2022 / 0.5-1	SB-352B / 02/18/2022 / 1.25-1.5
				Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (mg/kg)															
1,2-Dibromoethane (Ethylene Dibromide)	0.007	0.067	0.1	<0.0063 U	<0.0068 U	<0.0077 U	<0.0062 U	<0.0067 U	<0.0069 U	<0.007 U	<0.0064 U	<0.0061 U	<0.006 U	<0.0063 U	<0.0049 U
Acetone	500	1000	140	0.02 J	<0.014 UJ	<0.015 UJ	<0.012 UJ	<0.013 UJ	<0.014 UJ	<0.014 UJ	<0.013 UJ	<0.012 UJ	<0.012 UJ	<0.013 UJ	<0.0098 UJ
Methylene Chloride	82	760	1	0.015	0.048	0.044	<0.012 U	<0.013 U	<0.014 U	<0.014 U	<0.013 U	<0.012 U	<0.012 U	<0.013 U	<0.0098 U
Trichloroethene (TCE)	56	520	1	<0.0063 U	<0.0068 U	<0.0077 U	<0.0062 U	<0.0067 U	<0.0069 U	<0.007 U	<0.0064 U	<0.0061 U	<0.006 U	<0.0063 U	<0.0049 U
Semi-Volatile Organic Compounds (mg/kg)															
Benzo(a)anthracene	1	7.8	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.748	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(a)pyrene	1	1	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.832	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(b)fluoranthene	1	7.8	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.745	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(g,h,i)Perylene	8.4 *	78 *	1 *	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	<0.597 U	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Benzo(k)fluoranthene	8.4	78	1	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.739	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Chrysene	84 *	780 *	1 *	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.717	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Fluoranthene	1000	2500	56	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	1.66 J	<0.642 U	<0.66 UJ	<0.638 U	<0.579 UJ	<0.572 UJ
Indeno(1,2,3-cd)pyrene	1 *	7.8 *	1 *	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.636	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Phenanthrene	1000	2500	40	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	0.684 J	<0.642 U	<0.66 UJ	<0.638 U	<0.579 UJ	<0.572 UJ
Pyrene	1000	2500	40	<0.66 U	<0.668 U	<0.671 U	<0.576 U	<0.613 U	<0.642 U	1.26	<0.642 U	<0.66 U	<0.638 U	<0.579 U	<0.572 U
Petroleum Hydrocarbons (mg/kg)															
Total Extractable Petroleum Hydrocarbons	500	2500	2500	<51.5 U	51.9	<53.4 U	97.5	103	117	199	<48.5 U	<50.5 U	<50.3 U	188	73.5
Pesticides (mg/kg)															
4,4'-DDD	NS	NS	NS	<0.00325 U	<0.00331 U	<0.00326 U	<0.00287 U	0.0438	<0.00324 UJ	0.0192	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
4,4'-DDE	NS	NS	NS	<0.00325 U	<0.00331 U	0.0387	0.00646	<0.00305 U	<0.00324 UJ	0.0253	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
4,4'-DDT	1.8 *	17 *	0.02 *	<0.00325 U	0.00501	0.00405	<0.00287 U	0.0578	<0.00324 UJ	0.131	<0.00322 U	<0.0033 U	<0.00316 U	0.00643	<0.00282 U
Chlordane (alpha and gamma)	0.49	2.2	0.066	<0.0433 U	<0.0441 U	<0.0434 U	<0.0382 U	<0.0407 U	<0.0432 UJ	0.219	<0.043 U	<0.044 U	<0.0421 U	0.0419	<0.0376 U
Dieldrin	0.038	0.36	0.007	<0.00325 U	0.0181	0.0164	<0.00287 U	0.015	<0.00324 UJ	<0.00295 U	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
Heptachlor	0.14	1.3	0.013	<0.00325 U	<0.00331 U	0.0367	<0.00287 U	<0.00305 U	<0.00324 UJ	<0.00295 U	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
Heptachlor Epoxide	0.067	0.63	0.02	<0.00325 UJ	<0.00331 U	<0.00326 U	<0.00287 U	<0.00305 U	<0.00324 UJ	0.0141	<0.00322 U	<0.0033 U	<0.00316 U	<0.00289 U	<0.00282 U
Herbicides (mg/kg)															
Dalapon	NS	NS	NS	0.154	0.15	0.135	0.111	0.0431	0.0563	0.123	<0.0258 U	<0.0263 U	0.321	0.327	0.231
Polychlorinated Biphenyl (mg/kg)															
PCB-1248 (Aroclor 1248)	NS	NS	NS	0.708	3.12	3.89 J	0.551	0.458	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1254 (Aroclor 1254)	NS	NS	NS	<0.0328 U	<0.167 U	<0.165 UJ	<0.029 U	<0.0308 U	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1260 (Aroclor 1260)	NS	NS	NS	0.0583 J	0.248 J	0.267 J	0.0551	<0.0308 U	<0.0327 UJ	0.0558 J	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1262 (Aroclor 1262)	NS	NS	NS	<0.0328 U	<0.167 U	<0.165 UJ	<0.029 U	0.73	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
PCB-1268 (Aroclor 1268)	NS	NS	NS	<0.0328 U	<0.167 U	<0.165 UJ	<0.029 U	0.451	<0.0327 UJ	<0.0298 UJ	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
Total PCBs	1	10	NS	0.766	**3.36**	**4.16 J**	0.606	**1.64**	<0.0327 UJ	0.0558 J	<0.0326 U	<0.0333 UJ	<0.0319 U	<0.0292 U	<0.0285 U
Metals (mg/kg)															
Antimony	27	8200	NS	10.2	7.84	12	11.1	13.2	<3.29 U	3.1 J	7.72	6.71	7.62	5.59	5.66
Arsenic	10	10	NS	4.22	4.41	6.76	**15.2**	**14**	5.21	2.91	2.71	2.52	**23**	**14.1**	6.48
Barium	4700	140000	NS	250	154	310	389	653	101	113 J	167	199 J	289	250 J	175 J
Cadmium	34	1000	NS	1.98	2.17	4.19	3.96	11.6	0.481	1.18	0.881	1.04	1.5	0.441	0.458
Chromium, Total	NS	NS	NS	90.5	108	174	147	328	18.6	37.3 J	73.8	74	54.3	42.4	41.2
Copper	2500	76000	NS	89.2	133	271	194	**4,950**	457	103 J	62	143 J	75.4	46 J	46.8 J
Lead	400	1000	NS	199	202	**431**	297	**724**	100	338	75.4	171	111	67.4	85.1
Mercury	20	610	NS	0.218	0.222	0.22	0.261	0.375	0.364	0.39	0.0808	0.188	0.146	0.104	0.114
Nickel	1400	7500	NS	81.2 J	31.4	67.4	77.4	153	13.9	30.1 J	33.8	31.9 J	18	25.1 J	27.2 J
Silver	340	10000	NS	2.45	1.21	1.91	1.12	3.02	3.79	1.36 J	1.63	0.811	1.11	0.869	1.05
Vanadium	470	14000	NS	74.8	49.9	78	62.9	58.1	39.5	35.8	54.8	42.9	52.8	54.7	55.7
Zinc	20000	610000	NS	236	246	396	373	679	123	236 J	143	187	515	247	154

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting

Qualifiers:
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
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U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9A
March 2022 Soil Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Direct Exposure Criteria	Industrial/ Commercial Direct Exposure Criteria	GB Pollutant Mobility Criteria	SB-353	SB-354	SB-355	SB-356	SB-357	SB-358	SB-359	SB-360
				02/18/2022	02/18/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
				0-0.5	0.5-1	0.75-1.25	0-1	0.5-1	0.5-1.25	0.5-1.5	0.5-1.25
				Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (mg/kg)											
1,2-Dibromoethane (Ethylene Dibromide)	0.007	0.067	0.1	<0.0046 U	<0.005 U	NA	NA	NA	NA	NA	NA
Acetone	500	1000	140	<0.0092 UJ	<0.0099 UJ	NA	NA	NA	NA	NA	NA
Methylene Chloride	82	760	1	<0.0092 U	0.039	NA	NA	NA	NA	NA	NA
Trichloroethene (TCE)	56	520	1	<0.0046 U	<0.005 U	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds (mg/kg)											
Benzo(a)anthracene	1	7.8	1	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	0.677
Benzo(a)pyrene	1	1	1	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Benzo(b)fluoranthene	1	7.8	1	0.587	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Benzo(g,h,i)Perylene	8.4 *	78 *	1 *	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Benzo(k)fluoranthene	8.4	78	1	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Chrysene	84 *	780 *	1 *	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	0.608	0.654
Fluoranthene	1000	2500	56	0.975	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	1.21	1.69
Indeno(1,2,3-cd)pyrene	1 *	7.8 *	1 *	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	<0.592 U
Phenanthrene	1000	2500	40	<0.57 U	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	<0.6 U	1.1
Pyrene	1000	2500	40	0.695	<0.634 U	<0.626 U	<0.615 U	<0.641 U	<0.6 U	1.22	1.7
Petroleum Hydrocarbons (mg/kg)											
Total Extractable Petroleum Hydrocarbons	500	2500	2500	54.4	<48.3 U	NA	NA	NA	NA	NA	NA
Pesticides (mg/kg)											
4,4'-DDD	NS	NS	NS	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
4,4'-DDE	NS	NS	NS	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
4,4'-DDT	1.8 *	17 *	0.02 *	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Chlordane (alpha and gamma)	0.49	2.2	0.066	<0.0374 U	<0.0424 UJ	NA	NA	NA	NA	NA	NA
Dieldrin	0.038	0.36	0.007	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Heptachlor	0.14	1.3	0.013	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	0.067	0.63	0.02	<0.00281 U	<0.00318 UJ	NA	NA	NA	NA	NA	NA
Herbicides (mg/kg)											
Dalapon	NS	NS	NS	0.0254	0.046	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyl (mg/kg)											
PCB-1248 (Aroclor 1248)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	0.108	0.302	0.302 J
PCB-1254 (Aroclor 1254)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	<0.0302 U	<0.0306 U
PCB-1260 (Aroclor 1260)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	0.0871	0.167
PCB-1262 (Aroclor 1262)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	<0.0302 U	<0.0306 U
PCB-1268 (Aroclor 1268)	NS	NS	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	<0.0309 U	<0.0302 U	<0.0306 U
Total PCBs	1	10	NS	<0.0284 U	<0.0322 U	<0.0316 U	<0.032 U	<0.0321 U	0.108	0.389	0.47
Metals (mg/kg)											
Antimony	27	8200	NS	5.47	7.59	NA	10.8	10.3	7.3	6.38	4.81
Arsenic	10	10	NS	<1.72 U	4.24	NA	3.37	2.88	4.18	2.11	9.01
Barium	4700	140000	NS	115	151	NA	158	150	180	228	192
Cadmium	34	1000	NS	<0.344 U	0.494	NA	<0.386 U	<0.387 U	0.532	1.13	2.46
Chromium, Total	NS	NS	NS	32.4	55.8	NA	89.8	81.7	67.9	42.2	63.5
Copper	2500	76000	NS	31.9	46.2	NA	25.2 J	27.8 J	49.6 J	180 J	112 J
Lead	400	1000	NS	37.5	95.5	NA	72.1	56.5	85.6	299	223
Mercury	20	610	NS	0.108	0.222	NA	0.0943	0.139	0.0713	0.175	0.27
Nickel	1400	7500	NS	8.44	15.6	NA	48.6 J	51.6 J	44.4 J	41.5 J	44.1 J
Silver	340	10000	NS	1.43	1.31	NA	0.697	0.991	<0.621 U	0.732	0.691
Vanadium	470	14000	NS	38.3	53	NA	64.7	69.6	50.3	31.6	45.1
Zinc	20000	610000	NS	90.2	175	NA	109	203	197	333	328

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental Protection
DF - Dilution factor
mg/kg - Milligrams per kilogram
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting

Qualifiers:
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate or
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria
10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria
10 - RL exceeds screening level

Table 9B
March 2022 Groundwater Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Groundwater Volatilization Criteria	Surface Water Protection Criteria	MW-1	MW-05	MW-08	MW-09	DUP-GW_031122 MW-09	MW-10
			03/11/2022	3/15/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
			Result	Result	Result	Result	Result	Result
Volatile Organic Compounds (ug/L)								
1,2,4-Trimethylbenzene	940 *	150 *	<0.5 U	1.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-Dibromoethane (Ethylene Dibromide)	0.3	NS	*<0.5 U*	*<0.5 U*	*<0.5 U*	*<0.5 U*	*<0.5 U*	*<0.5 U*
Acetone	50000	10000 *	<2 U	<2 U	2.94	<2 U	<2 U	<2 U
Cis-1,2-Dichloroethene	NS	6200 *	2.48	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Ethylbenzene	50000	580000	<0.5 U	0.83	<0.5 U	<0.5 U	<0.5 U	<0.5 U
M,P-Xylene	NS	NS	<1 U	3.6	<1 U	<1 U	<1 U	<1 U
Naphthalene	NS	210 *	<2 U	8	<2 U	<2 U	<2 U	<2 U
o-Xylene (1,2-Dimethylbenzene)	NS	NS	<0.5 U	1.8	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Tetrachloroethene (PCE)	340	88	3.28 J	<0.5 UJ	0.61 J	0.99 J	0.96 J	<0.5 UJ
Toluene	23500	4000000	<0.5 U	4.4	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Trans-1,2-Dichloroethene	NS	10000 *	0.86	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Trichloroethene (TCE)	27	2340	27	<0.5 U	7.14	7.11	7.13	<0.5 U

Notes:
APS - Additional Polluting Substance
CTDEEP - Connecticut Department of Energy and Environmental
DF - Dilution factor
ug/l - micrograms per liter
<RL - Not detected
NA - Not Analyzed
NS - No standard
Q - Qualifier
RL - Reporting Limit
RSRs - Remediation Standard Regulations
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, amended 16 February 2021, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria.

Qualifiers:
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate

Exceedance Summary:
10 - Result exceeds CTDEEP RSRs - Residential Groundwater Volatilization Criteria
10 - Result exceeds CTDEEP RSRs - Surface Water Protection Criteria
10 - RL exceeds screening level

Table 9C
March 2022 Soil Vapor Analytical Results Summary
Western Middle School
1 Western Junior Highway, Greenwich, Connecticut
Langan Project No.: 140148201

Analyte	Residential Soil Vapor Volatilization Criteria	SV-01	SV-02	DUP-SV_031122 SV-02	SV-03
		03/11/2022	03/11/2022	03/11/2022	03/11/2022
		Result	Result	Result	Result
Volatile Organic Compounds (ug/m3)					
1,2,4-Trimethylbenzene	20000 *	2.5	2.3	2.9	1.6
1,3,5-Trimethylbenzene (Mesitylene)	20000 *	<0.82 U	<0.85 U	1.1	<0.78 U
1,3-Dichlorobenzene	55000	27	17	17	<0.95 U
Acetone	140000	60	32	24	30
Benzene	2500	0.74	8 J	4.4 J	1
Carbon Tetrachloride	380	0.31	0.33	0.31	0.4
Chloroform	380	<0.81 U	1.8	1.4	0.85
Chloromethane	3600 *	0.58	0.43	0.62	0.65
Cis-1,2-Dichloroethene	NS	0.59	0.82 J	0.4 J	<0.16 U
Dichlorodifluoromethane	39000 *	3.3	2.1	2.1	2.3
Ethylbenzene	40000	2.7	3.1	2.5	1.5
M,P-Xylene	NS	12	10	8.6	6.2
Methyl Ethyl Ketone (2-Butanone)	376000	3.4	3 J	1.9 J	0.74
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	28000	0.82	7 J	<0.68 UJ	<0.65 U
Methylene Chloride	2300	15	7.3 J	27 J	6.1
o-Xylene (1,2-Dimethylbenzene)	NS	3.5	2.9	2.8	2.1
Tetrachloroethene (PCE)	3800	4.8	7 J	3.9 J	2.1
Toluene	160000	13	11 J	7 J	2.9
Total Xylenes	170000	16	13	11	8.4
Trichloroethene (TCE)	760	28	3.4 J	2.1 J	<0.21 U
Trichlorofluoromethane	280000 *	1.4	1.3	1.3	1.8

Notes:
CT DEEP - Connecticut Department of Energy and Environmental Protection
RSRs - Remediation Standard Regulations
CAS - Chemical Abstract Service
NS - No standard
ug/m3 - Micrograms per cubic meter
ND - Not detected
RL - Reporting Limit
<RL - Not detected
* - Additional Polluting Substance
* - For those compounds that do not have certain criteria established within the CTDEEP RSRs, effective 30 January 1996 and 27 June 2013, additional polluting substance criteria must be requested for approval by the CTDEEP. The data was compared to the criteria listed in the 10 December 2015 (Revised 12 October 2018) Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances

Qualifiers:
J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ – The analyte was not detected at a level greater than or equal to the reporting limit; however, the reported reporting limit is approximate and may be inaccurate or imprecise.
U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

APPENDIX C

Historical Soil & Groundwater Analytical Results Summary Maps

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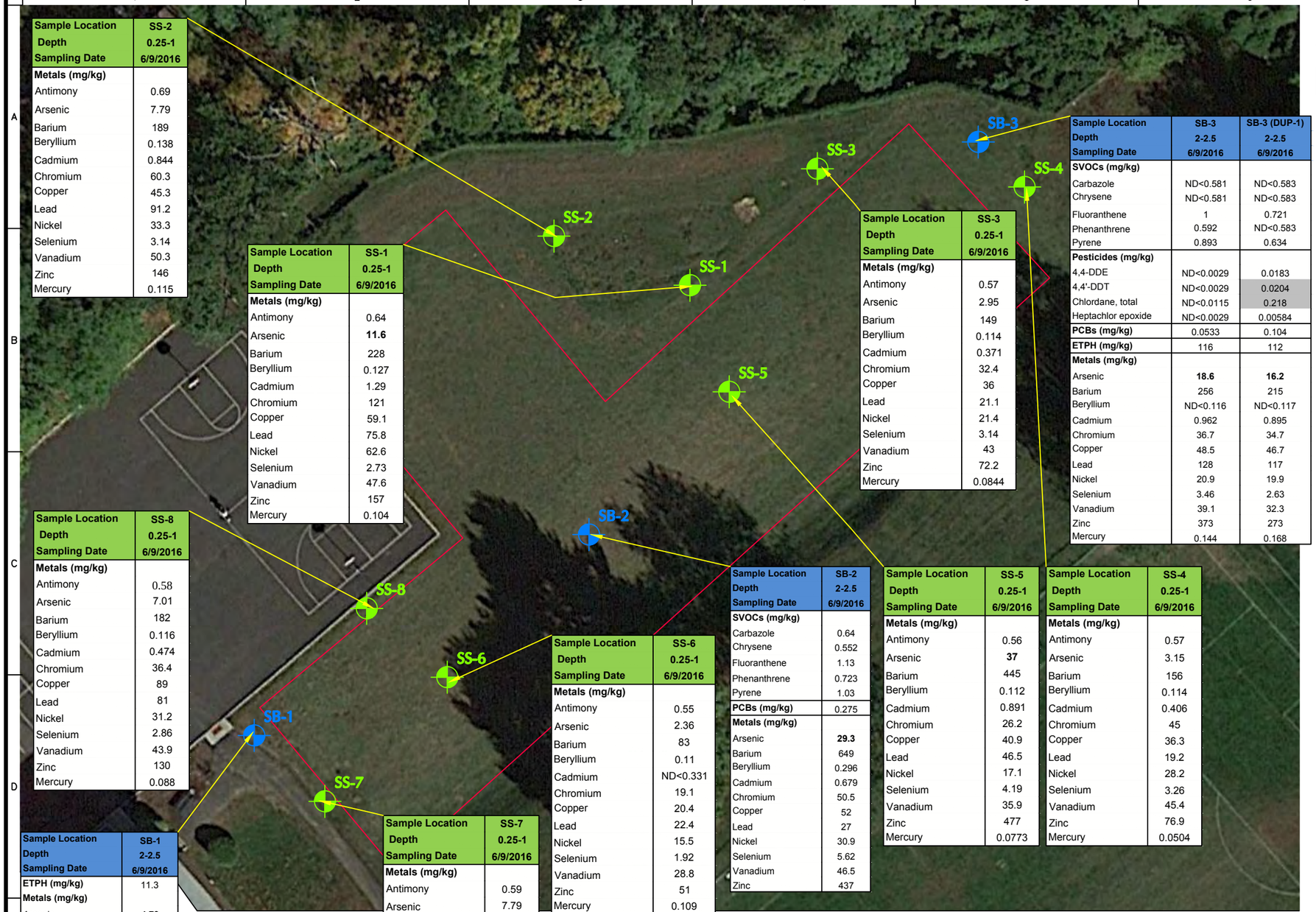
Historical Soil & Groundwater Analytical Results Summary Maps



Sample Location	SS-2
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.69
Arsenic	7.79
Barium	189
Beryllium	0.138
Cadmium	0.844
Chromium	60.3
Copper	45.3
Lead	91.2
Nickel	33.3
Selenium	3.14
Vanadium	50.3
Zinc	146
Mercury	0.115

Sample Location	SS-1
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.64
Arsenic	**11.6**
Barium	228
Beryllium	0.127
Cadmium	1.29
Chromium	121
Copper	59.1
Lead	75.8
Nickel	62.6
Selenium	2.73
Vanadium	47.6
Zinc	157
Mercury	0.104

Sample Location	SS-3
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.57
Arsenic	2.95
Barium	149
Beryllium	0.114
Cadmium	0.371
Chromium	32.4
Copper	36
Lead	21.1
Nickel	21.4
Selenium	3.14
Vanadium	43
Zinc	72.2
Mercury	0.0844

Sample Location	SB-3	SB-3 (DUP-1)
Depth	2-2.5	2-2.5
Sampling Date	6/9/2016	6/9/2016
SVOCs (mg/kg)		
Carbazole	ND<0.581	ND<0.583
Chrysene	ND<0.581	ND<0.583
Fluoranthene	1	0.721
Phenanthrene	0.592	ND<0.583
Pyrene	0.893	0.634
Pesticides (mg/kg)		
4,4-DDE	ND<0.0029	0.0183
4,4'-DDT	ND<0.0029	0.0204
Chlordane, total	ND<0.0115	0.218
Heptachlor epoxide	ND<0.0029	0.00584
PCBs (mg/kg)	0.0533	0.104
ETPH (mg/kg)	116	112
Metals (mg/kg)		
Arsenic	**18.6**	**16.2**
Barium	256	215
Beryllium	ND<0.116	ND<0.117
Cadmium	0.962	0.895
Chromium	36.7	34.7
Copper	48.5	46.7
Lead	128	117
Nickel	20.9	19.9
Selenium	3.46	2.63
Vanadium	39.1	32.3
Zinc	373	273
Mercury	0.144	0.168

Sample Location	SS-8
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.58
Arsenic	7.01
Barium	182
Beryllium	0.116
Cadmium	0.474
Chromium	36.4
Copper	89
Lead	81
Nickel	31.2
Selenium	2.86
Vanadium	43.9
Zinc	130
Mercury	0.088

Sample Location	SB-2
Depth	2-2.5
Sampling Date	6/9/2016
SVOCs (mg/kg)	
Carbazole	0.64
Chrysene	0.552
Fluoranthene	1.13
Phenanthrene	0.723
Pyrene	1.03
PCBs (mg/kg)	0.275
Metals (mg/kg)	
Arsenic	**29.3**
Barium	649
Beryllium	0.296
Cadmium	0.679
Chromium	50.5
Copper	52
Lead	27
Nickel	30.9
Selenium	5.62
Vanadium	46.5
Zinc	437

Sample Location	SS-5
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.56
Arsenic	**37**
Barium	445
Beryllium	0.112
Cadmium	0.891
Chromium	26.2
Copper	40.9
Lead	46.5
Nickel	17.1
Selenium	4.19
Vanadium	35.9
Zinc	477
Mercury	0.0773

Sample Location	SS-4
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.57
Arsenic	3.15
Barium	156
Beryllium	0.114
Cadmium	0.406
Chromium	45
Copper	36.3
Lead	19.2
Nickel	28.2
Selenium	3.26
Vanadium	45.4
Zinc	76.9
Mercury	0.0504

Sample Location	SS-6
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.55
Arsenic	2.36
Barium	83
Beryllium	0.11
Cadmium	ND<0.331
Chromium	19.1
Copper	20.4
Lead	22.4
Nickel	15.5
Selenium	1.92
Vanadium	28.8
Zinc	51
Mercury	0.109

Sample Location	SB-1
Depth	2-2.5
Sampling Date	6/9/2016
ETPH (mg/kg)	11.3
Metals (mg/kg)	
Arsenic	**4.73**
Barium	198
Beryllium	ND<0.107
Cadmium	0.471
Chromium	89.2
Copper	35.8
Lead	25.5
Nickel	43.7
Selenium	3.43
Vanadium	61.1
Zinc	64.2
Pesticides (mg/kg)	
4,4'-DDT	0.00347

Sample Location	SS-7
Depth	0.25-1
Sampling Date	6/9/2016
Metals (mg/kg)	
Antimony	0.59
Arsenic	7.79
Barium	283
Beryllium	0.118
Cadmium	1.23
Chromium	104
Copper	61.2
Lead	63.5
Nickel	51.5
Selenium	3.18
Vanadium	65.5
Zinc	147
Mercury	0.102

KEY MAP

SCALE: 1" = 250'

Analyte	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria
SVOCs (mg/kg)		
Carbazole	31	1
Chrysene	84	1
Fluoranthene	1,000	56
Phenanthrene	1,000	40
Pyrene	1,000	40
Pesticides (mg/kg)		
4,4-DDE	1.8	0.02
4,4'-DDT	1.8	0.02
Chlordane, total	0.49	0.066
Heptachlor epoxide	0.067	0.02
PCBs (mg/kg)	1	NE
ETPH (mg/kg)	500	2,500
Metals (mg/kg)		
Antimony	27	NE
Arsenic	10	NE
Barium	4,700	NE
Beryllium	2	NE
Cadmium	34	NE
Chromium	4,000	NE
Copper	2,500	NE
Lead	400	NE
Nickel	1,400	NE
Selenium	340	NE
Silver	340	NE
Thallium	5.4	NE
Vanadium	470	NE
Zinc	20,000	NE
Mercury (mg/kg)		
Mercury	20	NE

LEGEND

- SB-3 — LANGAN SOIL BORINGS
- SS-4 — LANGAN SURFICAL SOIL BORINGS
- PROPOSED LOCATION OF MODULAR CLASSROOMS

GENERAL NOTES

1 LANGAN "SB" SOIL BORINGS WERE ADVANCED TO 15 FEET BELOW GRADE

2 LANGAN "SS" SOIL BORINGS ADVANCED TO 6 INCHES BELOW GRADE

3 ONLY ANALYTES WITH DETECTIONS ARE SHOWN IN THE TABLE

4 BOLD INDICATES AN EXCEEDANCE OF THE RESIDENTIAL DIRECT EXPOSURE CRITERIA

5 SHADING INDICATES AN EXCEEDANCE OF THE POLLUTANT MOBILITY CRITERIA

6 ND = NOT DETECTED ABOVE LABORATORY REPORTING LIMITS

7 MG/KG = MILLIGRAMS PER KILOGRAM

8 VOCS = VOLATILE ORGANIC COMPOUNDS

9 SVOCS = SEMI-VOLATILE ORGANIC COMPOUNDS

40 0 10 25 40

SCALE IN FEET

LANGAN

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Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

Drawing Title

JUNE 2016 PHASE II ESI SOIL ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 1
Date FEBRUARY 2018	
Scale 1"=40'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 1 of 15

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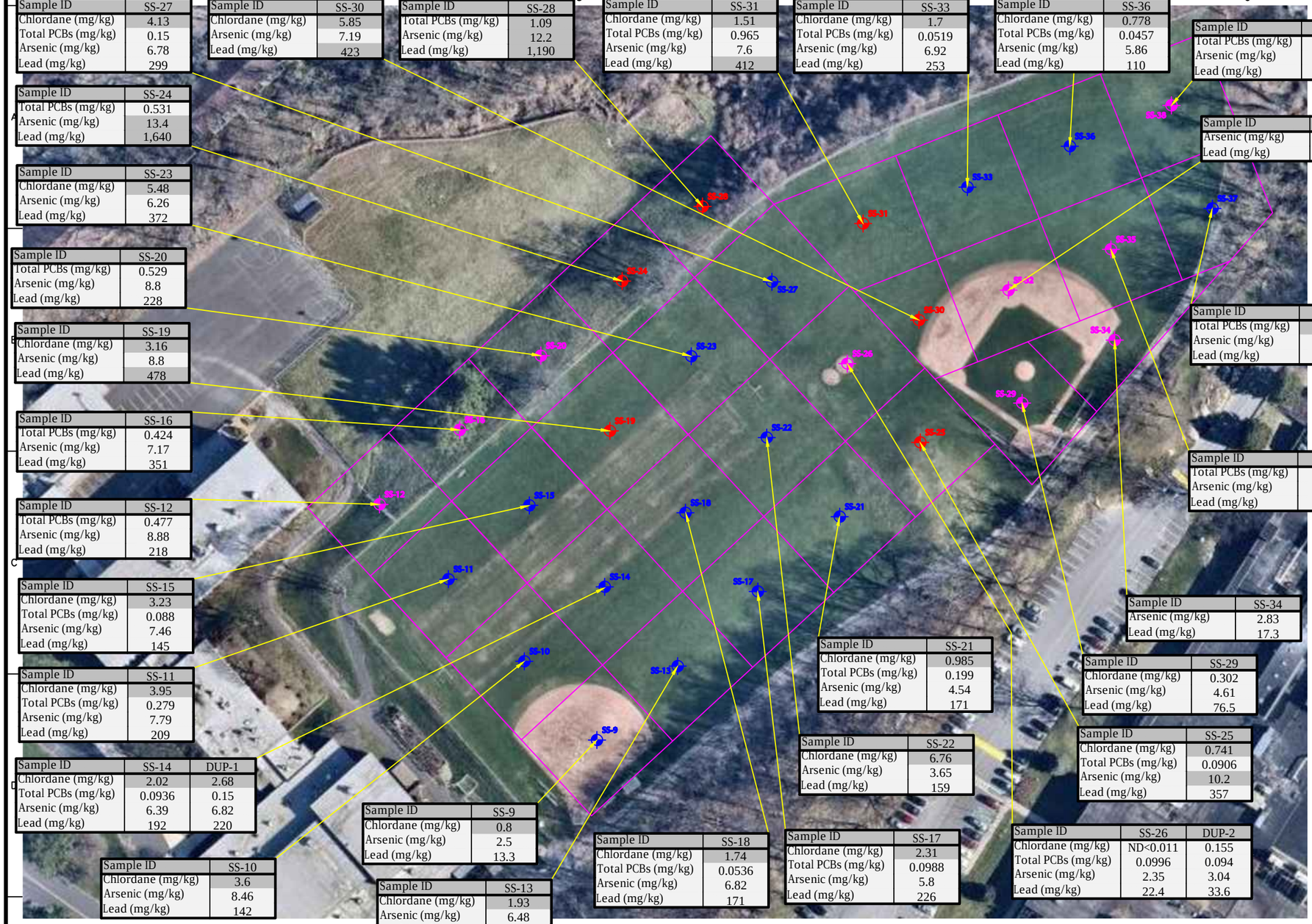

Sample ID	SS-27
Chlordane (mg/kg)	4.13
Total PCBs (mg/kg)	0.15
Arsenic (mg/kg)	6.78
Lead (mg/kg)	299

Sample ID	SS-30
Chlordane (mg/kg)	5.85
Arsenic (mg/kg)	7.19
Lead (mg/kg)	423

Sample ID	SS-28
Total PCBs (mg/kg)	1.09
Arsenic (mg/kg)	12.2
Lead (mg/kg)	1,190

Sample ID	SS-31
Chlordane (mg/kg)	1.51
Total PCBs (mg/kg)	0.965
Arsenic (mg/kg)	7.6
Lead (mg/kg)	412

Sample ID	SS-33
Chlordane (mg/kg)	1.7
Total PCBs (mg/kg)	0.0519
Arsenic (mg/kg)	6.92
Lead (mg/kg)	253

Sample ID	SS-36
Chlordane (mg/kg)	0.778
Total PCBs (mg/kg)	0.0457
Arsenic (mg/kg)	5.86
Lead (mg/kg)	110

Sample ID	SS-38
Total PCBs (mg/kg)	0.742
Arsenic (mg/kg)	7.03
Lead (mg/kg)	303

Sample ID	SS-32
Arsenic (mg/kg)	3.49
Lead (mg/kg)	7.74

Sample ID	SS-37
Total PCBs (mg/kg)	5.03
Arsenic (mg/kg)	7.17
Lead (mg/kg)	244

Sample ID	SS-35
Total PCBs (mg/kg)	0.237
Arsenic (mg/kg)	5.17
Lead (mg/kg)	168

Sample ID	SS-34
Arsenic (mg/kg)	2.83
Lead (mg/kg)	17.3

Sample ID	SS-29
Chlordane (mg/kg)	0.302
Arsenic (mg/kg)	4.61
Lead (mg/kg)	76.5

Sample ID	SS-25
Chlordane (mg/kg)	0.741
Total PCBs (mg/kg)	0.0906
Arsenic (mg/kg)	10.2
Lead (mg/kg)	357

Sample ID	SS-26	DUP-2
Chlordane (mg/kg)	ND<0.011	0.155
Total PCBs (mg/kg)	0.0996	0.094
Arsenic (mg/kg)	2.35	3.04
Lead (mg/kg)	22.4	33.6

Sample ID	SS-24
Total PCBs (mg/kg)	0.531
Arsenic (mg/kg)	13.4
Lead (mg/kg)	1,640

Sample ID	SS-23
Chlordane (mg/kg)	5.48
Arsenic (mg/kg)	6.26
Lead (mg/kg)	372

Sample ID	SS-20
Total PCBs (mg/kg)	0.529
Arsenic (mg/kg)	8.8
Lead (mg/kg)	228

Sample ID	SS-19
Chlordane (mg/kg)	3.16
Arsenic (mg/kg)	8.8
Lead (mg/kg)	478

Sample ID	SS-16
Total PCBs (mg/kg)	0.424
Arsenic (mg/kg)	7.17
Lead (mg/kg)	351

Sample ID	SS-12
Total PCBs (mg/kg)	0.477
Arsenic (mg/kg)	8.88
Lead (mg/kg)	218

Sample ID	SS-15
Chlordane (mg/kg)	3.23
Total PCBs (mg/kg)	0.088
Arsenic (mg/kg)	7.46
Lead (mg/kg)	145

Sample ID	SS-11
Chlordane (mg/kg)	3.95
Total PCBs (mg/kg)	0.279
Arsenic (mg/kg)	7.79
Lead (mg/kg)	209

Sample ID	SS-14	DUP-1
Chlordane (mg/kg)	2.02	2.68
Total PCBs (mg/kg)	0.0936	0.15
Arsenic (mg/kg)	6.39	6.82
Lead (mg/kg)	192	220

Sample ID	SS-10
Chlordane (mg/kg)	3.6
Arsenic (mg/kg)	8.46
Lead (mg/kg)	142

Sample ID	SS-9
Chlordane (mg/kg)	0.8
Arsenic (mg/kg)	2.5
Lead (mg/kg)	13.3

Sample ID	SS-13
Chlordane (mg/kg)	1.93
Arsenic (mg/kg)	6.48
Lead (mg/kg)	95.7

Sample ID	SS-18
Chlordane (mg/kg)	1.74
Total PCBs (mg/kg)	0.0536
Arsenic (mg/kg)	6.82
Lead (mg/kg)	171

Sample ID	SS-17
Chlordane (mg/kg)	2.31
Total PCBs (mg/kg)	0.0988
Arsenic (mg/kg)	5.8
Lead (mg/kg)	226

Sample ID	SS-21
Chlordane (mg/kg)	0.985
Total PCBs (mg/kg)	0.199
Arsenic (mg/kg)	4.54
Lead (mg/kg)	171

Sample ID	SS-22
Chlordane (mg/kg)	6.76
Arsenic (mg/kg)	3.65
Lead (mg/kg)	159

LEGEND

SS-## SOIL BORING LOCATION WITH NO EXCEEDENCES OF THE RESIDENTIAL DIRECT EXPOSURE CRITERIA

SS-## SOIL BORING LOCATION WITH MORE THAN ONE EXCEEDENCE OF THE RESIDENTIAL DIRECT EXPOSURE CRITERIA

SS-## SOIL BORING LOCATION WITH CHLORDANE CONCENTRATIONS EXCEEDING RESIDENTIAL DIRECT EXPOSURE CRITERIA

NOTES

1. ALL SURFICIAL SOIL SAMPLES WERE COLLECTED 0 TO 3 INCHES BELOW GROUND SURFACE.
2. SHADING INDICATES AN EXCEEDANCE OF THE RDEC AS INDICATED BELOW.

Analyte	Residential Direct Exposure Criteria (mg/kg)
Chlordane	0.49
Total PCBs	1
Arsenic	10
Lead	400

100 0 50 100

SCALE IN FEET

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Langan International LLC
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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
JULY 2016 SURFICIAL SOIL ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 2
Date FEBRUARY 2018	
Scale 1"=100'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 2 of 15

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Tag Map JPH.dwg Date: 2/27/2018 Time: 11:22 User: jhall Style Table: Langan.stb Layout: HHRA

Sample ID	SS-28W20-N10
Lead (mg/kg)	467

Sample ID	SS-28N-20
Lead (mg/kg)	259

Sample ID	SS-28W20-NW10
Lead (mg/kg)	361

Sample ID	SS-28E-10
Lead (mg/kg)	340

Sample ID	SS-28W-30
Lead (mg/kg)	345

Sample ID	SS-28S-10
Lead (mg/kg)	288

Sample ID	SS-28W-40
Lead (mg/kg)	293

Sample ID	SS-28W20-S10
Lead (mg/kg)	476

Sample ID	SS-24N-10
Lead (mg/kg)	449

Sample ID	SS-28W20-S20
Lead (mg/kg)	295

Sample ID	SS-24W-10
Lead (mg/kg)	470

Sample ID	SS-22N-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-24S-20
Lead (mg/kg)	542

Sample ID	SS-24E-20
Lead (mg/kg)	537

Sample ID	SS-22E-10	SS-DUP_10.7.16
Chlordane (mg/kg)	ND<0.033	ND<0.033

Sample ID	SS-22W-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-22S-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-9N-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-9E-10
Chlordane (mg/kg)	ND<0.033

Sample ID	SS-9W-10
Chlordane (mg/kg)	0.0369

Sample ID	SS-9S-10
Chlordane (mg/kg)	ND<0.033

60 0 20 40 60

SCALE IN FEET

KEY MAP

SCALE: 1" = 250'

LEGEND

SS-## SOIL BORING LOCATION WITH LEAD CONCENTRATION BELOW 606 PPM; SOIL BORING LOCATION WITH CHLORDANE BELOW RDEC

SS-## SOIL BORING LOCATION WITH LEAD CONCENTRATION EXCEEDING 606 PPM; SOIL BORING LOCATION WITH CHLORDANE EXCEEDING RDEC

REMEDIAL EXCAVATION AREA

NOTES

1. BORING LOCATIONS ARE LOCATED BY GPS COORDINATES COLLECTED DURING SAMPLING AND MEASUREMENTS MADE IN THE FIELD.
2. ALL DELINEATION SOIL SAMPLES WERE COLLECTED FROM 0 TO 3 INCHES BELOW GROUND SURFACE.

Analyte	Residential Direct Exposure Criteria (mg/kg)	Site-Specific Action Level (mg/kg)
Chlordane	0.49	NE
Lead	400	606

MG/KG = MILLIGRAM PER KILOGRAM
NE = CRITERIA NOT ESTABLISHED FOR COMPOUND

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Langan CT, Inc.
Langan International LLC
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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
LEAD AND CHLORDANE DELINEATION ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 3A
Date FEBRUARY 2018	
Scale 1"=60'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 3 of 15

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Delineation Tag Map_DRAFT JPH.dwg Date: 2/7/2018 Time: 13:52 User: jhall Style Table: Langan.stb Layout: ANSIB-BL

Sample ID	SB-11 (3")	SB-11 (1')
Chlordane (mg/kg)	ND<0.0565	NA
Aroclor 1254 (mg/kg)	ND<0.0283	0.162
Total PCBs (mg/kg)	ND<0.0283	0.162

Sample ID	SB-10 (3")	SB-10 (1')
Chlordane (mg/kg)	ND<0.0577	NA
Aroclor 1254 (mg/kg)	ND<0.0288	ND<0.0265
Total PCBs (mg/kg)	ND<0.0288	ND<0.0265

Sample ID	SB-9 (3")	SB-9 (1')
Chlordane (mg/kg)	ND<0.0565	NA
Aroclor 1254 (mg/kg)	ND<0.0283	ND<0.0278
Total PCBs (mg/kg)	ND<0.0283	ND<0.0278

Sample ID	SB-8 (3")	SB-8 (1')
Chlordane (mg/kg)	ND<0.06	NA
Aroclor 1254 (mg/kg)	ND<0.03	ND<0.0271
Total PCBs (mg/kg)	ND<0.03	ND<0.0271

Sample ID	SB-7 (3")	SB-7 (1')
Chlordane (mg/kg)	ND<0.0569	NA
Aroclor 1254 (mg/kg)	ND<0.0285	ND<0.0274
Total PCBs (mg/kg)	ND<0.0285	ND<0.0274

Sample ID	SB-4 (3")	SB-4 (1')
Chlordane (mg/kg)	ND<0.0588	NA
Aroclor 1254 (mg/kg)	ND<0.0294	ND<0.0272
Total PCBs (mg/kg)	ND<0.0294	ND<0.0272

Sample ID	SB-5 (3")	SB-5 (1')
Chlordane (mg/kg)	0.326	NA
Aroclor 1254 (mg/kg)	ND<0.0269	ND<0.0273
Total PCBs (mg/kg)	ND<0.0269	ND<0.0273

Sample ID	SB-6 (3")	SB-6 (1')	DUP (1')
Chlordane (mg/kg)	ND<0.0577	NA	NA
Aroclor 1254 (mg/kg)	ND<0.0289	ND<0.0285	ND<0.0279
Total PCBs (mg/kg)	ND<0.0289	ND<0.0285	ND<0.0279

KEY MAP

SCALE: 1" = 250'

LEGEND

SS-## SHALLOW SOIL BORING LOCATION

NOTES

1. BORING LOCATIONS ARE LOCATED BY GPS COORDINATES COLLECTED DURING SAMPLING AND MEASUREMENTS MADE IN THE FIELD.
2. SOIL SAMPLES WERE COLLECTED FROM 0 TO 3 INCHES AND 12 INCHES BELOW GROUND SURFACE.

Analyte	Residential Direct Exposure Criteria (mg/kg)
Chlordane	0.49
Aroclor 1254	NE
Total PCBs	1

MG/KG = MILLIGRAM PER KILOGRAM
NA = COMPOUND NOT ANALYZED
ND = NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
NE = CRITERIA NOT ESTABLISHED FOR COMPOUND

50 0 25 50
SCALE IN FEET

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Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
OCTOBER 2016 RECREATIONAL AREA SOIL ANALYTICAL RESULTS MAP

Project No. 140148201
Date FEBRUARY 2018
Scale 1"=50'
Drawn By JPH | Checked By RJW
Submission Date FEBRUARY 2018

Drawing No. 3B
Sheet 4 of 15

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_Delineation Tag Map_DRAFT JPH.dwg Date: 2/7/2018 Time: 13:58 User: jhall Style Table: Langan.stb Layout: Swing Space

Sample ID	SS-28-E10-3"	SS-28-E10-1'
Total PCBs (mg/kg)	0.379	0.248

Sample ID	SS-28	SS-28-1'	SS-28-2'
Total PCBs (mg/kg)	1.09	1.18	0.187

Sample ID	SS-28-N10-3"	SS-28-N10-2'	SS-28-N10-3'
Total PCBs (mg/kg)	1.25	3.7	0.348

Sample ID	SS-28-N20-3"	SS-28-N20-2'
Total PCBs (mg/kg)	0.444	0.971*

Sample ID	SS-28-W10-3"	SS-28-W10-2'
Total PCBs (mg/kg)	10.3	0.0586

Sample ID	SS-28-W20N10-3"
Total PCBs (mg/kg)	0.0424

Sample ID	SS-28-W30-3"
Total PCBs (mg/kg)	ND<0.0316

Sample ID	SS-28-W20S10-3"
Total PCBs (mg/kg)	ND<0.0325

Sample ID	SS-28-W20-3"	SS-28-W20-2'
Total PCBs (mg/kg)	3.06	0.223

Sample ID	SS-28-S20-1'
Total PCBs (mg/kg)	0.188

Sample ID	SS-28-S10-3"	SS-28-S10-1'	SS-28-S10-2'
Total PCBs (mg/kg)	0.583	1*	ND<0.0251

SB-2 SB-9 SB-8 SB-70 SB-7 SS-24 SS-71 SS-27 SS-68 SS-69 SS-72 SS-58 SS-59 SS-20 SS-63 SS-34 SS-23 SS-26 SS-53 SS-16 SS-73 SS-87 SS-78 SS-67 SS-66 SS-60 SS-54 SS-29 SS-19 SS-22 SS-25 SS-55 SS-31 SS-57 SS-48 SS-33 SS-49 SS-52 SS-32 SS-50 SS-51 SS-45 SS-41 SS-47 SS-36 SS-46 SS-42

20 0 5 10 20
SCALE IN FEET

KEY MAP
SCALE: 1" = 250'

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG

NOTES

1. ALL SURFICIAL SOIL SAMPLES WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER.
2. FOR THE VERTICAL DELINEATION SOIL BORINGS ADVANCED AT THE PREVIOUS EXCEEDANCE LOCATIONS, SOIL SAMPLES WERE COLLECTED AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
3. FOR THE HORIZONTAL DELINEATION SOIL BORINGS, SOIL SAMPLES WERE COLLECTED WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER, AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
4. * = PCB CONCENTRATION APPROACHES RDEC OF 1 MG/KG NECESSITATING DELINEATION
5. MG/KG = MILLIGRAMS PER KILOGRAMS
6. ND = NON-DETECT
7. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA

ANALYTICAL RESULT TAG MAP

SOILS WITH PCBs > 1 MG/KG
SOILS WITH PCBs > 50 MG/KG

Sample ID
Total PCBs (mg/kg)

Sample # (Depth, "=inches, '=feet)
Concentration

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
SS-28 PCB DELINEATION ANALYTICAL RESULTS MAP

Project No.	Drawing No.
140148201	4A
Date: FEBRUARY 2018	
Scale: 1"=20'	
Drawn By: JPH / Checked By: RJW	
Submission Date: FEBRUARY 2018	Sheet 5 of 15

SUBMISSION DATE: FEBRUARY 2018
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-Design\Files\140148201-Western Middle School_PCB Excavation Exents_2017.10.30.dwg Date: 2/27/2018 Time: 11:25 User: jhall Style Table: Langan.stb Layout: SS-28 Excavation Extents

Sample ID	LB-31-N40-SO7 (2')	LB-31-N40-SO7 (3')	LB-31-N40-S7 (4')	LB-31-N40-S7 (6')	LB-31-N40-S7 (7')
Total PCBs (mg/kg)	4.92	3.58	14.8	2.45	0.28

Sample ID	SS-31-N40-2'	SS-31-N40-3'	SS-31-N40-4'
Total PCBs (mg/kg)	7.67	1.22	0.084

Sample ID	LB-31-N40-SO11 (2')	LB-31-N40-SO11 (4')
Total PCBs (mg/kg)	1.08	0.901*

Sample ID	LB-31-N40-SO14 (2')	LB-31-N40-SO14 (4')	LB-31-N40-SO14 (5')	LB-31-N40-SO14 (6')
Total PCBs (mg/kg)	0.637	70.8	93	0.408

Sample ID	LB-31-N40-SO5 (2')
Total PCBs (mg/kg)	0.0834

Sample ID	LB-31-N30-SO2 (2')	LB-31-N30-S02 (3')	LB-31-N30-S02 (4')	LB-31-N30-S02 (5')	LB-31-N30-S02 (7')
Total PCBs (mg/kg)	1.29	53.9	1.01	4.47	9.01

Sample ID	LB-31-N30-SO15 (2')	LB-31-N30-SO15 (4')
Total PCBs (mg/kg)	4.73	0.489

Sample ID	LB-31-N30-SO16 (2')	LB-31-N30-SO16 (4')	LB-31-N30-SO16 (5')
Total PCBs (mg/kg)	5.51	1.02	ND<0.0251

Sample ID	2017.09_SS31_1A (3")	2017.09_SS31_1A (2')	2017.09_SS31_1A (4')	2017.09_SS31_1A (5')
Total PCBs (mg/kg)	ND<0.0305	0.246	0.409	ND<0.0272

Sample ID	LB-31-N30-SO17 (2')	LB-31-N30-SO17 (4')
Total PCBs (mg/kg)	7.55	0.561

Sample ID	LB-31-N30-SO18 (3")	LB-31-N30-SO18 (2')	LB-31-N30-SO18 (4')
Total PCBs (mg/kg)	0.0778	0.829	0.137

Sample ID	2017.09_SS31_2B (3")	2017.09_SS31_2B (4')
Total PCBs (mg/kg)	ND<0.0305	0.18

Sample ID	2017.09_SS31_2A (2')	2017.09_SS31_2A (4')	2017.09_SS31_2A (5')
Total PCBs (mg/kg)	0.243	24.2	ND<0.0243

Sample ID	LB-31-N30-SO1 (2')	LB-31-N30-SO1 (4')
Total PCBs (mg/kg)	1.5	ND<0.029

Sample ID	2017.09_SS31_3A (3")	2017.09_SS31_3A (2')	2017.09_SS31_3A (4')
Total PCBs (mg/kg)	ND<0.0261	0.287	0.204

Sample ID	SS-31-N20W10-3"	SS-31-N20W10-2'
Total PCBs (mg/kg)	0.108	0.418

Sample ID	SS-31-W20-3"	SS-31-W20-2'
Total PCBs (mg/kg)	0.25	0.22

Sample ID	SS-31-W10-3"	SS-31-W10-2'
Total PCBs (mg/kg)	0.996*	0.116

Sample ID	SS-31-N10-3"	SS-31-N10-2'	SS-31-N10-3'
Total PCBs (mg/kg)	2.18	1.81	ND<0.0253

Sample ID	SS-31-3"	SS-31-1'	SS-31-2'
Total PCBs (mg/kg)	0.965*	6.6	0.394

Sample ID	SS-31-S20W10-3"	SS-31-S20W10-2'
Total PCBs (mg/kg)	ND<0.0338	0.73

Sample ID	SS-31-S10-3"	SS-31-S10-2'
Total PCBs (mg/kg)	8.8	0.0677

Sample ID	SS-31-S30-3"	SS-31-S30-3" (DUP)	SS-31-S30-2'
Total PCBs (mg/kg)	ND<0.0332	ND<0.0329	0.179

Sample ID	LB-31-N40-SO12 (2')	LB-31-N40-SO12 (4')	LB-31-N40-SO12 (5')	LB-31-N40-SO12 (6')
Total PCBs (mg/kg)	17.2	1.62	1.74	ND<0.0248

Sample ID	SS-31-N30-3"	SS-31-N30-2'	SS-31-N30-3'
Total PCBs (mg/kg)	ND<0.0347	78.5	0.163

Sample ID	LB-31-N40-SO8 (2')	LB-31-N40-SO8 (4')	LB-31-N40-SO8 (5')
Total PCBs (mg/kg)	95.3	2.14	ND<0.026

Sample ID	2017.09_SS31_4A (2')	2017.09_SS31_4A (4')	2017.09_SS31_4A (5')
Total PCBs (mg/kg)	0.714	4.54	0.302

Sample ID	2017.09_SS31_4B (3")	2017.09_SS31_4B (4')
Total PCBs (mg/kg)	0.0517	0.143

Sample ID	2017.09_SS31_5A (3")	2017.09_SS31_5A (2')
Total PCBs (mg/kg)	ND<0.0277	0.931

Sample ID	LB-31-N40-SO10 (3")	LB-31-N40-SO10 (2')	LB-31-N40-SO10 (4')
Total PCBs (mg/kg)	1.86	0.349	0.0441

Sample ID	LB-31-N40-SO9 (2')	LB-31-N40-SO9 (4')	LB-31-N40-SO9 (5')
Total PCBs (mg/kg)	9.71	3.07	ND<0.0265

Sample ID	SS-31-8A (3")	SS-31-8A (2')	SS-31-8A (4')
Total PCBs (mg/kg)	ND<0.309	0.308	0.0367

Sample ID	2017.09_SS31_6C (2')	2017.09_SS31_6C (4')	SS-31-6C (6')	SS-31-6C (7')	SS-31-6C (8')	SS-31-6C (9')
Total PCBs (mg/kg)	ND<0.028	89.6	8.25	16.4	27.4	0.332

Sample ID	2017.09_SS31_6B (3")	2017.09_SS31_6B (2')	2017.09_SS31_6B (4')	2017.09_SS31_6B (5')
Total PCBs (mg/kg)	ND<0.0288	1.75	1.06	ND<0.0282

Sample ID	SS-31-9A (4')	SS-31-9A (5')
Total PCBs (mg/kg)	2.17	0.282

Sample ID	2017.09_SS31_7B (2')	2017.09_SS31_7B (4')
Total PCBs (mg/kg)	1.5	0.893

Sample ID	LB-31-N30-SO3 (2')
Total PCBs (mg/kg)	ND<0.0322

Sample ID	2017.09_SS31_6A (2')	2017.09_SS31_6A (4')	2017.09_SS31_6A (5')
Total PCBs (mg/kg)	23.3	ND<0.0265	ND<0.0266

Sample ID	SS-31-10A (3")	SS-31-10A (4')
Total PCBs (mg/kg)	ND<0.0293	0.652

Sample ID	2017.09_SS31_7A (3")	2017.09_SS31_7A (2')
Total PCBs (mg/kg)	0.0679	0.143

Sample ID	SS-31-N20E10-3"	SS-31-N20E10-2'
Total PCBs (mg/kg)	0.115	0.14

Sample ID	SS-31-E20N10-3"	SS-31-E20N10-2'
Total PCBs (mg/kg)	ND<0.0347	0.437

Sample ID	SS-31-N20-3"	SS-31-N20-2'	SS-31-N20-4'
Total PCBs (mg/kg)	0.443	1.59	ND<0.0251

Sample ID	LB-31-S25E30-SO1 (2')
Total PCBs (mg/kg)	ND<0.0311

Sample ID	SS-31-E30-3"	SS-31-E30-2'
Total PCBs (mg/kg)	ND<0.0352	ND<0.0354

Sample ID	LB-31-S25E30-SO3 (2')
Total PCBs (mg/kg)	ND<0.031

Sample ID	SS-31-S25E30-3"	SS-31-S25E30-2'	SS-31-S25E30-3'
Total PCBs (mg/kg)	0.179	9.35	ND<0.0286

Sample ID	SS-31-E20-3"	SS-31-E20-2'	SS-31-E20-4'
Total PCBs (mg/kg)	ND<0.0308	5.68	ND<0.0267

Sample ID	LB-31-S25E30-SO5 (2')
Total PCBs (mg/kg)	ND<0.0268

Sample ID	SS-31-E20S10-3"	SS-31-E20S10-2'	SS-31-E20S10-3.5'
Total PCBs (mg/kg)	0.138	7.77	ND<0.028

Sample ID	SS-31-S20E10-3"	SS-31-S20E10-2'
Total PCBs (mg/kg)	ND<0.0345	0.177

Sample ID	SS-31-E10-3"	SS-31-E10-2'
Total PCBs (mg/kg)	5.51	0.325

Sample ID	SS-31-S20-3"	SS-31-S20-2'	SS-31-S20-3'
Total PCBs (mg/kg)	1.22	1.23	ND<0.0266

SS-1 SS-2 SS-3 SS-4 SS-5 SS-6 SS-7 SS-8 SS-9 SS-10 SS-11 SS-12 SS-13 SS-14 SS-15 SS-16 SS-17 SS-18 SS-19 SS-20 SS-21 SS-22 SS-23 SS-24 SS-25 SS-26 SS-27 SS-28 SS-29 SS-30 SS-31 SS-32 SS-33 SS-34 SS-35 SS-36 SS-37 SS-38 SS-39 SS-40 SS-41 SS-42 SS-43 SS-44 SS-45 SS-46 SS-47 SS-48 SS-49 SS-50 SS-51 SS-52 SS-53 SS-54 SS-55 SS-56 SS-57 SS-58 SS-59 SS-60 SS-61 SS-62 SS-63 SS-64 SS-65 SS-66 SS-67 SS-68 SS-69 SS-70

20 0 5 10 20
SCALE IN FEET

KEY MAP
SCALE: 1" = 250'

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG

NOTES

1. ALL SURFICIAL SOIL SAMPLES WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER.
2. FOR THE VERTICAL DELINEATION SOIL BORINGS ADVANCED AT THE PREVIOUS EXCEEDANCE LOCATIONS, SOIL SAMPLES WERE COLLECTED AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
3. FOR THE HORIZONTAL DELINEATION SOIL BORINGS, SOIL SAMPLES WERE COLLECTED WERE COLLECTED 0 TO 3 INCHES BELOW GRASS COVER, AT 1-FOOT INTERVALS TO 5 FEET BGS, AND THEN 5-FOOT INTERVALS THEREAFTER TO 15 FEET BGS OR SPOON REFUSAL.
4. * = PCB CONCENTRATION APPROACHES RDEC OF 1 MG/KG NECESSITATING DELINEATION
5. MG/KG = MILLIGRAMS PER KILOGRAMS
6. NON = NON-DETECT
7. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA

ANALYTICAL RESULT TAG KEY

SOILS WITH PCBs > 1 MG/KG
SOILS WITH PCBs > 50 MG/KG

Sample ID	Sample # (Depth, "=inches, '=feet)
Total PCBs (mg/kg)	Concentration

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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
SS-31 PCB DELINEATION ANALYTICAL RESULTS MAP

Project No.	Drawing No.
140148201	4B
Date: FEBRUARY 2018	
Scale: 1"=20'	
Drawn By: JPH / Checked By: RJW	
Submission Date: FEBRUARY 2018	Sheet 6 of 15

LANGAN
SUBMISSION DATE: FEBRUARY 2018
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-Design\Files\140148201-Western Middle School_PCB Excavation Exents_2017.10.30.dwg Date: 2/27/2018 Time: 11:26 User: jhall Style Table: Langan.stb Layout: SS-31 Excavation Extents

Sample ID	2017.09_SS37_4B (2')	2017.09_SS37_4B (3'10")
Total PCBs (mg/kg)	3.34	ND<0.0256

Sample ID	LB-37-N40-SO4 (2')	LB-37-N40-SO4 (4')
Total PCBs (mg/kg)	6.53	0.436

Sample ID	2017.09_SS37_3B (2')	2017.09_SS37_3B (4')	2017.09_SS37_3B (5')
Total PCBs (mg/kg)	1.3	7.74	0.189

Sample ID	2017.09_SS37_3A (2')	2017.09_SS37_3A (4')
Total PCBs (mg/kg)	11.9	ND<0.0262

Sample ID	SS-38-1A (8'-10')
Total PCBs (mg/kg)	ND<0.0286

Sample ID	LB-37-N40-SO5 (2')	LB-37-N40-SO5 (4')	LB-37-N40-SO5 (5')	LB-37-N40-SO5 (6')
Total PCBs (mg/kg)	0.154	3.52	7.62	ND<0.0441

Sample ID	2017.09_SS37_2A (2')	2017.09_SS37_2A (4')	2017.09_SS37_2A (5')
Total PCBs (mg/kg)	1.96	16.4	0.395

Sample ID	2017.09_SS37_2B (2')	2017.09_SS37_2B (4')
Total PCBs (mg/kg)	1.52	0.6

Sample ID	2017.09_SS37_1A (2')	2017.09_SS37_1A (4')	2017.09_SS37_1A (5')	2017.09_SS37_1A (6')
Total PCBs (mg/kg)	0.656	1.26	4.07	ND<0.0332

Sample ID	2017.09_SS37_1B (4')	2017.09_SS37_1B (5')
Total PCBs (mg/kg)	1.39	ND<0.0254

Sample ID	LB-37-N20W20-SO4 (3")	LB-37-N20W20-SO4 (2')
Total PCBs (mg/kg)	ND<0.0334	0.141

Sample ID	LB-37-N20W20-SO3 (2')
Total PCBs (mg/kg)	0.213

Sample ID	SS-37-N20W10-3"	SS-37-N20W10-5'
Total PCBs (mg/kg)	ND<0.0332	0.82

Sample ID	LB-37-N20W20-SO2 (2')	DUP-1-6.8.17
Total PCBs (mg/kg)	0.533	0.503

Sample ID	SS-37-N20W20-2'	SS-37-N20W20-4'
Total PCBs (mg/kg)	9.25	0.0507

Sample ID	SS-37-W20N10-3"	SS-37-W20N10-2'	SS-37-W20N10-4'
Total PCBs (mg/kg)	ND<0.0312	11.8	0.113

Sample ID	SS-37-W30-3"	SS-37-W30-2'
Total PCBs (mg/kg)	ND<0.0328	0.765

Sample ID	SS-37-W20-3"	SS-37-W20-2'	SS-37-W20-4'
Total PCBs (mg/kg)	1.88	123	ND<0.0255

Sample ID	SS-37-W20S10-3"	SS-37-W20S10-2'
Total PCBs (mg/kg)	0.0633	0.258

Sample ID	SS-37-W10-3"	SS-37-W10-2'
Total PCBs (mg/kg)	11.4	0.386

Sample ID	SS-37-S20W10-3"	SS-37-S20W10-2'
Total PCBs (mg/kg)	ND<0.0321	0.414

Sample ID	SS-37-S10-3"	SS-37-S10-2'
Total PCBs (mg/kg)	318	0.491

Sample ID	SS-37-S20-3"	SS-37-S20-2'	SS-37-S20-4'
Total PCBs (mg/kg)	0.821	3.17	0.101

Sample ID	2017.09_SS37_4A (2')	2017.09_SS37_4A (4')
Total PCBs (mg/kg)	1.07	ND<0.0249

Sample ID	LB-37-N40-SO3 (2')	LB-37-N40-SO3 (4')
Total PCBs (mg/kg)	25.8	0.161

Sample ID	LB-37-N40-SO2 (1.5')
Total PCBs (mg/kg)	44.2

Sample ID	LB-37-N40-SO1 (2')	LB-37-N40-SO1 (3.5')
Total PCBs (mg/kg)	13.8	543

Sample ID	SS-37-N40-3"	SS-37-N40-2'	SS-37-N40-4'	SS-37-N40-5'
Total PCBs (mg/kg)	0.0952	18.9	20.2	0.222

Sample ID	SS-37-N30-3"	SS-37-N30-5'	SS-37-N30-6'
Total PCBs (mg/kg)	0.0801	11.2	0.0426

Sample ID	SS-37-N20-3"	SS-37-N20-2'	SS-37-N20-4'	SS-37-N20-5'	SS-37-N20-6'
Total PCBs (mg/kg)	4.39	1.78	1.51	2.98	0.587

Sample ID	SS-37-N20E20-3"	SS-37-N20E20-2'
Total PCBs (mg/kg)	0.38	ND<0.0294

Sample ID	SS-37-N20E10-3"	SS-37-N20E10-2'	SS-37-N20E10-5'
Total PCBs (mg/kg)	1.65	0.42	0.0301

Sample ID	SS-37-N10-3"	SS-37-N10-2'	SS-37-N10-4'
Total PCBs (mg/kg)	250	1.12	0.477

Sample ID	SS-37-E20-3"	SS-37-E20-2'	SS-37-E20-3'	SS-37-E20-5'
Total PCBs (mg/kg)	1.43	1*	2.96	1.04

Sample ID	SS-37-E10-3"	SS-37-E10-2'	SS-37-E10-4'
Total PCBs (mg/kg)	0.293	3.02	0.397

Sample ID	SS-37	SS-37-1'	SS-37-1' (DUP)	SS-37-2'	SS-37-4'
Total PCBs (mg/kg)	5.03	174	124	12.7	0.446

Sample ID	SS-37-S20E10-3"	SS-37-S20E10-2'
Total PCBs (mg/kg)	0.0563	0.161

Sample ID	SS-37-S30-3"	SS-37-S30-2'
Total PCBs (mg/kg)	0.0728	0.27

KEY MAP
SCALE: 1" = 250'

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
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ANALYTICAL RESULT TAG KEY

SOILS WITH PCBs > 1 MG/KG
SOILS WITH PCBs > 50 MG/KG

Sample ID	Sample # (Depth, "=inches, '=feet)
Total PCBs (mg/kg)	Concentration

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Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWHICH CONNECTICUT

Drawing Title
SS-37 PCB DELINEATION ANALYTICAL RESULTS MAP

Project No. 140148201	Drawing No. 4C
Date FEBRUARY 2018	
Scale 1"=20'	
Drawn By JPH / Checked By RJW	
Submission Date FEBRUARY 2018	Sheet 7 of 15

LANGAN
SUBMISSION DATE: FEBRUARY 2018
PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-Design\Files\140148201-Western Middle School_PCB Excavation Exents_2017.10.30.dwg Date: 2/27/2018 Time: 11:27 User: jhall Style Table: Langan.stb Layout: SS-37 Excavation Extents

SEE FIGURE 6 FOR DELINEATION RESULTS FOR SS-28

SEE FIGURE 7 FOR DELINEATION RESULTS FOR SS-31

SEE FIGURE 8 FOR DELINEATION RESULTS FOR SS-37

SB-3 (2-2.5')	DUP-1 (SB-3 (2-2.5'))
0.0533	0.104

SS-28 (3")
1.09

SB-9 (3")	SB-9 (1')
ND<0.0283	ND<0.0278

SS-70 (3")	SS-70 (1')
ND<0.0333	ND<0.0299

SS-57 (3")	SS-57 (1')
ND<0.0333	0.2

SS-48 (3")	SS-48 (1')
ND<0.0326	0.565

SS-52 (3")	SS-52 (6")	SS-52 (1')
ND<0.0279	ND<0.0276	ND<0.0283

SS-47 (3")	SS-47 (1')
ND<0.0305	ND<0.0295

SS-46 (3")	SS-46 (1')
ND<0.0322	ND<0.0283

SS-45 (3")	SS-45 (1')
ND<0.0322	ND<0.0289

SS-39 (3")	SS-39 (1')
ND<0.0322	ND<0.0307

SS-40 (3")	SS-40 (1')
0.0667	0.561

SS-38 (3")
0.742

SS-41 (3")	SS-41 (1')
ND<0.0319	0.0361

SS-36 (3")
0.0457

SS-33 (3")
0.0519

SS-42 (3")	SS-42 (1')
ND<0.0375	ND<0.0296

SS-43 (3")	SS-43 (1')
ND<0.0339	3.62

SS-37 (3")
5.03

SB-11 (3")	SB-11 (1')
ND<0.0283	0.162

SB-10 (3")	SB-10 (1')
ND<0.0288	ND<0.0265

SS-71 (3")	SS-71 (1')
ND<0.0334	0.0532

SB-8 (3")	SB-8 (1')
ND<0.03	ND<0.0271

SS-27 (3")
0.15

SS-24 (3')
0.531

SB-7 (3")	SB-7 (1')
ND<0.0285	ND<0.0274

SS-68 (3")	SS-68 (1')
ND<0.0313	ND<0.029

SS-31 (3")
0.965

SS-32 (3")
ND<0.0263

SS-49 (3")	SS-49 (6")	SS-49 (1')
ND<0.0285	ND<0.0285	ND<0.0274

SS-35 (3")
0.237

SS-50 (3")	SS-50 (6")	SS-50 (1')
ND<0.0264	ND<0.0275	ND<0.0276

SS-69 (3")	DUP-4_6.9.17 (SS-69 (3"))	SS-69 (1')
ND<0.0307	ND<0.0295	ND<0.0297

SS-30 (3")
ND<0.0358

SB-2 (2-2.5')
0.275

SS-72 (3")	SS-72 (1')
ND<0.0349	ND<0.0295

SS-59 (3")	SS-59 (1')
ND<0.0357	ND<0.03

SS-44 (3")	SS-44 (1')
0.0348	ND<0.0285

SS-34 (3")
ND<0.0282

SB-5 (3")	SB-5 (1')
ND<0.0269	ND<0.0273

SS-23 (3")
ND<0.0401

SS-26 (3")	DUP (SS-26 (3"))
0.0996	0.094

SS-58 (3")	SS-58 (1')
ND<0.0305	1.54

SB-1 (2-2.5')
ND<0.0267

SB-6 (3")	SB-6 (1')	DUP (SB-6 (1'))
ND<0.0289	ND<0.0285	ND<0.0279

SS-78 (3")	SS-78 (1')
ND<0.0327	ND<0.0329

SS-20 (3")
0.529

SS-73 (3")	SS-73 (1')
ND<0.0339	0.197

SS-67 (3")	SS-67 (1')
ND<0.0338	0.0473

SS-29 (3")
ND<0.0313

SS-60 (3")	SS-60 (1')
ND<0.0302	0.0525

SS-51 (3")	SS-51 (6")	SS-51 (1')
ND<0.0267	ND<0.0266	ND<0.0273

SB-4 (3")	SB-4 (1')
ND<0.0294	ND<0.0272

SS-74 (3")	SS-74 (1')
ND<0.0335	0.306

SS-87 (3")	SS-87 (1')
ND<0.0306	0.693

SS-19 (3")
ND<0.0339

SS-22 (3")
ND<0.0317

SS-66 (3")	SS-66 (1')
ND<0.029	ND<0.0282

SS-63 (3")	SS-63 (6")	SS-63 (1')
ND<0.0256	ND<0.0265	0.623

SS-56 (3")	SS-56 (6")	SS-56 (1')
ND<0.0275	ND<0.0269	ND<0.0268

SS-53 (3")	SS-53 (6")	SS-53 (1')
ND<0.0267	ND<0.0267	ND<0.0278

SS-75 (3")	SS-75 (1')
0.0481	0.664

SS-86 (3")	SS-86 (1')
ND<0.0355	2.52

SS-79 (3")	SS-79 (1')
ND<0.0326	0.699

SS-16 (3")
0.424

SS-61 (3")	SS-61 (1')
ND<0.032	ND<0.0327

SS-25 (3")
0.0906

SS-55 (3")	SS-55 (6")	SS-55 (1')
ND<0.0263	ND<0.027	ND<0.0278

SS-76 (3")	SS-76 (1')
ND<0.031	ND<0.0274

SS-15 (3")
0.088

SS-12 (3")
0.477

SS-88 (3")	SS-88 (1')
ND<0.0318	0.229

SS-85 (3")	SS-85 (1')
ND<0.0299	0.71

SS-21 (3")
0.199

SS-62 (3")	SS-62 (1')
ND<0.0337	ND<0.0314

SS-54 (3")	SS-54 (1')
ND<0.027	ND<0.0264

SS-77 (3")	SS-77 (1')
ND<0.0327	ND<0.0313

SS-91 (3")	SS-91 (1')
ND<0.0358	0.59

SS-18 (3")
0.0536

SS-83 (3")	SS-83 (1')
ND<0.0376	ND<0.031

SS-64 (3")	SS-64 (1')
ND<0.0311	0.271

SS-89 (3")	SS-89 (1')
ND<0.0327	ND<0.0298

SS-11 (3")
0.279

SS-65 (3")	SS-65 (1')
ND<0.0302	0.529

SS-14 (3")	DUP-1 (SS-14 (3"))
0.0936	0.15

SS-17 (3")
0.0988

SS-90 (3")	SS-90 (1')
ND<0.0268	0.766

SS-80 (3")	SS-80 (1')
ND<0.029	0.286

SS-13 (3")
ND<0.0308

SS-93 (3")	SS-93 (1')
ND<0.0299	ND<0.0306

SS-10 (3")
ND<0.0394

SS-94 (3")	SS-94 (1')
ND<0.0361	0.927

SS-81 (3")	SS-81 (1')
ND<0.0305	3.35

SS-92 (3")	SS-92 (1')
ND<0.0295	0.388

SS-84 (3")	DUP-2_6.9.17 (SS-84 (3"))	SS-84 (1')
ND<0.0343	ND<0.0345	0.376

SS-9 (3")
ND<0.00259

SS-105 (3")	DUP-3_6.9.17 (SS-105 (3"))	SS-105 (1')
ND<0.0288	ND<0.0272	2.61

SS-82 (3")	SS-82 (1')
ND<0.033	ND<0.031

SS-101 (3")	SS-101 (6")	SS-101 (1')
ND<0.027	0.0415	0.0383

SS-96 (3")	SS-96 (1')
ND<0.0291	21.7

SS-95 (3")	SS-95 (1')
ND<0.035	ND<0.031

SS-100 (3")	SS-100 (6")	SS-100 (1')
ND<0.0281	ND<0.0305	0.0336

SS-99 (3")	SS-99 (6")	SS-99 (1')
ND<0.0268	ND<0.0289	0.0956

SS-102 (3")	SS-102 (6")	SS-102 (1')
ND<0.0269	ND<0.0297	0.815

SS-98 (3")	SS-98 (6")	SS-98 (1')
ND<0.0269	ND<0.0299	0.584

SS-104 (3")	SS-104 (1')
ND<0.0318	1.91

SS-103 (3")	SS-103 (6")	SS-103 (1')
ND<0.0264	ND<0.0285	7.1

SS-97 (3")	SS-97 (6")	SS-97 (1')
ND<0.0267	ND<0.0288	ND<0.0288

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. SURFICIAL SOIL SAMPLES WERE COLLECTED AT 3 INCHES BELOW TOPSOIL COVER AND 1 FOOT BELOW TOPSOIL COVER.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
3. MG/KG = MILLIGRAMS PER KILOGRAM
4. ND = NON-DETECT
5. PCB = POLYCHLORINATED BIPHENYLS

ANALYTICAL RESULT TAG KEY

SOILS WITH PCBs > 1 MG/KG

SOILS WITH PCBs > 50 MG/KG

Sample ID with Sample Depth ("=inches, '=feet)

Total PCBs Concentration in mg/kg

25 0 5 10 15 20 25
SCALE IN FEET

PROJECT NO. 140148201

SUBMISSION DATE: FEBRUARY 2018

LANGAN

LANGAN
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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: SURFICIAL SOIL PCB ANALYTICAL RESULTS MAP

Project No.	140148201
Date	FEBRUARY 2018
Scale	1" = 25'
Drawn By	JPH
Checked By	RJW
Submission Date	FEBRUARY 2018

Drawing No. 5

Sheet 8 of 15

Filename: \langan.com\data\WHA\data2\140148201\Cadd\Data - 140148201\25-Design\Files\140148201-Western Middle School_Total PCB Tag Map.dwg Date: 2/27/2018 Time: 11:42 User: jhall Style Table: Langan.stb Layout: TAG MAP

Sample ID	HA-SS-21_0-0.25	HA-SS-21_0.5-1	HA-SS-21_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	ND

Sample ID	HA-SS-19_0-0.25	HA-SS-19_0.5-1	HA-SS-19_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0320	0.165	1.11

Sample ID	SS-36	SS-36_1-2	SS-36_2-3	SS-36_3-4	SS-36_4-5	SS-36_5-6	SS-36_6-7	SS-36_7-8
Sample Depth	0-0.25	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Sample Date	7/27/2016	10/15/2018	10/15/2018	10/15/2018	10/15/2018	10/15/2018	10/15/2018	10/15/2018
Pesticides (mg/kg)								
Chlordane	0.778	0.514	0.0833	ND	ND	ND	ND	ND
Metals (mg/kg)								
Arsenic	5.86	20	12.5	8.47	6.59	4.8	5.22	5.34
Lead	110	3,260	1,380	3,590	391	23.9	32.8	90.6
PCBs (mg/kg)								
Total PCBs	0.0457	1.02	0.0609	NT	NT	NT	NT	NT

Sample ID	HA-SS-17_0-0.25	HA-SS-17_0.5-1	HA-SS-17_1-1.5	Dup-3
Sample Depth	0-0.25	0.5-1	1-1.5	HA-SS-17_1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)				
Total PCBs	0.478	0.745	0.404	0.444

Sample ID	HA-SS-22_0-0.25	HA-SS-22_0.5-1	HA-SS-22_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	0.0478	2.71

Sample ID	HA-SS-20_0-0.25	HA-SS-20_0.5-1	HA-SS-20_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.472

Sample ID	HA-SS-18_0-0.25	HA-SS-18_0.5-1	HA-SS-18_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0341	0.187	1.39

Sample ID	HA-SS-15_0-0.25	HA-SS-15_0.5-1	HA-SS-15_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.484	0.688	0.282

Sample ID	SS-43 (3")	SS-43 (1')	SS-43_1-2
Sample Depth	0-0.25	0.75-1	1-2
Sample Date	6/9/2017	6/9/2017	10/16/2018
PCBs (mg/kg)			
Total PCBs	ND	3.62	0.559

Sample ID	SS-23_0-0.25	SS-23_0.5-1	SS-23_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.204

Sample ID	HA-SS-24_0-0.25	HA-SS-24_0.5-1	HA-SS-24_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.461

Sample ID	SS-58 (3")	SS-58 (1')	SS-58_1-2	SS-58_2-3
Sample Depth	0-0.25	0.75-1	1-2	2-3
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
SVOCs (mg/kg)				
Benzo(a)anthracene	NT	NT	1.5	25.6
Benzo(a)pyrene	NT	NT	1.54	24
Benzo(b)fluoranthene	NT	NT	1.23	18.8
Benzo(k)fluoranthene	NT	NT	1.21	20.8
Pyrene	NT	NT	2.25	52.2
Pesticides (mg/kg)				
Dieldrin	NT	NT	0.21	ND
Metals (mg/kg)				
Arsenic	NT	NT	26	16.6
Lead	NT	NT	4,970	1,250
PCBs (mg/kg)				
Total PCBs	ND	1.54	8.72	0.631

Sample ID	SS-11_0-0.25	SS-11_0.5-1	SS-11_1-1.5	Dup-2
Sample Depth	0-0.25	0.5-1	1-1.5	SS-11_1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018	10/17/2018
PCBs (mg/kg)				
Total PCBs	0.978	10.1	2.01	3.4

Sample ID	HA-SS-13_0-0.25	HA-SS-13_0.5-1	HA-SS-13_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.298	0.696	7.4

Sample ID	HA-SS-12_0-0.25	HA-SS-12_0.5-1	HA-SS-12_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.218	0.702	7.16

Sample ID	HA-SS-14_0-0.25	HA-SS-14_0.5-1	HA-SS-14_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.118	0.141	0.0548

Sample ID	HA-SS-16_0-0.25	HA-SS-16_0.5-1	HA-SS-16_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.206	0.0806	0.154

Sample ID	SS-32	SS-32_1-2	SS-32_2-3	SS-32_3-4	SS-32_4-5
Sample Depth	0-0.25	1-2	2-3	3-4	4-5
Sample Date	7/27/2016	10/16/2018	10/16/2018	10/16/2018	10/16/2018
VOCs (mg/kg)					
Trichloroethylene	NT	NT	3.7	NT	NT
Metals (mg/kg)					
Arsenic	3.49	23.2	43.6	15.9	3.81
Lead	7.74	3,640	22,900	2,290	39.3
Vanadium	20.8	133	NT	486	91.1
PCBs (mg/kg)					
Total PCBs	ND	172	40	1.6	1.35

Sample ID	SS-61 (3")	SS-61 (1')	SS-61_1-2	SS-61_2-3	SS-61_3-4	SS-61_4-5
Sample Depth	0-0.25	0.75-1	1-2	2-3	3-4	4-5
Sample Date	6/9/2018	6/9/2018	10/16/2018	10/16/2018	10/16/2018	10/16/2018
Pesticides (mg/kg)						
Dieldrin	NT	NT	0.0107	NT	NT	NT
Heptachlor epoxide	NT	NT	0.0342	NT	NT	NT
Metals (mg/kg)						
Arsenic	NT	NT	17.1	16.9	29.7	15
Lead	NT	NT	1,760	2,260	2,650	2,100
PCBs (mg/kg)						
Total PCBs	ND	ND	0.221	NT	NT	NT

Sample ID	SS-81 (3")	SS-81 (1')	SS-81_1-2	SS-81_2-3	SS-81_3-4
Sample Depth	0-0.25	0.75-1	1-2	2-3	3-4
Sample Date	6/9/2018	6/9/2018	10/16/2018	10/16/2018	10/16/2018
VOCs (mg/kg)					
Trichloroethylene	NT	NT	7.5	NT	NT
Metals (mg/kg)					
Arsenic	NT	NT	22.8	15.8	5.53
Lead	NT	NT	3,010	13,700	1,230
PCBs (mg/kg)					
Total PCBs	ND	3.35	0.681	NT	NT

Sample ID	SS-86 (3")	SS-86 (1')	SS-86_1-2	SS-86_2-2.5	SS-86_2.5-3
Sample Depth	0-0.25	0.75-1	1-2	2-2.5	2.5-3
Sample Date	6/9/2017	6/9/2017	10/15/2018	10/15/2018	10/15/2018
VOCs (mg/kg)					
Tetrachloroethylene	NT	NT	2.7	NT	NT
Trichloroethylene	NT	NT	53	NT	NT
Pesticides (mg/kg)					
Dieldrin	NT	NT	0.00916	NT	NT
Metals (mg/kg)					
Antimony	NT	NT	58.5	ND	ND
Arsenic	NT	NT	18.2	8.31	2.8
Cadmium	NT	NT	38.9	8.58	0.586
Copper	NT	NT	2,600	502	27.3
Lead	NT	NT	3,440	1,720	17.4
PCBs (mg/kg)					
Total PCBs	ND	2.52	0.194	NT	NT

Sample ID	SS-11	SS-11_1-2
Sample Depth	0-0.25	1-2
Sample Date	7/27/2016	10/15/2018
PCBs (mg/kg)		
Total PCBs	0.279	0.368

Sample ID	SS-95 (3")	SS-95 (1')	SS-95_1-2
Sample Depth	0-0.25	0.75-1	1-2
Sample Date	6/9/2017	6/9/2017	10/16/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.516

Sample ID	SS-105 (3")	SS-105 (1')	SS-105_1-2	DUP_1
Sample Depth	0-0.25	0.75-1	1-2	SS-105_1-2
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
VOCs (mg/kg)				
Acetone	NT	NT	ND	0.021
SVOCs (mg/kg)	NT	NT	ND	ND
Pesticides (mg/kg)	NT	NT	ND	ND
Herbicides (mg/kg)	NT	NT	ND	ND
ETPH (mg/kg)	NT	NT	ND	ND
Metals (mg/kg)	NT	NT	NE	NE
PCBs (mg/kg)				
Total PCBs	ND	2.61	0.0633	ND

Sample ID	HA-SS-1_0-0.25	HA-SS-1_0.5-1	HA-SS-1_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	0.633	1.35

Sample ID	HA-SS-2_0-0.25	HA-SS-2_0.5-1	HA-SS-2_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.0598

Sample ID	SS-104 (3")	SS-104 (1')	SS-104_1-2	SS-104_2-3
Sample Depth	0-0.25	0.75-1	1-2	2-3
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
PCBs (mg/kg)				
Total PCBs	ND	1.91	5.08	ND

Sample ID	HA-SS-3_0-0.25	HA-SS-3_0.5-1	HA-SS-3_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0792	0.475	1.24

Sample ID	HA-SS-4_0-0.25	HA-SS-4_0.5-1	HA-SS-4_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.131

Sample ID	HA-SS-6_0-0.25	HA-SS-6_0.5-1	HA-SS-6_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	ND

Sample ID	HA-SS-5_0-0.25	HA-SS-5_0.5-1	HA-SS-5_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0867	1.27	0.732

Sample ID	SS-103 (3")	SS-103 (1')	SS-103_1-2	SS-103_2-3	SS-103_3-4	SS-103_4-5	SS-103_5-6
Sample Depth	0-0.25	0.75-1	1-2	2-3	3-4	4-5	5-6
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018	10/16/2018	10/16/2018	10/16/2018
PCBs (mg/kg)							
Total PCBs	ND	ND	2.48	2.9	ND	ND	0.251

Sample ID	SS-96 (3")	SS-96 (1')	SS-96_1-2	SS-96_2-3
Sample Depth	0-0.25	0.75-1	1-2	2-3
Sample Date	6/9/2017	6/9/2017	10/16/2018	10/16/2018
PCBs (mg/kg)				
Total PCBs	ND	21.7	3.3	ND

Sample ID	HA-SS-9_0-0.25	HA-SS-9_0.5-1	HA-SS-9_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	0.436	0.765

Sample ID	HA-SS-10_0-0.25	HA-SS-10_0.5-1	HA-SS-10_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.192

Sample ID	HA-SS-7_0-0.25	HA-SS-7_0.5-1	HA-SS-7_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/17/2018	10/17/2018	10/17/2018
PCBs (mg/kg)			
Total PCBs	0.0844	0.621	1.12

Sample ID	HA-SS-8_0-0.25	HA-SS-8_0.5-1	HA-SS-8_1-1.5
Sample Depth	0-0.25	0.5-1	1-1.5
Sample Date	10/15/2018	10/15/2018	10/15/2018
PCBs (mg/kg)			
Total PCBs	ND	ND	0.211

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1–FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1–FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. ONLY PCB RESULTS AND EXCEEDANCES OF THE CTDEEP RSR RESIDENTIAL DIRECT EXPOSURE CRITERIA AND POLLUTANT MOBILITY CRITERIA FOR GB ARE SHOWN.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
3. MG/KG = MILLIGRAMS PER KILOGRAM
4. MG/L = MILLIGRAMS PER LITER
5. ND = NON-DETECT
6. NT = NOT TESTED
7. NE = NOT EXCEEDING CRITERIA
8. PCB = POLYCHLORINATED BIPHENYLS
9. VOCs = VOLATILE ORGANIC COMPOUNDS
10. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS

ANALYTICAL RESULT TAG KEY

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria
VOCs	mg/kg	mg/kg
Tetrachloroethylene	12	1
Trichloroethylene	56	1
SVOCs	mg/kg	mg/kg
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	8.4	1
Pyrene	1,000	40
Pesticides	mg/kg	mg/kg
Chlordane	0.49	0.066
Dieldrin	0.038	0.007
Heptachlor epoxide	0.067	0.02
Metals	mg/kg	mg/L
Antimony	27	~
Arsenic	10	~
Cadmium	34	~
Copper	2,500	~
Lead	400	~
Vanadium	470	~
PCBs	mg/kg	mg/L
Total PCBs	1	~

Bold indicates an exceedance of the Pollutant Mobility Criteria

Shaded indicates an exceedance of the Residential Direct Exposure Criteria

25 0 5 10 15 20 25
SCALE IN FEET

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
OCTOBER 2018 SOIL INVESTIGATION ANALYTICAL RESULTS MAP

Project No.	140148201
Date	JANUARY 2019
Drawn By	JPH
Checked By	RJW
Drawing No.	6A
Sheet	9 of 15

Filename: \langan.com\data\WH\data2\140148201\Cadd Data - 140148201\2D-Design\Rev1\140148201-Western Middle School_2018 10_Soil Tag.dwg Date: 3/20/2019 Time: 17:41 User: jhaff Style Table: Langan.stb Layout: SOIL TAG MAP

PROJECT NO. 140148201

Sample ID	MW-2
Sampling Date	10/30/2018
VOCs (ug/L)	
cis-1,2-Dichloroethylene	5
Tetrachloroethylene	2.1
trans-1,2-Dichloroethylene	3.3
Trichloroethylene	43
ETPH (ug/L)	
ETPH (Extractable Total Petroleum Hydrocarbons)	106
Dissolved Metals (ug/L)	
Barium	93.3
Copper	1.34
Nickel	3.46
Zinc	8.59
PCBs (ug/L)	
Total PCBs	ND

Sample ID	MW-4
Sampling Date	10/30/2018
PCBs (ug/L)	
Total PCBs	ND

Sample ID	MW-3	DUP-01
Sampling Date	10/30/2018	10/30/2018
VOCs (ug/L)		
cis-1,2-Dichloroethylene	15	15
Tetrachloroethylene	3.4	3.4
trans-1,2-Dichloroethylene	3.7	3.7
Trichloroethylene	38	38
ETPH (ug/L)		
ETPH (Extractable Total Petroleum Hydrocarbons)	109	98
Dissolved Metals (ug/L)		
Antimony	1.32	1.23
Barium	101	105
Copper	4.27	4.32
Nickel	1.54	1.38
Selenium	6.52	3.9
Vanadium	2.18	2.13
Zinc	11.9	7.77
PCBs (ug/L)		
Total PCBs	ND	ND

Sample ID	MW-1
Sampling Date	10/30/2018
VOCs (ug/L)	
Chloroform	0.53
cis-1,2-Dichloroethylene	12
Tetrachloroethylene	3.5
trans-1,2-Dichloroethylene	1.9
Trichloroethylene	31
ETPH (ug/L)	
ETPH (Extractable Total Petroleum Hydrocarbons)	122
Dissolved Metals (ug/L)	
Barium	91.8
Copper	1.48
Nickel	2.55
Selenium	2.57
Zinc	11.1
PCBs (ug/L)	
Total PCBs	ND

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
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- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
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- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. ONLY DETECTIONS ARE SHOWN.
2. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
3. UG/L = MICROGRAMS PER LITER
4. ND = NON-DETECT
5. PCB = POLYCHLORINATED BIPHENYLS
6. VOCs = VOLATILE ORGANIC COMPOUNDS
7. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
8. ETPH = EXTRACTABLE TOTAL PETROLEUM HYDROCARBONS

ANALYTICAL RESULT TAG KEY

Compound	SWPC	GWVC
VOCs	ug/L	ug/L
Chloroform	14,100	287
cis-1,2-Dichloroethylene	6,200*	~
Tetrachloroethylene	88	1,500
trans-1,2-Dichloroethylene	10,000*	~
Trichloroethylene	2,340	219
ETPH	ug/L	~
ETPH (Extractable Total Petroleum Hydrocarbons)	~	~
Dissolved Metals	ug/L	~
Antimony	86,000	~
Barium	~	~
Copper	48	~
Nickel	880	~
Selenium	50	~
Vanadium	~	~
Zinc	123	~
PCBs	ug/L	~
Total PCBs	0.5	~

SWPC = Surface Water Protection Criteria
GWVC = Groundwater Volitilization Criteria

25 0 5 10 15 20 25
SCALE IN FEET

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: OCTOBER 2018 GROUNDWATER INVESTIGATION ANALYTICAL RESULTS MAP

Project No. 140148201
Date JANUARY 2019
Drawn By JPH
Checked By RJW

Drawing No. 6B
Sheet 10 of 15

PROJECT NO. 140148201

Filename: \langan.com\data\NY\Data2\140148201\Cadd Data - 140148201\2-Design Files\140148201-Western Middle School_2018 10_Soil Tag.dwg Date: 3/20/2019 Time: 17:42 User: jhall Style Table: Langan.stb Layout: GW TAG MAP

Compound	Residential Direct Exposure Criteria	GB Pollutant Mobility Criteria
VOCs	mg/kg	mg/kg
Acetone	500	140
Metals	mg/kg	mg/kg
Arsenic	10	~
Barium	4700	~
Cadmium	34	~
Chromium, Total	~	~
Copper	2500	~
Lead	400	~
Mercury	20	~
Nickel	1400	~
Vanadium	470	~
Zinc	20000	~

Notes:
1. Imagery provided through Langan's subscription to Nearmap.com. Flown on 06/04/2020.
2. All locations of Site reconnaissance observations are approximate.

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the laboratory reporting limit (RL); the value shown in the table is the RL.
~ = Regulatory limit for this analyte does not exist
Only detections are shown on the figure.

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Project
WESTERN MIDDLE SCHOOL
GREENWICH
FAIRFIELD COUNTY CT

Drawing Title
SOIL ANALYTICAL RESULTS MAP

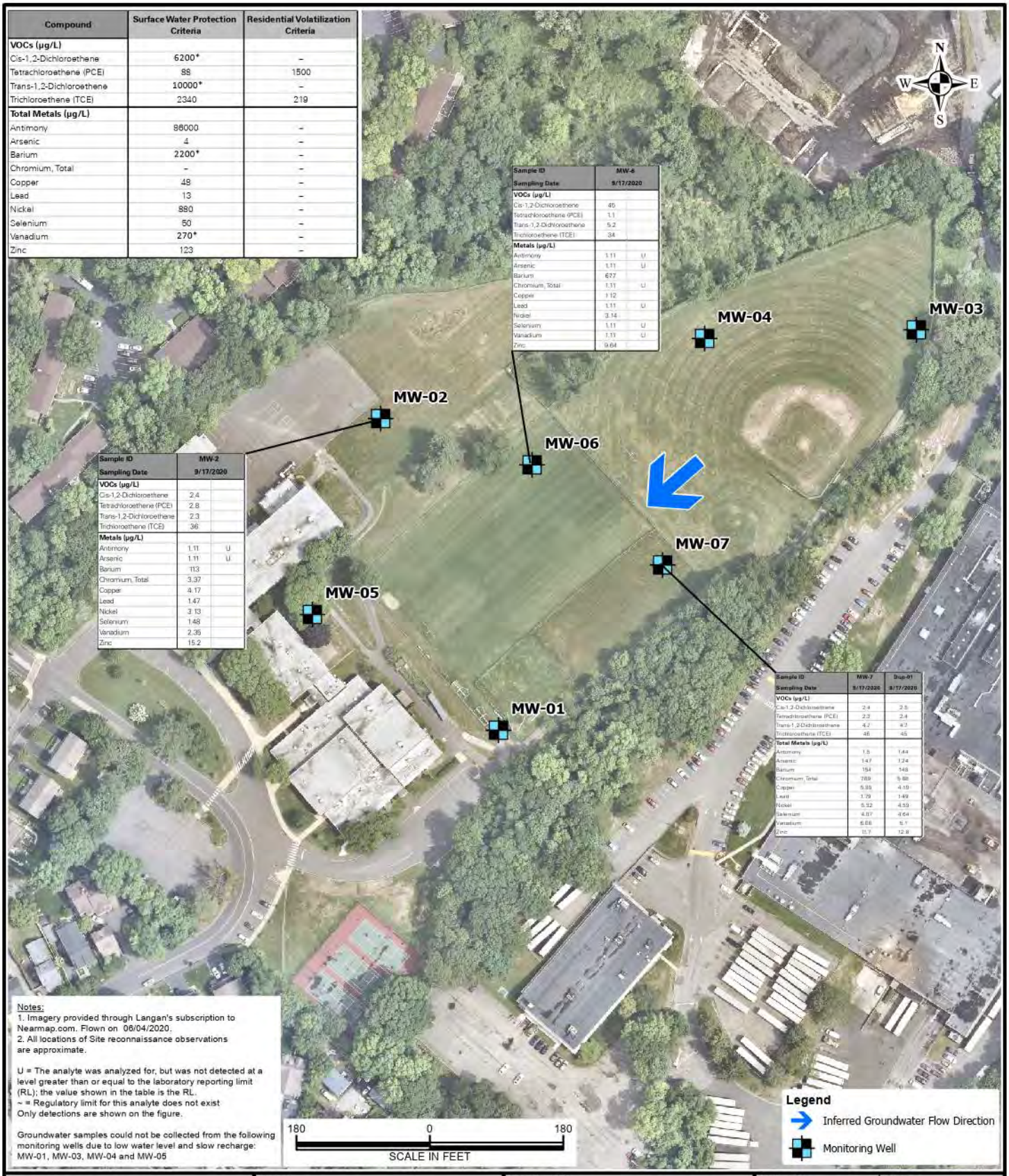
Project No. 140148201
Date 10/1/2020
Scale 1" = 150 feet
Drawn By LDB

Figure 7A

Sheet 11 of 15

Path: C:\Users\lbalch\Desktop\GIS_Projects\NHV\140148201\140148201\140148201.aprx

Compound	Surface Water Protection Criteria	Residential Volatilization Criteria
VOCs (µg/L)		
Cis-1,2-Dichloroethene	6200*	–
Tetrachloroethene (PCE)	88	1500
Trans-1,2-Dichloroethene	10000*	–
Trichloroethene (TCE)	2340	219
Total Metals (µg/L)		
Antimony	86000	–
Arsenic	4	–
Barium	2200*	–
Chromium, Total	–	–
Copper	48	–
Lead	13	–
Nickel	880	–
Selenium	50	–
Vanadium	270*	–
Zinc	123	–



Notes:
1. Imagery provided through Langan's subscription to Nearmap.com. Flown on 06/04/2020.
2. All locations of Site reconnaissance observations are approximate.

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the laboratory reporting limit (RL); the value shown in the table is the RL.
~ = Regulatory limit for this analyte does not exist
Only detections are shown on the figure.

Groundwater samples could not be collected from the following monitoring wells due to low water level and slow recharge: MW-01, MW-03, MW-04 and MW-05

180 0 180
SCALE IN FEET

Legend
- Inferred Groundwater Flow Direction
- Monitoring Well

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Project
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GREENWICH
FAIRFIELD COUNTY CT

Drawing Title
GROUNDWATER ANALYTICAL RESULTS MAP

Project No. 140148201
Date 10/1/2020
Scale 1" = 180 feet
Drawn By LDB

Figure 7B

Path: C:\Users\lbalch\Desktop\GIS_Projects\NHV\140148201\140148201\140148201.aprx

Sample Name	SB-307A	SB-307B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	6-6.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.659**	ND
Chlordane (alpha and gamma)	**0.128**	ND
PCBs (mg/kg)		
Total PCBs	0.0597	ND
Metals (mg/kg)		
Lead	1,570	3.68

Sample Name	SB-306A	SB-306B
Sample Date	8/16/2021	
Sample Depth (ft bg)	1-1.5	4-4.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.012	0.0092
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0331**	**0.06039**
PCBs (mg/kg)		
Total PCBs	1.04	2.8
Metals (mg/kg)		
Lead	678	106

Sample Name	SB-305A	SB-305B
Sample Date	8/16/2021	
Sample Depth (ft bg)	1-1.5	3-3.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.023	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.5593**	ND
PCBs (mg/kg)		
Total PCBs	11	ND
Metals (mg/kg)		
Lead	923	3.79

Sample Name	SB-304A	SB-304B
Sample Date	8/16/2021	
Sample Depth (ft bg)	1-1.5	2-2.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Benzo(a)pyrene	1.1	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0611**	ND
Chlordane (alpha and gamma)	**0.221**	ND
PCBs (mg/kg)		
Total PCBs	1.5	ND
Metals (mg/kg)		
Antimony	48.2	3.63
Arsenic	32.1	3.83
Cadmium	191	1.26
Lead	2,220	231
Nickel	1,060	83.9

Sample Name	SB-303A	SB-303B
Sample Date	8/16/2021	
Sample Depth (ft bg)	2.5-3	5.5-6
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0497**	**0.02507**
Chlordane (alpha and gamma)	**0.0747**	ND
PCBs (mg/kg)		
Total PCBs	0.265	0.0634
Metals (mg/kg)		
Arsenic	11.9	5.2
Lead	943	112

Sample Name	SB-302A	SB-302B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	6.5-7
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0291**	ND
PCBs (mg/kg)		
Total PCBs	1.11	0.0737
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-301A	SB-301B
Sample Date	8/17/2021	
Sample Depth (ft bg)	1-1.5	5-5.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.027	0.0054
SVOCs (mg/kg)		
Benzo(a)anthracene	**1.6**	ND
Benzo(a)pyrene	**1.94**	ND
Benzo(b)fluoranthene	**1.59**	ND
Benzo(g,h,i)Perylene	**1.57**	ND
Benzo(k)fluoranthene	**1.52**	ND
Chrysene	**1.55**	ND
Indeno(1,2,3-cd)pyrene	**1.63**	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1721**	ND
PCBs (mg/kg)		
Total PCBs	0.153	ND
Metals (mg/kg)		
Lead	428	11.8

Sample Name	SB-332A	SB-332B
Sample Date	8/18/2021	
Sample Depth (ft bg)	0.5-1	2-3.5
VOCs (mg/kg)		
Methylene Chloride	ND	0.013
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	Detections BC	
PCBs (mg/kg)		
Total PCBs	0.436	0.0378
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-331A	SB-331B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	4-4.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1171**	ND
Chlordane (alpha and gamma)	**0.0863**	ND
PCBs (mg/kg)		
Total PCBs	0.0519	ND
Metals (mg/kg)		
Arsenic	14.1	7.59
Lead	1,250	126

Sample Name	SB-330A	SB-330B	DUP-SO2
Sample Date	8/18/2021		
Sample Depth (ft bg)	0.5-1	2-3	
VOCs (mg/kg)			
Methylene Chloride	ND	0.022	ND
SVOCs (mg/kg)			
Total SVOCs	ND	ND	ND
Pesticides/Herbicides (mg/kg)			
Total Pesticides/Herbicides	ND	ND	ND
PCBs (mg/kg)			
Total PCBs	ND	ND	0.0571
Metals (mg/kg)			
Total Metals	ND	ND	ND

Sample Name	SB-329A	SB-329B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	4-4.5
VOCs (mg/kg)		
Methylene Chloride	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.3797**	ND
Chlordane (alpha and gamma)	**0.454**	ND
Dieldrin	**0.0438**	ND
PCBs (mg/kg)		
Total PCBs	1.02	ND
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-328A	SB-328B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	2.5-3
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.7373**	**0.3282**
Dieldrin	**0.0445**	**0.0211**
PCBs (mg/kg)		
Total PCBs	2.19	0.465
Metals (mg/kg)		
Arsenic	14	9.85
Lead	701	663

Sample Name	SB-327A	SB-327B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	5-5.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Chlordane (alpha and gamma)	**0.189**	ND
PCBs (mg/kg)		
Total PCBs	2.05	ND
Metals (mg/kg)		
Arsenic	17.5	2.6
Lead	2,020	31.9

Sample Name	SB-326A	SB-326B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1.5-2	3-3.5
VOCs (mg/kg)		
Trichloroethene (TCE)	ND	0.037
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1536**	**0.8724**
Chlordane (alpha and gamma)	ND	**0.619**
Dieldrin	ND	**0.0397**
PCBs (mg/kg)		
Total PCBs	0.736	3.3
Metals (mg/kg)		
Arsenic	6.4	53.1
Lead	207	2,230

Sample Name	SB-325A	SB-325B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	4.5-5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.021	0.02
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0751**	ND
Chlordane (alpha and gamma)	**0.0676**	ND
PCBs (mg/kg)		
Total PCBs	0.515	0.289
Metals (mg/kg)		
Arsenic	12.5	5.01
Lead	2,650	128

Sample Name	SB-324A	SB-324B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	5-5.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.0879**	ND
Chlordane (alpha and gamma)	**0.0865**	ND
PCBs (mg/kg)		
Total PCBs	0.227	ND
Metals (mg/kg)		
Lead	898	8.2

Sample Name	SB-323A	SB-323B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1.5-2	3-3.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1789**	**2.65**
Chlordane (alpha and gamma)	**0.256**	**0.983**
Dieldrin	**0.0176**	ND
PCBs (mg/kg)		
Total PCBs	1.94	5.46
Metals (mg/kg)		
Arsenic	6.18	16.7
Lead	154	1,660

Sample Name	SB-308	DUP_SO1
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-3	
VOCs (mg/kg)		
Trichloroethene	0.049	0.041
SVOCs (mg/kg)		
Benzo(a)anthracene	2.3	ND
Benzo(a)pyrene	2.75	ND
Benzo(b)fluoranthene	2.25	ND
Benzo(g,h,i)Perylene	1.64	ND
Benzo(k)fluoranthene	2.21	ND
Chrysene	2.52	ND
Indeno(1,2,3-cd)pyrene	1.92	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.07132**	**0.0355**
Chlordane (alpha and gamma)	**0.131**	ND
PCBs (mg/kg)		
Total PCBs	0.109	0.244
Metals (mg/kg)		
Lead	697	603

Sample Name	SB-309A	SB-309B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	3.5-4
VOCs (mg/kg)		
Trichloroethene (TCE)	0.038	0.04
SVOCs (mg/kg)		
Total SVOCs	Detections BC	
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1611**	ND
Chlordane (alpha and gamma)	**0.301**	**1.37**
PCBs (mg/kg)		
Total PCBs	1.19	11.9
Metals (mg/kg)		
Copper	3,580	231
Lead	1,220	733

Sample Name	SB-310A	SB-310B
Sample Date	8/17/2021	
Sample Depth (ft bg)	1-1.5	3-3.5
VOCs (mg/kg)		
Trichloroethene (TCE)	0.024	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.04505**	ND
PCBs (mg/kg)		
Total PCBs	0.632	ND
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-311A	SB-311B
Sample Date	8/17/2021	
Sample Depth (ft bg)	1-2.5	5.5-6
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1017**	ND
Chlordane (alpha and gamma)	**0.238**	ND
PCBs (mg/kg)		
Total PCBs	1.14	0.434
Metals (mg/kg)		
Antimony	29.2	6.27
Arsenic	24.4	2.49
Lead	28,100	5.83

Sample Name	SB-312A	SB-312B
Sample Date	8/17/2021	
Sample Depth (ft bg)	2-2.5	5.5-6
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Benzo(a)anthracene	**1.85**	ND
Benzo(a)pyrene	**1.94**	ND
Benzo(b)fluoranthene	**1.7**	ND
Benzo(g,h,i)Perylene	**1.39**	ND
Benzo(k)fluoranthene	**1.59**	ND
Chrysene	**1.74**	ND
Indeno(1,2,3-cd)pyrene	**1.51**	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.5048**	ND
Chlordane (alpha and gamma)	**1.06**	ND
PCBs (mg/kg)		
Total PCBs	6.43	0.0343
Metals (mg/kg)		
Arsenic	17.8	4.64
Lead	2,640	31.6

Sample Name	SB-313A	SB-313B
Sample Date	8/23/2021	
Sample Depth (ft bg)	1-1.5	2.5-3
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	ND	**0.2436**
PCBs (mg/kg)		
Total PCBs	0.296	8.29
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-314A	SB-314B
Sample Date	8/17/2021	
Sample Depth (ft bg)	0.5-1	1.5-2
VOCs (mg/kg)		
Naphthalene	0.014	0.018
SVOCs (mg/kg)		
Benzo(a)anthracene	21.7	8.71
Benzo(a)pyrene	19.3	7.51
Benzo(b)fluoranthene	15.6	5.89
Benzo(g,h,i)Perylene	10.8	4.28
Benzo(k)fluoranthene	15.3	6.47
Chrysene	18.6	7.45
Dibenz(a,h)anthracene	4.27	1.8
Indeno(1,2,3-cd)pyrene	12.7	5.53
Phenanthrene	45.9	17
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.3212**	**0.1718**
PCBs (mg/kg)		
Total PCBs	2.07	1.42
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-315A	DUP-SO3	SB-315B
Sample Date	8/23/2021		
Sample Depth (ft bg)	1-1.5		2-2.5
VOCs (mg/kg)			
Total VOCs	ND	ND	ND
SVOCs (mg/kg)			
Benzo(a)anthracene	ND	**10.8**	ND
Benzo(a)pyrene	ND	**7.8**	ND
Benzo(g,h,i)Perylene	ND	**4.52**	ND
Benzo(k)fluoranthene	ND	**6.21**	ND
Chrysene	ND	**11**	ND
Dibenz(a,h)anthracene	ND	**1.71**	ND
Indeno(1,2,3-cd)pyrene	ND	**3.8**	ND
Pesticides/Herbicides (mg/kg)			
DDT (Total)	ND	**0.1724**	ND
PCBs (mg/kg)			
Total PCBs	6.68	8.91	4.69
Metals (mg/kg)			
Total Metals	Detections BC		

Sample Name	SB-316A	SB-316B
Sample Date	8/23/2021	
Sample Depth (ft bg)	1-1.5	3-3.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	0.498	0.381
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-318A	SB-318B
Sample Date	8/23/2021	
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	0.884	0.385
Metals (mg/kg)		
Arsenic	7.87	25.1

Sample Name	SB-319A	SB-319B
Sample Date	8/23/2021	
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
Chlordane (alpha and gamma)	ND	**1.36**
PCBs (mg/kg)		
Total PCBs	1.52	12.8
Metals (mg/kg)		
Total Metals	Detections BC	

Sample Name	SB-317A	SB-317B
Sample Date	8/18/2021	
Sample Depth (ft bg)	2-2.5	5.5-6
VOCs (mg/kg)		
Trichloroethene (TCE)	0.039	0.012
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1125**	ND
Chlordane (alpha and gamma)	**0.254**	**0.0768**
Dieldrin	**0.0258**	ND
PCBs (mg/kg)		
Total PCBs	1.43	0.147
Metals (mg/kg)		
Arsenic	14	8.16
Lead	2,000	519

Sample Name	SB-320A	SB-320B
Sample Date	8/23/2021	
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Total VOCs	Detections BC	
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1148**	ND
Chlordane (alpha and gamma)	ND	**0.69**
PCBs (mg/kg)		
Total PCBs	5.56	7.81
Metals (mg/kg)		
Antimony	4.35	34.4
Arsenic	7.43	12.7
Lead	1,820	5,890

Sample Name	SB-321A	SB-321B
Sample Date	8/18/2021	
Sample Depth (ft bg)	0.5-1	1.5-2
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Fluoranthene	ND	0.551
Pesticides/Herbicides (mg/kg)		
Total Pesticides/Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	51.1	26.3
Metals (mg/kg)		
Lead	676	808

Sample Name	SB-322A	SB-322B
Sample Date	8/18/2021	
Sample Depth (ft bg)	1-1.5	2.5-3
VOCs (mg/kg)		
Total VOCs	ND	ND
SVOCs (mg/kg)		
Total SVOCs	ND	ND
Pesticides/Herbicides (mg/kg)		
DDT (Total)	**0.1751**	ND
PCBs (mg/kg)		
Total PCBs	8.54	36.6
Metals (mg/kg)		
Arsenic	7.69	11.1
Lead	181	648

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1–FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1–FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH
- 2021 SOIL BORING LOCATIONS
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- WESTERN MIDDLE SCHOOL PROPERTY LINE
- FENCE LINE
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
2. MG/KG = MILLIGRAMS PER KILOGRAM
3. MG/L = MILLIGRAMS PER LITER
4. ND = NON-DETECT
5. NT = NOT TESTED
6. NC = NOT EXCEEDING CRITERIA
7. PCB = POLYCHLORINATED BIPHENYLS
8. VOCs = VOLATILE ORGANIC COMPOUNDS
9. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS

Analyte	RDEC	I/CDEC	GB PMC
VOCs (mg/kg)			
Methylene Chloride	82	760	1
Trichloroethene (TCE)	56	520	1
SVOCs (mg/kg)			
Benzo(a)anthracene	1	7.8	1
Benzo(a)pyrene	1	1	1
Benzo(b)fluoranthene	1	7.8	1
Benzo(g,h,i)Perylene	8.4	78	1
Benzo(k)fluoranthene	8.4	78	1
Chrysene	84	780	1
Dibenz(a,h)anthracene	1	1	1
Fluoranthene	1,000	2,500	56
Indeno(1,2,3-cd)pyrene	1	7.8	1
Phenanthrene	1,000	2,500	40
Pesticides/Herbicides (mg/kg)			
4,4'-DDT	1.8	17	0.02
Chlordane (alpha and gamma)	0.49	2.2	0.066
Dieldrin	0.038	0.36	0.007
PCBs (mg/kg)			
Total PCBs	1	10	NS
Metals (mg/kg)			
Antimony	27	8,200	NS
Arsenic	10	10	NS
Cadmium	34	1,000	NS
Copper	2,500	76,000	NS
Lead	400	1,000	NS
Nickel	1,400	7,500	NS

Exceedance Summary:

10 - Result exceeds CTDEEP RSRs Residential Direct Exposure Criteria (RDEC)

10 - Result exceeds CTDEEP RSRs - Industrial/Commercial Direct Exposure Criteria (I/CDEC)

10 - Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria (PMC)

25 0 5 10 15 20 25
SCALE IN FEET

LANGAN
Langan CT, Inc.
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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
AUGUST 2021 ANALYTICAL SUMMARY PLAN

Project No. 140148201
Date AUGUST 2021
Drawn By JPH
Checked By RJW

Drawing No. 8
Sheet 13 of 15

Filename: \\langan.com\data\NH\data\140148201\Cad\ Data - 140148201\20-Design Files\140148201-Western Middle School_2018.10_Soil Tag.dwg Date: 9/30/2021 Time: 11:21 User: hgreisbach Style Table: Langan.stb Layout: 2021 - Investigation

PROJECT NO. 140148201
LANGAN

Sample Name	SB-348
Sample Date	2/18/2022
Sample Depth (ft bg)	1-2
SVOCs (mg/kg)	
Benzo(a)anthracene	0.748
Benzo(a)pyrene	0.832
Benzo(b)fluoranthene	0.745
Benzo(k)fluoranthene	0.739
Chrysene	0.717
Fluoranthene	1.66
Indeno(1,2,3-cd)pyrene	0.636
Phenanthrene	0.684
Pyrene	1.26
Pesticides/Herbicides (mg/kg)	
4,4'-DDD	0.0192
4,4'-DDE	0.0253
4,4'-DDT	0.131
Chlordane (alpha and gamma)	**0.219**
Heptachlor epoxide	0.0141
Oxadiazon	0.123
ETPH (mg/kg)	
ETPH	199
PCBs (mg/kg)	
Total PCBs	0.0558
Metals (mg/kg)	
Antimony	3.1
Arsenic	2.91
Barium	113
Cadmium	1.18
Chromium	37.3
Copper	103
Lead	338
Mercury	0.39
Nickel	30.1
Silver	1.36
Vanadium	35.8
Zinc	236

Sample Name	SB-349
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.25
VOCs (mg/kg)	
Methylene Chloride	0.014
Metals (mg/kg)	
Antimony	7.72
Arsenic	2.71
Barium	167
Cadmium	0.881
Chromium	73.8
Copper	62
Lead	75.4
Mercury	0.0808
Nickel	33.8
Silver	1.63
Vanadium	54.8
Zinc	143

Sample Name	SB-345
Sample Date	2/18/2022
Sample Depth (ft bg)	1-2
VOCs (mg/kg)	
Methylene Chloride	0.045
Pesticides/Herbicides (mg/kg)	
4,4'-DDE	0.00646
Oxadiazon	0.111
ETPH (mg/kg)	
ETPH	97.5
PCBs (mg/kg)	
Total PCBs	0.606
Metals (mg/kg)	
Antimony	11.1
Arsenic	12.2
Barium	389
Cadmium	3.96
Chromium	147
Copper	194
Lead	297
Mercury	0.261
Nickel	77.4
Silver	1.12
Vanadium	62.9
Zinc	373

Sample Name	SB-352A	SB-352B
Sample Date	2/18/2022	2/18/2022
Sample Depth (ft bg)	0.5-1	1.25-1.5
VOCs (mg/kg)		
Methylene Chloride	0.11	0.011
Pesticides/Herbicides (mg/kg)		
4,4'-DDT	0.00643	ND
Chlordane (alpha and gamma)	0.0419	ND
Oxadiazon	0.327	0.231
ETPH (mg/kg)		
ETPH	188	73.5
Metals (mg/kg)		
Antimony	5.59	5.66
Arsenic	18.1	6.48
Barium	250	175
Cadmium	0.441	0.458
Chromium	42.4	41.2
Copper	46	46.8
Lead	67.4	85.1
Mercury	0.104	0.114
Nickel	25.1	27.2
Silver	0.969	1.05
Vanadium	54.7	55.7
Zinc	247	154

Sample Name	SB-351
Sample Date	2/18/2022
Sample Depth (ft bg)	1-1.5
VOCs (mg/kg)	
Methylene Chloride	0.04
Pesticides/Herbicides (mg/kg)	
Oxadiazon	0.321
Metals (mg/kg)	
Antimony	7.62
Arsenic	23
Barium	289
Cadmium	1.5
Chromium	54.3
Copper	75.4
Lead	111
Mercury	0.146
Nickel	18
Silver	1.11
Vanadium	52.8
Zinc	515

Sample Name	SB-350
Sample Date	2/18/2022
Sample Depth (ft bg)	0.25-0.75
Metals (mg/kg)	
Antimony	6.71
Arsenic	2.52
Barium	199
Cadmium	1.04
Chromium	74
Copper	143
Lead	171
Mercury	0.188
Nickel	31.9
Silver	0.811
Vanadium	42.9
Zinc	187

Sample Name	SB-353
Sample Date	2/18/2022
Sample Depth (ft bg)	0-0.5
VOCs (mg/kg)	
Methylene Chloride	0.01
SVOCs (mg/kg)	
Benzo(b)fluoranthene	0.587
Fluoranthene	0.975
Pyrene	0.695
Pesticides/Herbicides (mg/kg)	
Oxadiazon	0.0254
Metals (mg/kg)	
Antimony	5.47
Barium	115
Chromium	32.4
Copper	31.9
Lead	37.5
Mercury	0.108
Nickel	8.44
Silver	1.43
Vanadium	38.3
Zinc	90.2

Sample Name	SB-347
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.25
Pesticides/Herbicides (mg/kg)	
Oxadiazon	0.0563
ETPH (mg/kg)	
ETPH	117
Metals (mg/kg)	
Arsenic	5.21
Barium	101
Cadmium	0.481
Chromium	18.6
Copper	457
Lead	100
Mercury	0.364
Nickel	13.9
Silver	3.79
Vanadium	39.5
Zinc	123

Sample Name	SB-346
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.5
VOCs (mg/kg)	
Methylene Chloride	0.013
Pesticides/Herbicides (mg/kg)	
4,4'-DDD	0.0439
4,4'-DDT	0.0578
Oxadiazon	**0.015**
Oxazon	0.0431
ETPH (mg/kg)	
ETPH	103
PCBs (mg/kg)	
Total PCBs	1.64
Metals (mg/kg)	
Antimony	13.2
Arsenic	14
Barium	653
Cadmium	11.6
Chromium	328
Copper	4950
Lead	724
Mercury	0.375
Nickel	153
Silver	3.02
Vanadium	58.1
Zinc	679

Sample Name	SB-360
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1.25
SVOCs (mg/kg)	
Benzo(a)anthracene	0.677
Chrysene	0.654
Fluoranthene	1.69
Phenanthrene	1.1
Pyrene	1.7
PCBs (mg/kg)	
Total PCBs	0.47
Metals (mg/kg)	
Antimony	4.81
Arsenic	9.01
Barium	192
Cadmium	2.46
Chromium	63.5
Copper	112
Lead	223
Mercury	0.27
Nickel	44.1
Silver	0.691
Vanadium	45.1
Zinc	328

Sample Name	SB-358
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1.25
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	0.108
Metals (mg/kg)	
Antimony	7.3
Arsenic	4.18
Barium	180
Cadmium	0.532
Chromium	67.9
Copper	49.6
Lead	85.6
Mercury	0.0713
Nickel	44.4
Vanadium	50.3
Zinc	197

Sample Name	SB-359
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1.5
SVOCs (mg/kg)	
Chrysene	0.608
Fluoranthene	1.21
Pyrene	1.22
PCBs (mg/kg)	
Total PCBs	0.389
Metals (mg/kg)	
Antimony	6.38
Arsenic	2.11
Barium	228
Cadmium	1.13
Chromium	42.2
Copper	180
Lead	299
Mercury	0.175
Nickel	41.5
Silver	0.732
Vanadium	31.6
Zinc	333

Sample Name	SB-354
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1
VOCs (mg/kg)	
Methylene Chloride	0.039
Pesticides/Herbicides (mg/kg)	
Oxadiazon	0.046
Metals (mg/kg)	
Antimony	7.59
Arsenic	4.24
Barium	151
Cadmium	0.484
Chromium	55.8
Copper	46.2
Lead	95.5
Mercury	0.222
Nickel	15.6
Silver	1.31
Vanadium	53
Zinc	175

Sample Name	SB-341
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1.5
VOCs (mg/kg)	
Methylene Chloride	0.02
Trichloroethylene	0.01
Pesticides/Herbicides (mg/kg)	
Oxadiazon	0.123
Metals (mg/kg)	
Antimony	9.85
Arsenic	2.41
Barium	611
Cadmium	1.99
Chromium	120
Copper	136
Lead	256
Mercury	0.217
Nickel	37.7
Silver	0.953
Vanadium	61.8
Zinc	308

Sample Name	SB-344A	SB-344B
Sample Date	2/18/2022	2/18/2022
Sample Depth (ft bg)	0.5-1	1-1.5
VOCs (mg/kg)		
Methylene Chloride	0.048	0.044
Pesticides/Herbicides (mg/kg)		
4,4'-DDE	ND	0.0387
4,4'-DDT	0.00501	0.00405
Oxadiin	**0.0181**	**0.0164**
Heptachlor	ND	**0.0387**
Oxazon	0.15	0.135
ETPH (mg/kg)		
ETPH	51.9	ND
PCBs (mg/kg)		
Total PCBs	3.36	4.16
Metals (mg/kg)		
Antimony	7.84	12
Arsenic	4.41	6.76
Barium	154	310
Cadmium	2.17	4.19
Chromium	108	174
Copper	133	271
Lead	202	431
Mercury	0.222	67.4
Nickel	31.4	67.4
Silver	1.21	1.91
Vanadium	49.9	78
Zinc	246	396

Sample Name	SB-342
Sample Date	2/18/2022
Sample Depth (ft bg)	1-2
VOCs (mg/kg)	
Acetone	0.046
Methylene Chloride	0.05
Pesticides/Herbicides (mg/kg)	
Oxadiazon	0.143
PCBs (mg/kg)	
Total PCBs	0.657
Metals (mg/kg)	
Antimony	18.5
Arsenic	3.48
Barium	1260
Cadmium	2.85
Chromium	426
Copper	202
Lead	1570
Mercury	0.269
Nickel	44.2
Vanadium	67.6
Zinc	903

Sample Name	SB-343	DUP-1
Sample Date	2/18/2022	
Sample Depth (ft bg)	0-1	
VOCs (mg/kg)		
Acetone	0.017	0.02
Methylene Chloride	0.003	0.015
Pesticides/Herbicides (mg/kg)		
Heptachlor epoxide	**0.078**	ND
Oxazon	0.0936	0.154
PCBs (mg/kg)		
Total PCBs	0.866	0.766
Metals (mg/kg)		
Antimony	9.29	10.2
Arsenic	3.06	4.22
Barium	204	250
Cadmium	1.99	1.98
Chromium	93.7	90.5
Copper	98.1	89.2
Lead	214	199
Mercury	0.165	0.218
Nickel	34.9	81.2
Silver	1.76	2.45
Vanadium	65.8	74.8
Zinc	275	236

Sample Name	SB-339
Sample Date	2/18/2022
Sample Depth (ft bg)	0.25-0.75
VOCs (mg/kg)	
Methylene Chloride	0.1
Pesticides/Herbicides (mg/kg)	
Oxazon	0.0927
Metals (mg/kg)	
Antimony	8.36
Arsenic	4.35
Barium	120
Chromium	54.4
Copper	47.4
Lead	196
Mercury	0.159
Nickel	22.1
Silver	1.51
Vanadium	51.5
Zinc	134

Sample Name	SB-340	DUP-2
Sample Date	2/18/2022	
Sample Depth (ft bg)	1-1.5	
VOCs (mg/kg)		
Methylene Chloride	0.077	0.016
Pesticides/Herbicides (mg/kg)		
Oxazon	0.171	0.203
ETPH (mg/kg)		
ETPH	ND	65.4
PCBs (mg/kg)		
Total PCBs	0.0513	ND
Metals (mg/kg)		
Antimony	9.91	10.2
Arsenic	6.34	3.16
Barium	247	223
Cadmium	1.51	1.12
Chromium	111	106
Copper	186	85.1
Lead	269	196
Mercury	0.915	0.29
Nickel	52.4	46.1
Silver	1.58	1.67
Vanadium	68.8	69.6
Zinc	291	216

Sample Name	SB-338
Sample Date	2/18/2022
Sample Depth (ft bg)	1.25-1.75
VOCs (mg/kg)	
Methylene Chloride	0.021
Metals (mg/kg)	
Antimony	9
Arsenic	1.88
Barium	99.7
Chromium	65.8
Copper	23.5
Lead	9.93
Mercury	0.0393
Nickel	39.2
Silver	1.8
Vanadium	57.7
Zinc	47.7

Sample Name	SB-337
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1
VOCs (mg/kg)	
Methylene Chloride	0.04
Pesticides/Herbicides (mg/kg)	
4,4'-DDD	0.0108
4,4'-DDT	0.0619
Oxazon	0.164
ETPH (mg/kg)	
ETPH	102
PCBs (mg/kg)	
Total PCBs	0.212
Metals (mg/kg)	
Antimony	21.8
Arsenic	12.5
Barium	1040
Cadmium	10.4
Chromium	217
Copper	1740
Lead	2320
Mercury	0.572
Nickel	156
Silver	1.02
Vanadium	81
Zinc	2080

Sample Name	SB-357
Sample Date	3/11/2022
Sample Depth (ft bg)	0.5-1
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Antimony	10.3
Arsenic	2.88
Barium	150
Chromium	81.7
Copper	27.8
Lead	56.5
Mercury	0.139
Nickel	51.6
Silver	0.991
Vanadium	69.6
Zinc	203

Sample Name	SB-330
Sample Date	2/18/2022
Sample Depth (ft bg)	0-1
SVOCs (mg/kg)	
Benzo(a)anthracene	0.711
Benzo(a)pyrene	0.899
Benzo(b)fluoranthene	0.797
Fluoranthene	1.1
Pyrene	0.842
Pesticides/Herbicides (mg/kg)	
4,4'-DDE	0.0134
Chlordane (alpha and gamma)	**0.135**
Oxazon	0.182
ETPH (mg/kg)	
ETPH	71.2
PCBs (mg/kg)	
Total PCBs	1.05
Metals (mg/kg)	
Antimony	17.3
Arsenic	8.84
Barium	1430
Cadmium	17.5
Chromium	234
Copper	1500
Lead	2060
Mercury	1.18
Nickel	204
Silver	3.08
Vanadium	180
Zinc	2410

Sample Name	SB-356
Sample Date	3/11/2022
Sample Depth (ft bg)	0-1
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Antimony	10.8
Arsenic	3.37
Barium	158
Chromium	89.8
Copper	25.2
Lead	72.1
Mercury	0.0943
Nickel	48.6
Silver	0.897
Vanadium	64.7
Zinc	109

Sample Name	SB-334
Sample Date	2/18/2022
Sample Depth (ft bg)	0.75-1.25
VOCs (mg/kg)	
Methylene Chloride	0.063
SVOCs (mg/kg)	
Benzo(a)anthracene	1.38
Benzo(a)pyrene	1.86
Benzo(b)fluoranthene	1.91
Benzo(g,h,i)Perylene	0.658
Benzo(k)fluoranthene	0.999
Chrysene	1.15
Fluoranthene	2.47
Indeno(1,2,3-cd)pyrene	0.831
Phenanthrene	1.59
Pyrene	2.09
Pesticides/Herbicides (mg/kg)	
Oxazon	0.0754
PCBs (mg/kg)	
Total PCBs	0.0309
Metals (mg/kg)	
Antimony	11.4
Barium	322
Cadmium	1.71
Chromium	110
Copper	204
Lead	389
Mercury	0.157
Nickel	60
Vanadium	65.1
Zinc	253

Sample Name	SB-355
Sample Date	3/11/2022
Sample Depth (ft bg)	0.75-1.25
SVOCs (mg/kg)	
SVOCs	ND
PCBs (mg/kg)	
Total PCBs	ND

Sample Name	SB-335
Sample Date	2/18/2022
Sample Depth (ft bg)	0.5-1
VOCs (mg/kg)	
Acetone	0.033
Methylene Chloride	0.03
Pesticides/Herbicides (mg/kg)	
Oxazon	0.0731
Metals (mg/kg)	
Antimony	8.59
Arsenic	3.31
Barium	171
Cadmium	0.788
Chromium	79
Copper	67.8
Lead	187
Mercury	0.186
Nickel	25.9
Silver	2.35
Vanadium	63.2
Zinc	131

Sample Name	SB-333
Sample Date	2/18/2022
Sample Depth (ft bg)	1.5-2
VOCs (mg/kg)	
Methylene Chloride	0.025
Pesticides/Herbicides (mg/kg)	
Oxazon	0.106
Metals (mg/kg)	
Antimony	7.12
Barium	207
Chromium	53.8
Copper	37.7
Lead	51
Nickel	32.9
Silver	0.935
Vanadium	57.8
Zinc	69.3

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1–FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1–FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH)
- AUGUST 2021 SOIL BORING LOCATIONS
- MARCH 2022 SOIL BORING LOCATIONS
- MARCH 2022 MONITORING WELL LOCATIONS
- MARCH 2022 SOIL VAPOR LOCATIONS
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- WESTERN MIDDLE SCHOOL PROPERTY LINE
- FENCE LINE
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

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2. MG/KG = MILLIGRAMS PER KILOGRAM
3. ND = NON-DETECT
4. NT = NOT TESTED
5. NS = NO STANDARD
6. PCB = POLYCHLORINATED BIPHENYLS
7. VOCs = VOLATILE ORGANIC COMPOUNDS
8. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
9. ETPH = EXTRACTABLE PETROLEUM HYDROCARBONS
10. CTDEEP = CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
11. RSRs = REMEDIATION STANDARD REGULATIONS
12. RDEC = RESIDENTIAL DIRECT EXPOSURE CRITERIA
13. I/C DEC = INDUSTRIAL/COMMERCIAL DIRECT EXPOSURE CRITERIA
14. GB PMC = GB POLLUTANT MOBILITY CRITERIA
15. * = FOR THOSE COMPOUNDS THAT DO NOT HAVE CERTAIN CRITERIA ESTABLISHED WITHIN THE CTDEEP RSRS, EFFECTIVE 30 JANUARY 1996 AND 27 JUNE 2013, ADDITIONAL POLLUTING SUBSTANCE CRITERIA MUST BE REQUESTED FOR APPROVAL BY THE CTDEEP. THE DATA WAS COMPARED TO THE CRITERIA LISTED IN THE 10 DECEMBER 2015 (REVISED 12 OCTOBER 2018) TECHNICAL SUPPORT DOCUMENT: RECOMMENDED NUMERIC CRITERIA FOR COMMON ADDITIONAL POLLUTING SUBSTANCES AND CERTAIN ALTERNATIVE CRITERIA.

Analyte	RDEC	I/C DEC	GB PMC
VOCs (mg/kg)			
Acetone	500	1,000	140
Methylene Chloride	92	760	1
Trichloroethene (TCE)	56	520	1
SVOCs (mg/kg)			
Benzo(a)anthracene	1	7.8	1
Benzo(a)pyrene	1	1	1
Benzo(b)fluoranthene	1	7.8	1
Benzo(g,h,i)Perylene	8.4	78	1
Benzo(k)fluoranthene	8.4	78	1
Chrysene	84	780	1
Fluoranthene	1,000	2,500	56
Indeno(1,2,3-cd)pyrene	1	7.8	1
Phenanthrene	1,000	2,500	40
Pyrene	1,000	2,500	40
Pesticides/Herbicides (mg/kg)			
4,4'-DDD	1.8	17	0.02
4,4'-DDE	1.8	17	0.02
4,4'-DDT	1.8	17	0.02
Chlordane (alpha and gamma)	0.49	2.2	0.066
Oxidiin	0.038	0.36	0.007
Heptachlor	0.14	1.3	0.013
Heptachlor epoxide	0.067	0.63	0.02
Oxazon	-	-	-
ETPH (mg/kg)			
ETPH	500	2,500	2,500
PCBs (mg/kg)			
Total PCBs	1	10	NS
Metals (mg/kg)			
Antimony	27	8,200	NS
Arsenic	10	10	NS
Barium	4,700	140,000	NS
Cadmium	34	1,000	NS
Chromium	4,000	51,100	NS
Copper	2,500	76,000	NS
Lead	400	1,000	NS
Mercury	20	610	NS
Nickel	1,400	7,500	NS
Silver	340	10,000	NS
Vanadium	470	14,000	NS
Zinc	20,000	610,000	NS

Exceedance Summary:

Result exceeds CTDEEP RSRs Residential Direct Exposure Criteria (RDEC)

Result exceeds CTDEEP RSRs Industrial/Commercial Direct Exposure Criteria (I/CDEC)

Result exceeds CTDEEP RSRs - GB Pollutant Mobility Criteria (PMC)

SCALE IN FEET

LANGAN

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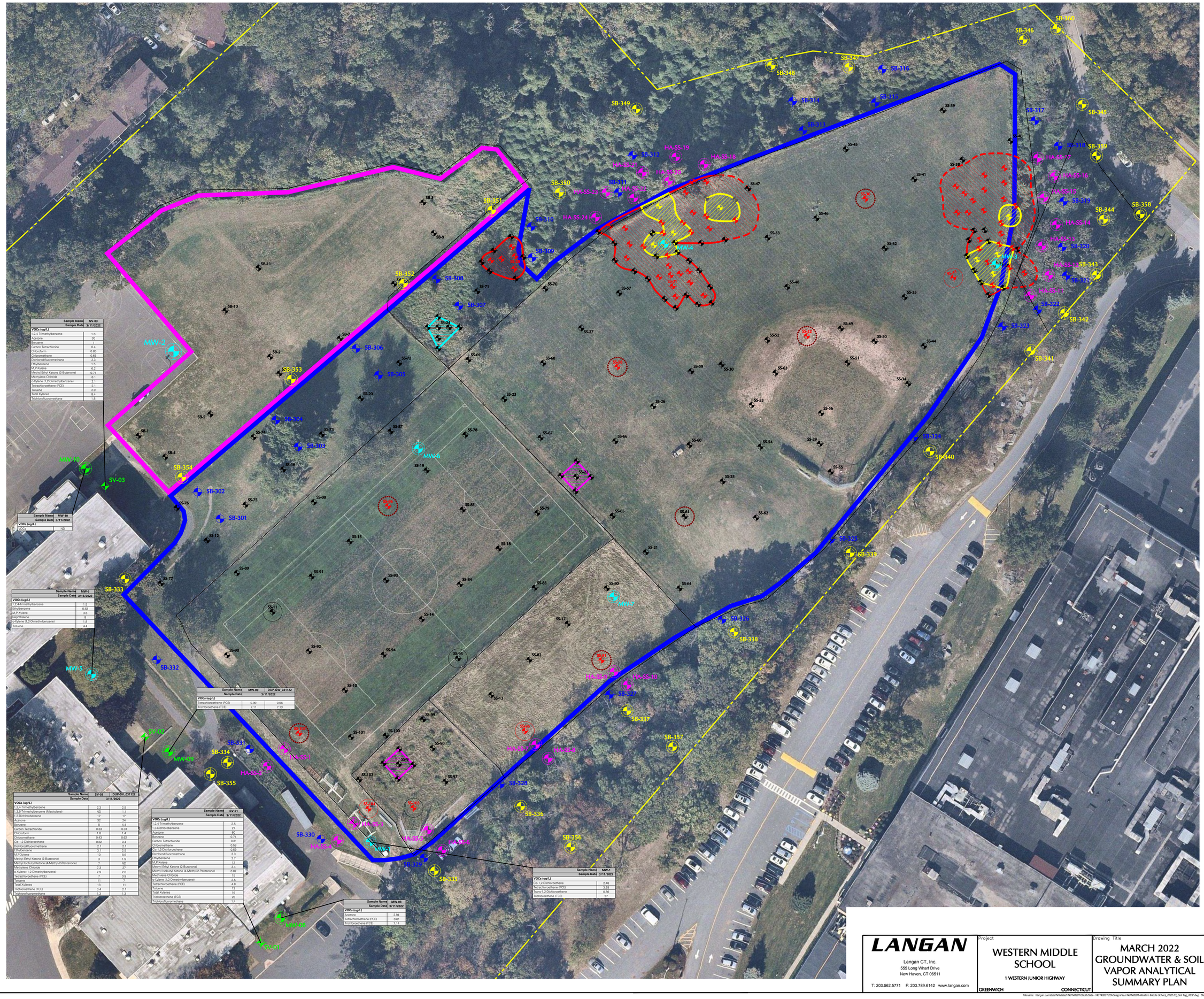
Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: MARCH 2022 SOIL ANALYTICAL SUMMARY PLAN

Project No. 140148201
Date MARCH 2022
Drawn By JPH
Checked By RJW
Drawing No. 9A
Sheet 14 of 15

PROJECT NO. 140148201

Filename: \langan.com\data\NH\data2\140148201\Cad\Data - 140148201\2D-Design\Files\140148201-Western Middle School_2022.03_Soil Tag_REV.dwg Date: 4/3/2022 Time: 23:27 User: jhall Style Table: Langan.stb Layout: 2022 - Soil Investigation



Sample Name	SV-03
Sample Date	3/11/2022
VOCs (ug/L)	
1,2,4-Trimethylbenzene	1.6
Acetone	30
Benzene	1
Carbon Tetrachloride	0.4
Chloroform	0.85
Chloromethane	0.65
Dichlorodifluoromethane	2.3
Ethylbenzene	1.5
M,P-Xylene	6.2
Methyl Ethyl Ketone (2-Butanone)	0.74
Methylene Chloride	6.1
o-Xylene (1,2-Dimethylbenzene)	2.1
Tetrachloroethene (PCE)	2.1
Toluene	2.9
Total Xylenes	8.4
Trichlorofluoromethane	1.8

Sample Name	MW-10
Sample Date	3/11/2022
VOCs (ug/L)	
VOCs	ND

Sample Name	MW-5
Sample Date	3/15/2022
VOCs (ug/L)	
1,2,4-Trimethylbenzene	1.5
Ethylbenzene	0.83
M,P-Xylene	3.6
Naphthalene	8
o-Xylene (1,2-Dimethylbenzene)	1.8
Toluene	4.4

Sample Name	MW-09	DUP-GW_031122
Sample Date	3/11/2022	
VOCs (ug/L)		
Tetrachloroethene (PCE)	0.99	0.96
Trichloroethene (TCE)	7.11	7.13

Sample Name	SV-02	DUP-SV_031122
Sample Date	3/11/2022	
VOCs (ug/L)		
1,2,4-Trimethylbenzene	2.3	2.9
1,3,5-Trimethylbenzene (Mesitylene)	ND	1.1
1,3-Dichlorobenzene	17	17
Acetone	32	24
Benzene	8	4.4
Carbon Tetrachloride	0.33	0.31
Chloroform	1.8	1.4
Chloromethane	0.43	0.62
Cis-1,2-Dichloroethene	0.82	0.4
Dichlorodifluoromethane	2.1	2.1
Ethylbenzene	3.1	2.5
M,P-Xylene	10	8.6
Methyl Ethyl Ketone (2-Butanone)	3	1.9
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	7	ND
Methylene Chloride	7.3	27
o-Xylene (1,2-Dimethylbenzene)	2.9	2.8
Tetrachloroethene (PCE)	7	3.9
Toluene	11	7
Total Xylenes	13	11
Trichloroethene (TCE)	3.4	2.1
Trichlorofluoromethane	1.3	1.3

Sample Name	SV-01
Sample Date	3/11/2022
VOCs (ug/L)	
1,2,4-Trimethylbenzene	2.5
1,3-Dichlorobenzene	27
Acetone	60
Benzene	0.74
Carbon Tetrachloride	0.31
Chloromethane	0.58
Cis-1,2-Dichloroethene	0.59
Dichlorodifluoromethane	3.3
Ethylbenzene	2.7
M,P-Xylene	12
Methyl Ethyl Ketone (2-Butanone)	3.4
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.82
Methylene Chloride	15
o-Xylene (1,2-Dimethylbenzene)	3.5
Tetrachloroethene (PCE)	4.8
Toluene	13
Total Xylenes	16
Trichloroethene (TCE)	28
Trichlorofluoromethane	1.4

Sample Name	MW-08
Sample Date	3/11/2022
VOCs (ug/L)	
Acetone	2.94
Tetrachloroethene (PCE)	0.61
Trichloroethene (TCE)	7.14

Sample Name	MW-1
Sample Date	3/11/2022
VOCs (ug/L)	
Cis-1,2-Dichloroethene	2.48
Tetrachloroethene (PCE)	3.28
Trans-1,2-Dichloroethene	0.86
Trichloroethene (TCE)	27

LEGEND

- SOIL BORING LOCATIONS WITH PCBs < 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 1 MG/KG
- SOIL BORING LOCATIONS WITH PCBs > 50 MG/KG
- BEDROCK MONITORING WELL LOCATION
- SHALLOW SOIL BORING LOCATION
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS > 1 MG/KG AT 1-FOOT BGS)
- VERTICAL DELINEATION SOIL BORING (SOIL BORINGS WITH PCBS < 1 MG/KG AT 1-FOOT BGS)
- SOIL BORINGS WITH BROADER ANALYTE SUITE (VOCS, SVOCS, METALS, PCBS, PESTICIDES, HERBICIDES, AND ETPH)
- AUGUST 2021 SOIL BORING LOCATIONS
- MARCH 2022 SOIL BORING LOCATIONS
- MARCH 2022 MONITORING WELL LOCATIONS
- MARCH 2022 SOIL VAPOR LOCATIONS
- WESTERN MIDDLE SCHOOL ATHLETIC FIELDS BOUNDARY
- WESTERN MIDDLE SCHOOL RECREATIONAL AREA BOUNDARY
- INFERRED EXCAVATION EXTENTS; TO BE CONFIRMED FOLLOWING FURTHER DELINEATION SAMPLING
- WESTERN MIDDLE SCHOOL PROPERTY LINE
- FENCE LINE
- APPROXIMATE EXCAVATION AREA OF PCBs > 1 MG/KG
- APPROXIMATE EXCAVATION AREA OF PCBs > 50 MG/KG
- APPROXIMATE LOCATION OF CHLORDANE EXCEEDANCE AREA EXCAVATION
- APPROXIMATE LOCATION OF LEAD EXCEEDANCE AREA EXCAVATION

NOTES

1. BASEMAP TAKEN FROM NEARMAP US, INC. ON 17 AUGUST 2017.
2. MG/KG = MILLIGRAMS PER KILOGRAM
3. MG/L = MILLIGRAMS PER LITER
4. UG/L = MICROGRAMS PER LITER
5. UG/M3 = MICROGRAMS PER CUBIC METER
6. ND = NON-DETECT
7. NT = NOT TESTED
8. NS = NO STANDARD
9. PCB = POLYCHLORINATED BIPHENYLS
10. VOCs = VOLATILE ORGANIC COMPOUNDS
11. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
12. ETPH = EXTRACTABLE PETROLEUM HYDROCARBONS
13. CTDEEP = CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
14. RSRs = REMEDIATION STANDARD REGULATIONS
15. RVC = RESIDENTIAL VOLATILIZATION CRITERIA (GROUNDWATER)
16. SWPC = SURFACE WATER PROTECTION CRITERIA
17. RSVVC = RESIDENTIAL SOIL VAPOR VOLATILIZATION CRITERIA
18. * = FOR THOSE COMPOUNDS THAT DO NOT HAVE CERTAIN CRITERIA ESTABLISHED WITHIN THE CTDEEP RSRS, EFFECTIVE 30 JANUARY 1996 AND 27 JUNE 2013, ADDITIONAL POLLUTING SUBSTANCE CRITERIA MUST BE REQUESTED FOR APPROVAL BY THE CTDEEP. THE DATA WAS COMPARED TO THE CRITERIA LISTED IN THE 10 DECEMBER 2015 (REVISED 12 OCTOBER 2018) TECHNICAL SUPPORT DOCUMENT; RECOMMENDED NUMERIC CRITERIA FOR COMMON ADDITIONAL POLLUTING SUBSTANCES AND CERTAIN ALTERNATIVE CRITERIA.

Groundwater Criteria		
Analyte	RVC	SWPC
VOCs (ug/L)		
1,2,4-Trimethylbenzene	940*	190*
1,2-Dibromoethane (Ethylene Dibromide)	0.3	NS
Acetone	50000	10000*
Cis-1,2-Dichloroethene	NS	6200*
Ethylbenzene	50000	580000
M,P-Xylene	NS	NS
Naphthalene	NS	210*
o-Xylene (1,2-Dimethylbenzene)	NS	NS
Tetrachloroethene (PCE)	340	88
Toluene	22500	4000000
Trans-1,2-Dichloroethene	NS	10000*
Trichloroethene (TCE)	27	2340
Exceedance Summary:		
Result exceeds CTDEEP RSRs Residential Volatilization Criteria (RVC)		
Result exceeds CTDEEP RSRs - Surface Water Protection Criteria (SWPC)		

Soil Vapor Criteria	
Analyte	RSVVC
VOCs (ug/L)	
1,2,4-Trimethylbenzene	20000*
1,3,5-Trimethylbenzene (Mesitylene)	20000*
1,3-Dichlorobenzene	55000
Acetone	140000
Benzene	2500
Carbon Tetrachloride	380
Chloroform	380
Chloromethane	3600*
Cis-1,2-Dichloroethene	NS
Dichlorodifluoromethane	39000*
Ethylbenzene	40000
M,P-Xylene	NS
Methyl Ethyl Ketone (2-Butanone)	370000
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	28000
Methylene Chloride	2300
o-Xylene (1,2-Dimethylbenzene)	NS
Tetrachloroethene (PCE)	3800
Toluene	160000
Total Xylenes	170000
Trichloroethene (TCE)	780
Trichlorofluoromethane	280000*
Exceedance Summary:	
Result exceeds CTDEEP RSRs Residential Soil Vapor Volatilization Criteria (RSVVC)	

27 0 10 20 27
SCALE IN FEET

LANGAN

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Project: WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title: MARCH 2022 GROUNDWATER & SOIL VAPOR ANALYTICAL SUMMARY PLAN

Project No. 140148201
Date MARCH 2022
Drawn By JPH
Checked By RJW

Drawing No. 9B
Sheet 15 of 15

PROJECT NO. 140148201

Filename: \\langan.com\data\NH\data01\140148201\Civil\ Date - 140148201ZD-Design\Files\140148201-Western Middle School_2022.03_Soil Tag_REV.dwg Date: 4/3/2022 Time: 23:28 User: jhall Style Table: Langan.stb Layout: 2022 - GW & SV Investigation

APPENDIX C

Health & Safety Plan

LANGAN

HEALTH AND SAFETY PLAN

for

WESTERN MIDDLE SCHOOL
1 Western Junior Highway
Greenwich, Connecticut

Prepared For:

Greenwich Public Schools
290 Greenwich Avenue
Greenwich, Connecticut 06830

Prepared By:

Langan CT, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, Connecticut 06511

Ryan J. Wohlstrom
Senior Project Manager

Jamie P. Barr, L.E.P.
Senior Associate/Vice President

August 2022
140148201

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1.0 INTRODUCTION

Langan CT, Inc. (Langan) has prepared this Health and Safety Plan (HASP) to establish personnel protection standards, safety practices, and procedures for the implementation of the Remedial Action Plan (RAP) on behalf of the Greenwich Public Schools (GPS) at the Western Middle School (WMS) property located at 1 Western Junior Highway in Greenwich, Connecticut (the "Subject Property"). The Subject Property is owned by the Town of Greenwich and is improved with the WMS buildings on the southwest portion of the parcel and grass athletic fields and a recreational area on the northeast portion of the parcel. The RAP will address impacts to soil at the Subject Property's athletic fields and recreational area through soil excavation and off-site disposal, construction of Engineered Controls (ECs), and placement of an Environmental Use Restriction (EUR) on the Subject Property.

This HASP has been developed by Langan to comply with Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.120(b)(4), Hazardous Waste Operations and Emergency Response and Langan policies/procedures. In addition, Langan will comply with federal, state, and local regulations as applicable to the project. Compliance with this HASP is required of all Langan personnel and its subcontractors. This HASP will be implemented by Langan personnel while performing remediation related tasks including but not limited to remedial oversight, soil, water, and soil vapor sampling, soil handling activities, heavy machinery oversight, fluid management activities, and various other activities related to the design, oversight, inspection, and management of a large-scale remedial project. The standing orders, which consist of a description of safe work practices that must be followed while onsite by Langan employees and its subcontractors, are provided in Appendix A. These standing orders will be made available to field personnel at all times.

The management of the day-to-day site activities and implementation of this HASP in the field is the responsibility of the site Health and Safety Officer (HSO). Assistance in the implementation of this HASP can also be obtained from the Langan Health and Safety Manager (HSM). The content of this HASP may change or undergo revisions based upon additional information made available to health and safety personnel, monitoring results, or changes in the scope of work. Table 1 briefly describes the health and safety (H&S) designations and general responsibilities based on the personnel roles. The titles have been established to accommodate the project needs.

Langan Engineering and Environmental Services, Inc. (Langan) is committed to providing a safe and healthful work environment. Langan's goal is to be SAFE (Stay Accident Free Everyday), meaning that we strive to complete every project without injury, illness, property damage, or environmental damage. Safety must always take precedence over expediency. No phase of the planned operation is more important than accident prevention. As such, high standards have been followed in developing the safety program for this project. Through adherence to the safety

program, careful planning, and a positive safety attitude by workers, Langan asserts that the safety of people and property is of the utmost importance.

1.1 Site Setting and History

The Subject Property is approximately 21.4-acre parcel identified as Tax ID 057 04-4519/S by the Town of Greenwich Assessor's office. The athletic fields and recreational area, referred to throughout this HASP as areas of concern AOC-1 and AOC-2, respectively, are located on the northeastern portion of the Subject Property and total an approximately 10.4-acre portion of the larger 21.4-acre parcel. The Subject Property is bound to the northwest by a wooded area followed by residential properties, to the north/northeast by a wooded area followed by the Town of Greenwich's Holly Hill Resource Recovery Facility and Muskrat Pond Drive, to the east/southeast by wooded areas followed by several commercial properties, and to the south/southwest by an asphalt-paved parking area and WMS building followed by Western Junior Highway. The athletic fields are situated on an elevated plateau with grades approximately 10 to 20 feet higher than that of the WMS buildings and the recreational area. Utilities provided to the Subject Property include municipal water, stormwater drainage and sanitary sewer, electricity, and communications. Heating is provided by oil-fired boilers; fuel oil for heating is stored on-site in three underground storage tanks (USTs) (5,000-gallon, 7,500-gallon, and 8,000-gallon in size).

Prior to the 1960s, the Subject Property was undeveloped woodlands. During construction of the WMS in the early-1960s, the athletic fields at the Subject Property were filled and graded to meet final design grades using blasted rock (which may have been blasted on-site) and imported fill material of unknown origin. Based on a review of historical aerial photographs and topographic maps, the areas beneath the WMS buildings (which are located at elevations approximately 10 to 20 feet below the athletic fields) are believed to not have been constructed on the imported fill used on the elevated athletic fields. The Subject Property has been used exclusively as the WMS since its construction in the early 1960s.

Environmental assessment, investigation, and delineation activities have been ongoing at the Subject Property since June 2016 with the most recent delineation activities being completed in March 2022. Since June 2016, subsurface investigations have identified volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, metals, and polychlorinated biphenyls (PCBs) at concentrations exceeding state and federal criteria for soils at the Subject Property. As evident from Langan's sampling events, impacts to soil at the Subject Property are attributed to historic fill imported to the Subject Property to raise grades at the athletic fields during construction of the WMS during the early 1960s. Exposure pathways associated with soil impacts at the Subject Property is limited to direct exposure to impacted soil, including ingestion, dermal contact, and inhalation of impacted soil.

The Subject Property was enrolled into the Connecticut Department of Energy and Environmental Protection (CTDEEP) Voluntary Remediation Program (VRP) on 15 June 2020 (Remediation ID No. 14385) following submission of an Environmental Conditions Assessment Form (ECAF) pursuant to Connecticut General Statutes (CGS) Section 22a-133x. The RAP will address impacts to soil at the Subject Property's athletic fields and recreational area through soil excavation and off-site disposal, construction of Engineered Controls (ECs), and placement of an Environmental Use Restriction (EUR) on the Subject Property in accordance with the requirements of a risk-based disposal under the Toxic Substances Control Act (TSCA), as described in Chapter 40 of the Code of Federal Regulations (CRF) Section 761.61(c), and the VRP, as defined by the CGS Section 22a-133x.

1.2 Project Scope and Task Summary

The purpose of this HASP is to establish personnel protection standards and mandatory safety practices and procedures for the implementation of the RAP at the WMS athletic fields (AOC-1) and recreational area (AOC-2). The RAP will include the excavation and off-site disposal of historic fill across AOC-1 to depths of two feet below ground surface (bgs), the excavation and off-site disposal of soil containing PCBs greater than 10 mg/kg regardless of depth, the placement of a minimum of two feet of clean fill over remaining impacted soil to raise grades back to existing conditions, the construction of ECs to render remaining impacted soil inaccessible and physically isolated from human contact, the installation of high-visibility demarcation layers both above and below the ECs, and the placement of an EUR to prohibit actions that would disturb the ECs or expose the remaining impacted soil underlying the ECs. Additionally, remedial activities at AOC-2 will include excavation and off-site disposal of impacted soil at select locations and the backfilling and restoration of remediated areas to its current use of a grass covered recreational area.

This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted during environmental remediation and construction at the Subject Property. Intrusive activities that are either construction-related or related to the remedial action activities that Langan will monitor or conduct include but are not limited to:

- Remedial excavation of soil with heavy machinery;
- Soil handling and loading into trucks;
- Truck transport and unloading;
- Construction of and use of staging and stockpiling areas;
- Community air monitoring for fugitive dust;

- Excavation fluid management (dewatering, storage, disposal, treatment)
- Stormwater management;
- Environmental sampling including waste characterization and verification sampling;
- Construction of ECs and associated high-visibility demarcation layers; and,
- Construction of finished surfaces above ECs (artificial turf, pavement, natural grass).

The provisions of the plan are mandatory for all on-site Langan personnel and its subcontractors. In addition to this plan, all work shall be performed in accordance with all applicable federal, state and local regulations.

2.0 IDENTIFICATION OF KEY PERSONNEL & HEALTH & SAFETY PERSONNEL

The following briefly describes the H&S designations and general responsibilities that may be employed for this site. The personnel titles have been established to accommodate the project needs and requirements and insure the safe conduct of site activities. The H&S personnel requirements for a given work location are based upon the proposed site activities.

2.1 Langan Project Manager

The Langan Project Manager (PM) is Ryan Wohlstrom. His responsibilities include:

- Ensuring that this HASP is developed and approved prior to on-site activities.
- Ensuring that all the tasks in the project are performed in a manner consistent with Langan's Corporate Health and Safety Program and this HASP.

2.2 Langan Corporate Health & Safety Manager

The Langan Corporate Health and Safety Manager (HSM) is Tony Moffa. His responsibilities include:

- Updating the Health and Safety Program.
- Assisting the site Health and Safety Officer (HSO) with development and revisions of the HASP.
- Assisting the HSO in the implementation of this HASP and conducting Jobsite Safety Inspections and assisting with communication of results and correction of shortcomings found.
- Maintaining records on personnel including medical evaluation results, training, certifications, and Incident/Injury reports.

2.3 Langan Site Health & Safety Officer

The Langan Site Health and Safety Officer (HSO) is John Fitzpatrick and the alternate HSO is Dom Livoti. The Site HSO responsibilities include:

- Participating in the development and implementation of this HASP.
- The management of the day-to-day Langan activities and implementation of this HASP in the field.
- Conducting Tailgate Safety Meetings and Jobsite Safety Inspections and correcting any shortcomings in a timely manner.
- Ensuring that proper PPE is available, worn by employees and properly stored and maintained.
- Controlling entry into and exit from the site contaminated areas or zones.
- Monitoring employees for signs of stress, such as heat stress, fatigue, and cold exposure.
- Monitoring site hazards and conditions.
- Knowing (and ensuring that all site personnel also know) emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
- Resolving conflicts that may arise concerning safety requirements and working conditions.
- Reporting all incidents, injuries and near misses to the Langan Incident/Injury Hotline immediately and the client representative.

2.4 Construction Manager & Site Contractor(s) Responsibilities

This HASP has been developed for Langan personnel only; other contractors or subcontractors on-site will develop and abide by their own HASPs, for their personnel. The construction manager and/or general contractor will be responsible for the overall health and safety protocols for the project, and will be the Project Safety Officer (PSO) for this project. The PSO is defined as the person(s) employed by the construction manager or general contractor responsible for the overall health and safety for the overall project. Additionally, the construction manager, general contractor, and all subcontractors must:

- Ensure their employees are trained in the use of all appropriate PPE for the tasks involved;
- Notify Langan of any hazardous material brought onto the job site or site related area, the hazards associated with the material, and must provide a SDS for the material;

- Have knowledge of, understand, and abide by all current federal, state, and local health and safety regulations pertinent to the work;
- Ensure their employees have received current training in the appropriate levels of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER) and other training required for site work;
- Ensure their employees have been medically cleared to work and to wear a respirator, if necessary;
- Ensure their employees have been fit-tested within the year on the type respirator they will wear should use of respirators be required.

3.0 EMERGENCY RESPONSE PLAN

3.1 ERP Scope & Responsibilities

The following Emergency Response Plan (ERP) has been developed to plan for the response to, and management of, emergencies such as injury or chemical exposure to personnel; fire or explosion; environmental release; security threat, or serious weather conditions that may occur during the activities described herein. Standalone Job Safety Analysis Forms have been prepared and attached as Appendix G based on site-specific conditions, and they will be completed during the daily tailgate safety meeting. The site-specific muster point (typically a vehicle), route to hospital, and access considerations are identified on the SSA. In all cases, reference Table 1 for the master emergency notification contact list and Figure 1 for the route to hospital.

3.1.1 Site Emergency Coordinator

The HSO, or their alternate, will serve as the Site Emergency Coordinator and shall implement emergency procedures whenever conditions warrant such action. The Site Emergency Coordinator will be responsible for assuring the evacuation, emergency treatment, emergency transport of site personnel, and the notification of emergency units and the appropriate management staff. Emergency response instructions will be provided by the HSO as part of every employee's training prior to the start of work. Additionally, the HSO will be responsible for accompanying other Langan employees and subcontractors in the exclusion zone.

3.1.2 Employees

All employees at the site will be familiar with emergency response procedures for this project. All Langan employees entering the exclusion zone will be escorted by the HSO.

3.2 Emergency Medical Treatment

Personnel Injury

In case of injury to personnel, the HSO will immediately administer emergency first aid. The ambulance/rescue squad will also be contacted as necessary. Some situations may require transport of the injured parties to the closest emergency medical facility. Therefore, maps/directions to the nearest hospital are provided as Figure 1. Figure 1 will either be posted at the site, or will be made readily available to all personnel at all times.

Personnel Exposure

If there is exposure to a chemical, follow procedures on the corresponding Safety Data Sheet (SDS) attached to Appendix E and seek emergency medical attention/poison control if warranted based on the severity of the exposure. The following provides general emergency first aid procedures for chemical exposure.

Skin Contact

Use ample amounts of soap and water. Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Rinse eyes with water for at least 15 minutes.

Inhalation

Move to fresh air and/or, if necessary decontaminate and transport to emergency medical facility or request the assistance of emergency medical professionals.

Ingestion

Decontaminate and transport to emergency medical facility or request assistance of medical professionals.

Puncture/Laceration

Decontaminate, if possible, and transport to emergency medical facility or request the assistance of emergency medical professionals.

3.3 Non-Emergency Medical Treatment

In case of injury to personnel that is not a medical emergency the employee will contact WorkCare at (1-888-449-7787). WorkCare provides access 24 hours / 7 days a week to experienced occupational health nurses and physicians who confer with employees at the onset of a work-related injury or illness. WorkCare will provide over the phone injury treatment or direct employees to medical treatment by a third party provider, if appropriate.

3.4 Nearest Medical Assistance

The address and telephone number of the nearest hospital/emergency care facility:

Greenwich Hospital Emergency Room
5 Perryridge Road
Greenwich, CT 06830
(203) 863-3637

Map with directions to the hospital/emergency care facility is shown in Figure 1. This information will either be posted prominently at the site or will be available to all personnel all of the time. Further, all field personnel, including the HSO, will know the directions to the hospital.

3.5 Emergency Contacts Notification System

Emergency telephone numbers are summarized in Table 1. This list is to be included with the site first aid kit and readily available to all personnel at all times. Langan requires that all property damage, environmental releases, injuries of any personnel (Langan employees, subcontractors, property owner, site visitors, etc.), and near misses associated with the field activities be reported on the Incident Injury Report located in Appendix C and to Langan's Incident/Injury Hotline at (973-560-4699) as soon as possible following the incident.

3.6 Evacuation

In the event of an emergency situation, an air horn or vehicle horn should be sounded three times indicating the initiation of evacuation procedures. Loud voice command, if appropriate, can be used. All personnel will evacuate and assemble at the site entrance or designated muster point. No one, except the emergency responders, will be allowed to proceed into the area once the emergency signal has been given. The Site Emergency Coordinator will work with the PSO to ensure that access for emergency equipment is provided and that all sources of combustion (e.g., operating machinery, etc.) have been shut down once the alarm has been sounded. Wind direction will be taken into consideration for evacuation plans. Evacuation plans will be discussed at the initial Site-Specific Training and as needed at the regular safety briefings.

In all situations, when an on-site emergency results in an evacuation, personnel shall not re-enter until:

- The conditions resulting in the emergency have been corrected.
- The hazards have been reassessed and determined to no longer pose a potential health threat.
- This HASP has been reviewed.

- Site personnel have been briefed on any changes to this HASP.

3.7 The Buddy System

When working in teams of two or more, workers will use the "buddy system" for all work activities to ensure that rapid assistance can be provided in the event of an emergency. Work groups will be organized so workers can remain close together and maintain visual contact with one another. Workers using the "buddy system" have the following responsibilities:

- Provide his/her partner with assistance.
- Observe his/her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his/her partner's PPE.
- Notify the HSO or other site personnel if emergency service is needed.

3.8 Fire or Explosion

Appropriate fire extinguishers should be made available at the site for trained personnel to use on fires in their initial stage without endangering the safety and health of those nearby. If the use of fire extinguishers will not extinguish the fire, immediately notify the fire department or call 911, sound the evacuation signal, and then evacuate the area, assembling at the site entrance to be accounted for and to receive further instruction. To prevent fires, non-spark tools, grounding, etc. should be used and implemented, as discussed in greater detail below.

3.9 Explosive Atmospheres

Areas deemed to be an explosive atmosphere are to be classified as a confined space/permit required confined space and shall not be entered. Confined space/permit required confined space entry procedures must be followed per Langan's Corporate HASP prior to entering an explosive atmosphere. Langan employees are prohibited from entering or conducting work in a confined space where IDLH conditions are present.

Areas where an explosive atmosphere exist should not be entered until appropriate testing has deemed the area safe for entry and confined space entry procedures have been followed. For explosive atmospheres such as excavation operations, a multi-gas meter equipped for monitoring of VOCs, H2S, LEL, O2, and CO with a remote sensing head should be used.

For LEL readings between 0% to <10%; continue to work and continue to monitor atmosphere. For reading >10% of the LEL; evacuate the area.

3.10 Oxygen Deficient Atmospheres

Areas deemed oxygen deficient are to be considered a confined space/permit required confined space and shall not be entered. Confined space/permit required confined space entry procedures must be followed per Langan's Corporate HASP prior to entering an oxygen deficient atmosphere. Langan employees are prohibited from entering or conducting work in a confined space where IDLH conditions are present.

Areas where oxygen deficient atmospheres exist should not be entered until appropriate testing has deemed the area safe for entry and confined space entry procedures have been followed. Prior to entering any space where an oxygen deficiency may exist, an oxygen meter will be used to test for adequate oxygen levels. Decisions will be based on oxygen concentrations as follows:

Oxygen Concentration	Decision
20.8%	Continue Operations
< 20.8%	Continuous Monitoring
< 19.5%	Stop Work/Do not Enter, withdraw from work area; notify HSM & PM
> 22%	Stop Work/Do not Enter, withdraw from work area; notify HSM & PM

3.11 Spills & Leaks

In the event of accidental spillage, the following spill response protocol will be implemented as follows:

- Immediately stop work and move up-wind of the spill.
- Administer first aid to injured personnel and call 911 if necessary.
- Notify the Langan HSO immediately of the spill. The HSO will notify the project manager who will notify the client and all appropriate outside agencies.
- If possible and safe to do, gather data regarding material spilled, location, quantity spilled, injuries and environmental impacts.
- An exclusion zone will be set up, informing and warning all site personnel of the hazard(s).
- Complete an Incident Injury Report and notify Langan's Incident/Injury Hotline at (973-560-4699) as soon as possible following the incident.

3.12 Adverse Weather Conditions

In the event of severe weather (rain, snow, sleet, heat, etc.), conditions will be assessed on site to determine if the work can proceed safely. If it is determined that the weather poses a significant hazard, site operations will be stopped and rescheduled. Some of the items to be considered prior to determining if work should continue include:

- Potential for heat stress and heat related injuries.
- Potential for cold stress and cold related injuries.
- Treacherous weather related working conditions.
- Limited visibility.

3.13 Underground Utilities Strike

In the event a utility is encountered or disturbed during subsurface work, follow these procedures:

- Immediately stop work;
- Leave the work area and retreat to a safe area;
- Call 911, if necessary;
- Contact the client representative and owner and operator of the property; and
- Immediately notify the Langan PM, HSO and Langan Incident/Injury Hotline.

3.14 Documentation

Employees are required to contact WorkCare at (1-888-449-7787) to document incidents/injuries which are not medical emergencies. Following an incident or near miss, unless emergency medical treatment is required, either the employee, coworker or supervisor must contact the Langan Incident/Injury Hotline at (973-560-4699) and the client representative to report the incident or near miss. For emergencies involving personnel injury and/or exposure, the HSO and affected employee will complete an Incident Injury Report located in Appendix C and submit to Langan's H&S Department as soon as possible following the incident.

4.0 GENERAL HAZARD MANAGEMENT

This section provides an assessment of the general hazards that may be encountered during field work activities at the site through a task by task risk analysis. Potential hazards are addressed below.

4.1 Chemical Exposure Hazards

Known and suspected chemical contaminant hazards that could be encountered during site operations are detailed in Table 2, Part A. A complete inventory of safety data sheets (SDS) for chemical products used on site can be found in Appendix E.

4.2 Physical Hazards

Physical hazards, which may be encountered during site operations for this project, are detailed in Table 2 Part B.

4.3 Biological Hazards

Biological hazards, which may be encountered during site operations for this project, are detailed in Table 2 Part B.

4.4 Task-By-Task Risk Analysis

Through information gathering, inspection, and monitoring; hazards that are potentially present have been determined for each specific task described in Table 2. This table provides a summary of chemical, physical and Biological hazards that could potentially be encountered by personnel during each task effort.

4.5 Job Safety Analysis

A Job Safety Analysis (JSA) is a process to identify existing and potential hazards associated with each job or task so these hazards can be eliminated, controlled or minimized. JSAs will be reviewed at the beginning of each work day, when an employee begins a new task or moves to a new location. JSAs must be developed by the Langan HSO and reviewed by all parties involved. A blank JSA form and documentation of completed JSAs are in Appendix G.

4.6 Job Safety Analysis

Before starting work each day or as needed, the Langan HSO will conduct a tailgate safety briefing for all onsite Langan personnel. This briefing may also be combined with the Project Safety Officers briefing for ALL site personnel, which will be conducted per the PSO and project teams protocols. At a minimum, tailgate meetings will be documented in Appendix H. Briefings will include the following:

- Scope of work for the day,
- Review of safety information relevant to planned tasks and environmental conditions

- New activities/task being conducted;
- Results of Jobsite Safety Inspection Checklist;
- Changes in work practices;
- Safe work practices; and
- Discussion and remedies for noted or observed deficiencies.

4.7 Coronavirus

General Preventative Measures

Field personnel must follow general proper hygiene measures while in the field including:

- Avoid touching eyes, nose and mouth.
- Cover cough or sneeze with tissue, and throw in trash.
- Wash hands often with soap and water for 20 seconds after going to bathroom, before eating, after blowing nose, coughing or sneezing.
- Use hand sanitizer with at least 60% alcohol if soap and water are not available.
- Avoid physical contact with other people (e.g., no handshakes).
- Maintain a safe distance of at least 6 feet from other people (social distancing).
- Wear face coverings when around other worker to minimize spread of COVID-19.

Construction Trailers

Employees should avoid use of shared construction trailers or where employees cannot maintain a safe distance (minimum 6 feet) from other workers. If trailer use is needed, areas such as desks, phones, chairs and other common areas, should be cleaned and disinfected before and after use. Protocols should be developed to minimize trailer use to essential personal, restrict use from any workers who are ill or showing symptoms of being ill, use if face coverings and ensure a safe distance of 6 feet can be established between workers.

Communication

Include Coronavirus topics and prevention topics in daily tailgate meetings to ensure Coronavirus awareness is communicated daily. Discussions can focus on general topics including: social distancing, prevention measures for field personnel, signs and symptoms and recent news on the Coronavirus. Site-specific topics should include minimizing face-to-face contact, disinfecting/sterilizing field equipment, use of PPE to reduce exposure, site security, use of face coverings and other potential exposure issues/concerns.

Sick & Ill Workers

No Langan employee is permitted to be onsite when ill and/or showing potential symptoms of the Coronavirus. Symptoms of the Coronavirus may appear 2-14 days after exposure and can range from mild to severe. The most common symptoms include: fever, fatigue, dry cough, shortness of breath chills, repeated shaking with chills, muscle pain, headache, sore throat, or new loss of taste or smell. If an employee or subcontractor is observed being ill or exhibiting symptoms of Coronavirus, employees must immediately utilize their Stop Work Authority and contact their project manager to address the situation. If an employee observes another worker onsite exhibiting symptoms of Coronavirus, immediately utilize Stop Work Authority and notify their project manager and site construction manager or safety officer. Work should resume when the safety and health of Langan and subcontractors is adequately addressed.

5.0 TRAINING & MEDICAL CLEARANCE REQUIREMENTS

The general training and medical clearance requirements for Langan personnel who may access defined exclusion zone(s) in the field, are discussed in the following sections.

5.1 Project Training

Completion of an initial 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training program as detailed in OSHA's 29 CFR 1910.120(e) is required for all Langan employees who will perform work in areas where the potential for a toxic exposure exists. Annual eight-hour refresher training is also required to maintain competencies to ensure a safe work environment.

Completion of any client/project specific training is required prior to the start of field work and field implementation. Client specific training may include training required for the project that is provided by Langan and/or the Client/Project Team. Training records are maintained by Langan's H&S Department.

5.2 Site Specific Training

Training will be provided to specifically address the activities, procedures, monitoring, and equipment for site operations at the beginning of each field mobilization and the beginning of each discrete phase of work. The training will include the site and facility layout, hazards, and emergency services at the site, and will detail all the provisions contained within this HASP.

5.3 Medical Surveillance

All personnel who will be performing field work involving potential exposure to toxic and hazardous substances will be required to have passed an initial baseline medical examination,

with follow up medical exams thereafter, consistent with 29 CFR 1910.120(f). Medical evaluations will be performed by, or under the direction of, a physician board certified in occupational medicine. Personnel who may be required to perform work while wearing a respirator must receive medical clearance as required under CFR 1910.134(e), Respiratory Protection. Results of medical evaluations are maintained by Langan's H&S Department.

6.0 AIR MONITORING

On-site air monitoring will be conducted to evaluate working conditions, in order to minimize potential exposures to workers and surrounding receptors. The following sections describe air monitoring procedures to be completed during remedial operations.

6.1 Real-Time Dust & VOC Monitoring

During remedial soil excavation and movement activities, qualified environmental personnel will conduct real-time monitoring of dust and VOC levels using direct reading instruments that are designed to monitor air quality on a real-time basis at locations upwind and downwind of excavation and soil movement activities. Background monitoring will be conducted at least 15 minutes prior to the start of intrusive activities at each location. Each monitoring station will include a dust monitor with particulate sensors equipped with filters to detect particulates less than 10 microns in diameter (PM10), the ability to autocorrect for relative air humidity, and a PID equipped with a 10.6 eV (electron-volt) lamp. The monitoring instruments will be calibrated before use. The instruments will be housed within a weatherproof case and the dust monitor will be equipped with an omni-directional probe to minimize wind interference. The dust and VOC data will be logged at 60 second intervals into a cloud based database where real-time dust and VOC data can be reviewed, analyzed, and stored by the environmental personnel. The database will be capable of setting threshold alerts for dust and VOC data that will trigger real-time alerts to environmental personnel mobile phones via email and/or text messages, allowing immediate dust and vapor suppression measure to be implemented. The monitoring data will be downloaded daily and weather and wind information will be noted and recorded.

Visual observation of dust conditions will be also be performed during work activities. If visual observations indicate fugitive dust, the on-site environmental personnel will instruct the contractor to perform dust suppression techniques. These techniques may include water spraying or equivalent measures to reduce the amount of dust generated. Olfactory observations will also be performed during work activities. The contractor will be required to implement odor control measures if needed. These measures may include, but are not limited to, spraying of odor control foams, limiting the amount of open excavation at any one time, and use of odor neutralizers.

6.2 Action Levels

The action level for airborne dust is based on the EPA National Ambient Air Quality Standard (NAAQS) for PM10 particulate of 150 micrograms per cubic meter (µg/m3). The action level for organic vapors will be 5.0 ppm above background in ambient air (sustained for a 15-minute reading).

If particulate levels are 100 µg/m3 greater than background (up-wind) for a 15-minute period, dust suppression must be employed. Work may continue with dust suppression techniques provided PM10 levels do not exceed 150 µg/m3 above background. If, after implementation of dust techniques, PM10 levels are still greater than 150 µg/m3 above background, work must be stopped and a re-evaluation of activities will be initiated. Work may resume provided that dust suppression measures and other controls are successful in reducing the PM10 concentrations to 150 µg/m3 and in preventing visible dust migration.

If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring will be continued. If levels rapidly decrease (per instantaneous readings) below 5 ppm above background, work activities may resume with continued monitoring. If total VOC levels are in excess of 5 ppm above background but are less than 25 ppm, work activities will be halted. The source of vapors will be identified, corrective actions will be taken to abate emissions and monitoring will then continue. If the VOC level is above 25 ppm at the perimeter of the work zone, activities will be shut down.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Langan will provide PPE to workers to protect them from the specific hazards they are likely to encounter on site. Selection of the appropriate PPE must take into consideration: (1) identification of the hazards or suspected hazards; (2) potential exposure routes; and, (3) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards.

7.1 Levels of Protection

Based on anticipated site conditions and the proposed work activities to be performed at the site, Level D Protection will be used. The upgrading/downgrading of the level of protection will be based on continuous air monitoring results as described in Section 6 or based off of the potential exposure to chemicals. The decision to modify standard PPE will be made by the site HSO after conferring with the site project manager. The levels of protection are described below.

Level D Protection

Level D is used when no respiratory protection is required and minimal skin protection is needed (used for nuisance contamination only). The following conditions suggest a need for Level D protection:

- The atmosphere contains no known hazard; and work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

The following constitutes Level D equipment; it may be used as appropriate:

- Coveralls
- Gloves (optional – as applicable).
- Boots/shoes, chemical-resistant steel toe and shank
- Boots, outer, chemical-resistant (disposable) (optional – as applicable).
- Safety glasses or chemical splash goggles (optional – as applicable)
- Hard hat (optional – as applicable)
- Escape mask (optional – as applicable)
- Face shield (optional – as applicable).

Level D Modified

Level D Modified is the same as Level D for respiratory protection, but the skin protection is increased to that of Level C.

Level C Protection

Level C is used when the concentrations and types of airborne substances are known and the criteria for using air purifying respirators are met. The following conditions suggest a need for Level C protection:

- The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin;
- The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants; and

The following constitutes Level C equipment; it may be used as appropriate.

- Full-face or half-mask, air purifying respirators (NIOSH approved).
- Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls)
- Coveralls (optional – as applicable).
- Gloves, outer, chemical-resistant.
- Gloves, inner, chemical-resistant.

- Boots (outer), chemical-resistant steel toe and shank (optional – as applicable).
- Boot-covers, outer, chemical-resistant (disposable) (optional – as applicable).
- Hard hat (optional – as applicable).
- Face shield (optional – as applicable).
- Escape mask (optional – as applicable).

7.2 Respirator Fit-Test

Langan employees who may be exposed to hazardous substances at the work site are in possession of a full or half face piece air purifying respirator, appropriate cartridges and have been successfully fit tested within the past year. Fit test records are maintained by Langan's H&S Department.

8.0 SITE CONTROL

The following Sections summarize practices to implement on-site to reduce the risk of accident and injury.

8.1 Site Communication Plan

The HSO will coordinate on-site communications among Langan personnel and Langan subcontractors. The HSO will keep a log of all Langan personnel on site, including each person's name, company, and mobile telephone number. Should a member of the field crew need to leave the site, they should check in with the HSO prior to leaving. Field personnel will keep the Langan project manager apprised of progress or lack thereof, as needed, and will check in with the Langan project manager prior to leaving the site at the end of each day's field activities.

Should an Unsafe Condition be observed (as defined by Langan's Stop Work Authority [SWA] Policy), Langan HSO and/or employees will exercise Stop Work Authority and the project manager will be informed. In accordance with the Langan SWA Policy, Langan employees shall not initiate a Stop Work Intervention directly with other site personnel. When a Langan employee observes an Unsafe Condition involving other site personnel, the employee should inform the Project Site Officer of the Unsafe Condition. In this situation, Langan employees shall not make recommendations to remedy the Unsafe Condition.

All emergency situations should be communicated to emergency services immediately, if necessary, prior to communicating the same to the project manager or other off-site personnel.

Verbal communications will be the primary method of communication used at the work site. Cell phones shall be used to the extent practical outside of the exclusion zone. Within the exclusion zone, intrinsically safe walkie-talkies will be used for verbal communications. In the instances

where verbal communication cannot be used, such as when working in respiratory protective equipment, hand signals will be used. Hand signals will be covered prior to the start of jobsite work or during tailgate safety meetings.

Hand Signal	Meaning
Hand gripping throat	Out of air; cannot breathe
Grip partners wrists or place both hands around waist	Leave immediately without debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm alright; I understand
Thumbs down	No; negative
Simulated "stick" break with fists	Take a break; stop work

8.2 Work Zones

The need to formally establish specific work zones (Support, Contamination Reduction, and Exclusion Zones) during site activities will be determined by the HSO. A general description of these work zones is provided in Figure 2. It is important for the safety of all concerned that appropriate barriers (cones, wooden horses, plastic fencing etc.) are in place to keep vehicles and pedestrians away from the Work Zone.

8.3 Standing Orders & Safe Work Practices

The standing orders, which consist of a description of safe work practices that must always be followed while on-site by Langan employees and subcontractors, are shown in Appendix A. The site HSO has the responsibility for enforcing these practices. The standing orders will be posted prominently at the site, or are made available to all personnel at all times. Those who do not abide by these safe work practices will be removed from the site.

8.4 Site Security

No unauthorized personnel shall be permitted access to the work areas.

8.5 Underground Utilities

The following safe work practices should be followed before and during subsurface work:

- Obtain available utility drawings from the property owner/client or operator.
- Provide utility drawings to the subcontractors.
- In the field, mark the proposed area of subsurface disturbance (when possible).
- Ensure that the one-call (811) system or state utility hotline in your area has been notified.
- Ensure that utilities are marked before beginning subsurface work.
- Discuss subsurface work locations with the owner/client and subcontractor.
- Obtain approval from the owner/client and operators for proposed subsurface work locations.
- Use safe digging procedures when applicable.
- Stay at least 10 feet from all equipment performing subsurface work.

8.6 Site Safety Inspection

The Langan HSO or alternate will conduct daily checks of the work area at the beginning and end of each work shift at a minimum. More frequently checks may be required to ensure safe work conditions. The HSO or alternate must complete the Jobsite Safety Inspection Checklist, found in Appendix F, at least weekly or before completion of work, whichever is shorter. Any deficiencies shall be discussed during the daily tailgate meeting and shared with the PM and HSM, if needed.

8.7 Hand & Power Tools

All hand- and electric-power tools, and similar equipment shall be maintained in a safe operating condition. All electric-power tools must be inspected initially and prior to each use. Damaged tools shall be tagged and removed immediately from service or repaired. Tools shall be used only for the purpose for which they were designed. All users must be properly trained in their safe operation.

8.8 Stop Work Authority

Langan employees have the authority to stop work of other Langan employees and Langan subcontractors when they believe an unsafe condition exists. All project staff are encouraged to exercise "stop work authority" as part of Langan's safety culture.

The following steps shall be taken by Langan employees when performing work with Langan co-workers and Langan subcontractors within a work zone at a site and an unsafe condition is observed.

- When an employee observes an unsafe condition, a Stop Work Intervention shall be immediately initiated with the person(s) potentially at risk.
- The Stop Work Intervention shall be coordinated through the Langan HSO on-site.
- All affected personnel in the work zone shall immediately be notified of the Stop Work Intervention. If necessary, associated work activities should be stopped and persons should be removed from the area.
- All affected personnel shall discuss and gain agreement on the cause of the Stop Work Intervention.
- Every attempt shall be made to resolve the cause of the Stop Work Intervention prior to the resumption of work.
- If the cause of the Stop Work Intervention cannot be resolved immediately, then work shall be suspended until proper resolution is achieved.
- All Stop Work Interventions and associated details shall be documented and reported to the PM and HSM, if needed.

9.0 DECONTAMINATION PLAN

Equipment contamination is anticipated during remedial activities at the site. When equipment is contaminated, all personnel, equipment, and samples leaving the contaminated area of the site must be decontaminated. Decontamination for this operation is achieved through physical removal and chemical detoxification / disinfection / sterilization. The first step in decontamination, however, is prevention and standard operating procedures have been established to minimize contact with wastes:

- Work habits that minimize contact with wastes are stressed.
- Disposable equipment, where appropriate, will be used.

9.1 Decontamination Procedures

Standard decontamination procedures will be used as described in Appendix B.

9.2 Disposal of Decontamination Wastes

Waste solutions generated during decontamination procedures shall be contained, collected, and stored in drums or other appropriate containers and labeled for proper off-site disposal. In the unlikely event that liquids must be transported for disposal, the container will be properly sealed and labeled prior to shipment for proper off-site disposal.

For equipment used during remediation of PCB impacted soils, decontamination of non-porous surfaces on equipment, tools, and machinery will be performed following procedures defined in 40 CFR 761.79(c)(2). Dirty, non-porous surfaces will be decontaminated following the procedures specified in 40 CFR 761.375.

10.0 CONFINED SPACE ENTRY

A confined space has limited or restricted means for entry or exit and is not designed for continuous occupancy. Confined spaces include, but are not limited to, tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork, pipelines, etc. Confined spaces will not be entered by Langan personnel.

11.0 HASP ACKNOWLEDGEMENT FORM

All Langan field personnel and subcontractors will sign this HASP Compliance Agreement indicating that they have become familiar with this HASP, and that they understand it and agree to abide by it.

HASP Compliance Agreement			
Printed Name	**Signature**	**Company**	**Date**

TABLES

TABLE 1
EMERGENCY NOTIFICATION MASTER CONTACT LIST

ORGANIZATION	CONTACT	TELEPHONE
LOCAL EMERGENCY SERVICES		
Local Police Department	Greenwich Police Department	911 or (203) 622-8004
Local Fire Department	Greenwich Fire Department	911 or (203) 622-3950
Ambulance/Rescue Squad	Greenwich Emergency Medical Service Inc.	911 or (203) 637-7505
Hospital	Greenwich Hospital	911 or (203) 863-3637
WORK RELATED INJURIES OR ILLNESS		
WorkCare	Call Service Representative	1-888-449-7787
Langan Incident / Injury Hotline	On-Call Representative	973-560-4699
Langan Project Manager	Ryan Wohlstrom	(203) 784-3069 (office) (203) 464-2731(cell)
Langan Health and Safety Manager (HSM)	Tony Moffa	215-491-6545 (office) 215-756-2523 (cell)
Langan Site Health & Safety Officer (SSO)	John Fitzpatrick	(203) 784-3072 (office) (203) 733-2970 (cell)
Property Owner Representative	Daniel M. Watson Director of School Facilities	(203) 625-7400 (office)
National Response Center (NRC)	Call Service Representative	800-424-8802
Chemical Transportation Emergency Center (Chemtrec)	Call Service Representative	800-424-9300
Center for Disease Control (CDC)	Call Service Representative	404-639-3534
EPA (RCRA Superfund Hotline)	Call Service Representative	800-424-9346
TSCA Hotline	Call Service Representative	202-554-1404
Poison Control Center	Call Service Representative	800-222-1222

TABLE 2
TASK RISK ANALYSES

A. CONTAMINANT HAZARDS OF CONCERN

Task	Contaminant	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
Excavation Oversight	Polychlorinated Biphenyls (42% chlorine)	DustTrak Monitor	PEL 1 mg/m3 IDHL 10 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	Irritation of eyes, chloracne, liver damage, reproductive effects	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.
Excavation Oversight	Polychlorinated Biphenyls (42% chlorine)	DustTrak Monitor	PEL 0.5 mg/m3 IDHL 5 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	Irritation of eyes, chloracne, liver damage, reproductive effects	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.

Task	Contaminant	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
Excavation Oversight	Lead	DustTrak Monitor	PEL 0.05 mg/m3 IDHL 100 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	Lassitude (weakness, exhaustion), insomnia, facial pallor, anorexia, abdominal pain, anemia, tremors, kidney disease, eye irritation, hypertension	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.
Excavation Oversight	Arsenic	DustTrak Monitor	PEL 0.010 mg/m3 IDHL 5 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neurotpathy, respiratory irritation, hyperpigmentation of skin	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.

Task	Contaminant	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
Excavation Oversight	Chlordane	DustTrak Monitor	PEL 0.5 mg/m3 IDHL 100 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	Blurred vision, confusion, cough, abdominal pain, nausea, vomiting, diarrhea, irritability, tremor, convulsions, delirium, ataxia	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.
Excavation Oversight	DDT	DustTrak Monitor	PEL 1 mg/m3 IDHL 500 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	irritation eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise, headache, lassitude, convulsions; paresis hands; vomiting	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.

Task	Contaminant	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
Excavation Oversight	Dieldrin	DustTrak Monitor	PEL 0.25 mg/m3 IDHL 50 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	headache, dizziness; nausea, vomiting, sweating; myoclonic limb jerks; clonic, tonic convulsions; coma	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.
Excavation Oversight	Benzo(a)anthracene	DustTrak Monitor	PEL 0.2 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	dermatitis, bronchitis	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.

Task	Contaminant	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
Excavation Oversight	Benzo(a)pyrene	DustTrak Monitor	PEL 0.2 mg/m3 IDHL 80 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	dermatitis, bronchitis	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.
Excavation Oversight	Chrysene	DustTrak Monitor	PEL 0.2 mg/m3 IDHL 80 mg/m3	Subsurface historic fill material	Inhalation Ingestion Absorption	dermatitis, bronchitis	Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped; transfer promptly to medical facility. Eye Contact: Irrigate eyes immediately. Skin Contact: Wash skin immediately.

EXPLANATION OF ABBREVIATIONS

PID = Photoionization Detector
Inh = Inhalation
Abs = Skin absorbtion
Ing = Ingestion
Con = Skin and/or eye contact
PEL = Permissable Exposure Limit (8-hour Time Weighted Average
IDLH = Immediately Dangerous to Life and Health
LEL = Lower Explosive Limit
ppm = part per million
TLV = Threshold Limit Value
abdom = abdominal
anor = anorexia
arrhy = arrhythmia
card = cardiac
Ca = Considered by NIOSH to be potential occupational carcinogen
[carc] = potential occupational carcinogen
CNS = central nervous system
depres = depressant/depression
derm= dermititis
dizz = dizziness
drow = drowsiness
tg = fatigue
gidd = giddiness
inco = incoordination
inj = injury
lass = lassitude (weakness, exhaustion)
muc memb = mucous membrane
nau = nausea
pares = paresthesia
som = somnolence (sleepiness, unnatural drowsiness)
verti = vertigo
vis dist = visual disturbance

B. PHYSICAL & BIOLOGICAL HAZARDS OF CONCERN

Task	Hazard	Description	Control Measures	First Aid
Excavation Oversight	Dermal Contact	Contact with contaminated soil or groundwater during excavation.	Wear proper PPE; follow safe practices.	Use copious amounts of soap and water. Wash/rinse affected area at least 15 minutes, then provide appropriate medical attention. Eyewash and emergency shower or drench system will be provided onsite outside the exclusion zone as appropriate. Eyes should be rinsed for a minimum of 15 minutes upon chemical contamination.
Excavation Oversight	Inhalation	Inhalation of toxic vapors during excavation.	Move upwind immediately. Follow air monitoring plan; wear PPE.	Move to fresh air and/or, if necessary, decon/transport to emergency medical facility (see Table 2A).
Excavation Oversight	Lifting	Improper lifting/carrying of equipment and materials causing strains.	Follow safe lifting techniques.	Seek medical attention.
Excavation Oversight	Slips, trips, and falls	Any number of injuries could occur from slips, trips, and falls in carrying out these tasks.	Good housekeeping at site, constant awareness and focus on the task.	Treat with general first aid and seek medical attention.

Task	Hazard	Description	Control Measures	First Aid
Excavation Oversight	Noise	Noise produced by equipment.	Wear hearing protection.	Seek medical attention.
Excavation Oversight	Falling objects	Soil material, tools, tree branches.	Hard hats to be worn at all times while in work zones.	Treat with general first aid and seek medical attention.
Excavation Oversight	Underground/ overhead utilities	Excavation tools make contact with underground or overhead object.	Call before you Dig; speak to property owner; geophysical study.	Seek medical attention/first aid if injury Occurs.
Excavation Oversight	Weather	During storms, rain may cause slippery surfaces. Lightning may also accompany storms, creating an electrocution hazard during outdoor operations.	To eliminate this hazard, weather conditions will be monitored and work suspended during electrical storms. Any recorded lightning strike within a 10 mile radius of the work zone, a 30-minute stop work will be initiated. Work will only resume once no lightning strikes are recoded within the 10 mile radius for 30 minutes.	Seek medical attention.
Excavation Oversight	Biting/Stinging Insects and Spiders (Biological)	Insects that may be present onsite include chiggers, bees, wasps, mosquitoes, and ticks.	The HSO will inform personnel about the potential insect hazards and preventative measures, such as the use of insect repellant. Site workers who have a history of allergic reactions to bee stings should inform the HSO during the initial site-specific safety training.	Treat with general first aid and seek medical attention. Victims of venomous spider and snake bites seek immediate medical attention.

TABLE 3
Summary of Monitoring Equipment

Instrument	Operation Parameters
Photoionization Detector (PID)	**Hazard Monitored:** Many organic and some inorganic gases and vapors. **Application:** Detects total concentration of many organic and some inorganic gases and vapors. Some identification of compounds is possible if more than one probe is measured. **Detection Method:** Ionizes molecules using UV radiation; produces a current that is proportional to the number of ions. **General Care/Maintenance:** Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories. **Typical Operating Time:** 10 hours. 5 hours with strip chart recorder.
Oxygen Meter	**Hazard Monitored:** Oxygen (O_2). **Application:** Measures the percentage of O_2 in the air. **Detection Method:** Uses an electrochemical sensor to measure the partial pressure of O_2 in the air, and converts the reading to O_2 concentration. **General Care/Maintenance:** Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to explanation of the specified interval. If the ambient air is less than 0.5% C O_2 , replace the detector cell frequently. **Typical Operating Time:** 8 – 12 hours.
Additional equipment (if needed, based on site conditions)	
Combustible Gas Indicator (CGI)	**Hazard Monitored:** Combustible gases and vapors. **Application:** Measures the concentration of combustible gas or vapor. **Detection Method:** A filament, usually made of platinum, is heated by burning the combustible gas or vapor. The increase in heat is measured. Gases and vapors are ionized in a flame. A current is produced in proportion to the number of carbon atoms present. **General Care/Maintenance:** Recharge or replace battery. Calibrate immediately before use. **Typical Operating Time:** Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.
Flame Ionization Detector (FID) with Gas Chromatography Option *(i.e., Foxboro Organic Vapor Analyzer (OVA))*	**Hazard Monitored:** Many organic gases and vapors (approved areas only). **Application:** In survey mode, detects the concentration of many organic gases and vapors. In gas chromatography (GC) mode, identifies and measures specific compounds. In survey mode, all the organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated. **General Care/Maintenance:** Recharge or replace battery. Monitor fuel and/or combustion air supply gauges. Perform routine maintenance as described in the manual. Check for leaks. **Typical Operating Time:** 8 hours; 3 hours with strip chart recorder.
Potable Infrared (IR) Spectrophotometer	**Hazard Monitored:** Many gases and vapors. **Application:** Measures concentration of many gases and vapors in air. Designed to quantify one or two component mixtures.

Instrument	Operation Parameters
	Detection Method: Passes different frequencies of IR through the sample. The frequencies absorbed are specific for each compound. **General Care/Maintenance:** As specified by the manufacturer.
Direct Reading Colorimetric Indicator Tube	**Hazard Monitored:** Specific gas and vapors. **Application:** Measures concentration of specific gases and vapors. **Detection Method:** The compound reacts with the indicator chemical in the tube, producing a stain whose length or color change is proportional to the compound's concentration. **General Care/Maintenance:** Do not use a previously opened tube even if the indicator chemical is not stained. Check pump for leaks before and after use. Refrigerate before use to maintain a shelf life of about 2 years. Check expiration dates of tubes. Calibrate pump volume at least quarterly. Avoid rough handling which may cause channeling.
Aerosol Monitor	**Hazard Monitored:** Airborne particulate (dust, mist, fume) concentrations **Application:** Measures total concentration of semi-volatile organic compounds, PCBs, and metals. **Detection Method:** Based on light-scattering properties of particulate matter. Using an internal pump, air sample is drawn into the sensing volume where near infrared light scattering is used to detect particles. **General Care/Maintenance:** As specified by the mfr. Also, the instrument must be calibrated with particulates of a size and refractive index similar to those to be measured in the ambient air.
Monitox	**Hazard Monitored:** Gases and vapors. **Application:** Measures specific gases and vapors. **Detection Method:** Electrochemical sensor relatively specific for the chemical species in question. **General Care/Maintenance:** Moisten sponge before use; check the function switch; change the battery when needed.
Gamma Radiation Survey Instrument	**Hazard Monitored:** Gamma Radiation. **Application:** Environmental radiation monitor. **Detection Method:** Scintillation detector. **General Care/Maintenance:** Must be calibrated annually at a specialized facility. **Typical Operating Time:** Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.

TABLE 4

INSTRUMENTATION ACTION LEVELS
Below levels are based using Benzene as the COC and use of a Full Face Respirator.

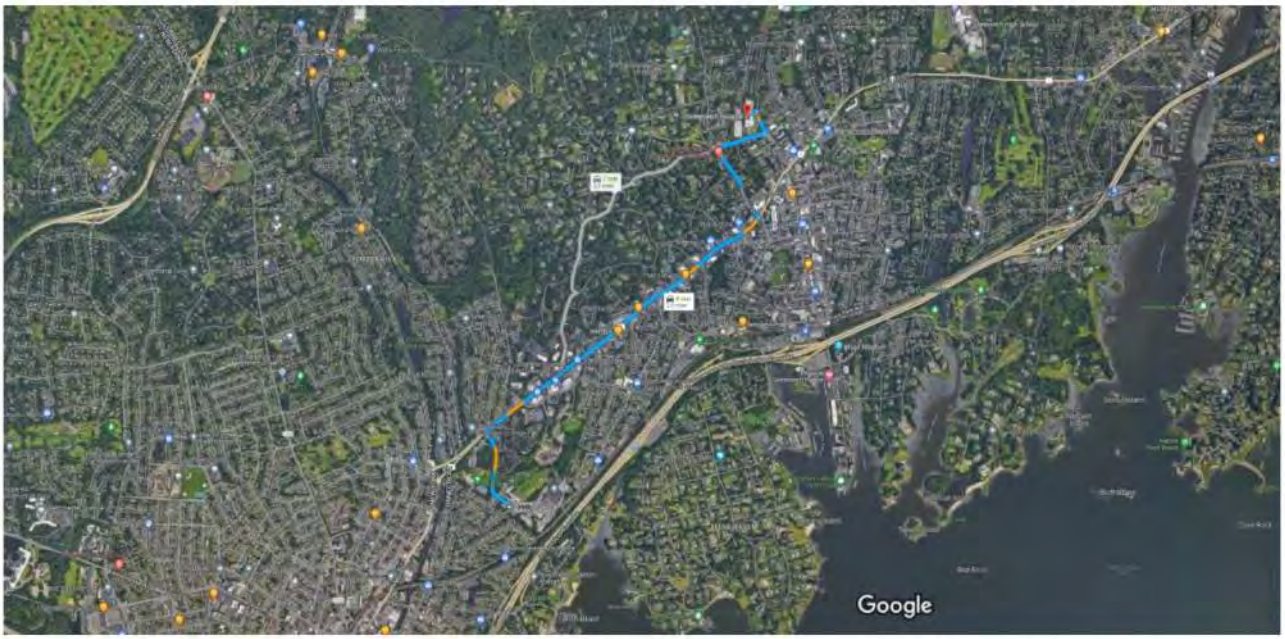
Photoionization Detector Action Levels	**Action Required**
Background to 1 ppm	No respirator; no further action required
> 1 ppm but < 5 ppm for < 5 minutes	1. Temporarily discontinue all activities and evaluate potential causes of the excessive readings. If these levels persist and cannot be mitigated (i.e., by slowing drilling or excavation activities), contact HSO to review conditions and determine source and appropriate response action. 2. If PID readings remain above 1 ppm, temporarily discontinue work and upgrade to Level C protection (Full-Face Respirator Required). 3. If sustained PID readings fall below 1 ppm, downgrading to Level D protection may be permitted.
> 5 ppm but < 50 ppm for > 5 minutes	1. Discontinue all work; all workers shall move to an area upwind of the jobsite. 2. Evaluate potential causes of the excessive readings and allow work area to vent until VOC concentrations fall below 5 ppm. 3. Level C protection (Full-Face Respirator Required) will continue to be used until PID readings fall below 1 ppm.
> 50 ppm	Evacuate the work area

Notes:
1. 1 ppm level based on OSHA Permissible Exposure Limit (PEL) for benzene.
2. 5 ppm level based on OSHA Short Term Exposure Limit (STEL) maximum exposure for benzene for any 15 minute period.
3. 50 ppm level based on the Maximum Use Concertation (MUC) for a full-face respirator or NIOSH Immediately Dangerous to Life and Health (IDLH) for benzene. (The lower value will be used).

FIGURES

FIGURE 1:
EMERGENCY HOSPITAL ROUTE MAP

Google Maps Greenwich Public Schools, Greenwich, CT to Greenwich Hospital, 5 Perryridge Rd, Greenwich, CT 06830 Drive 2.5 miles, 8 min



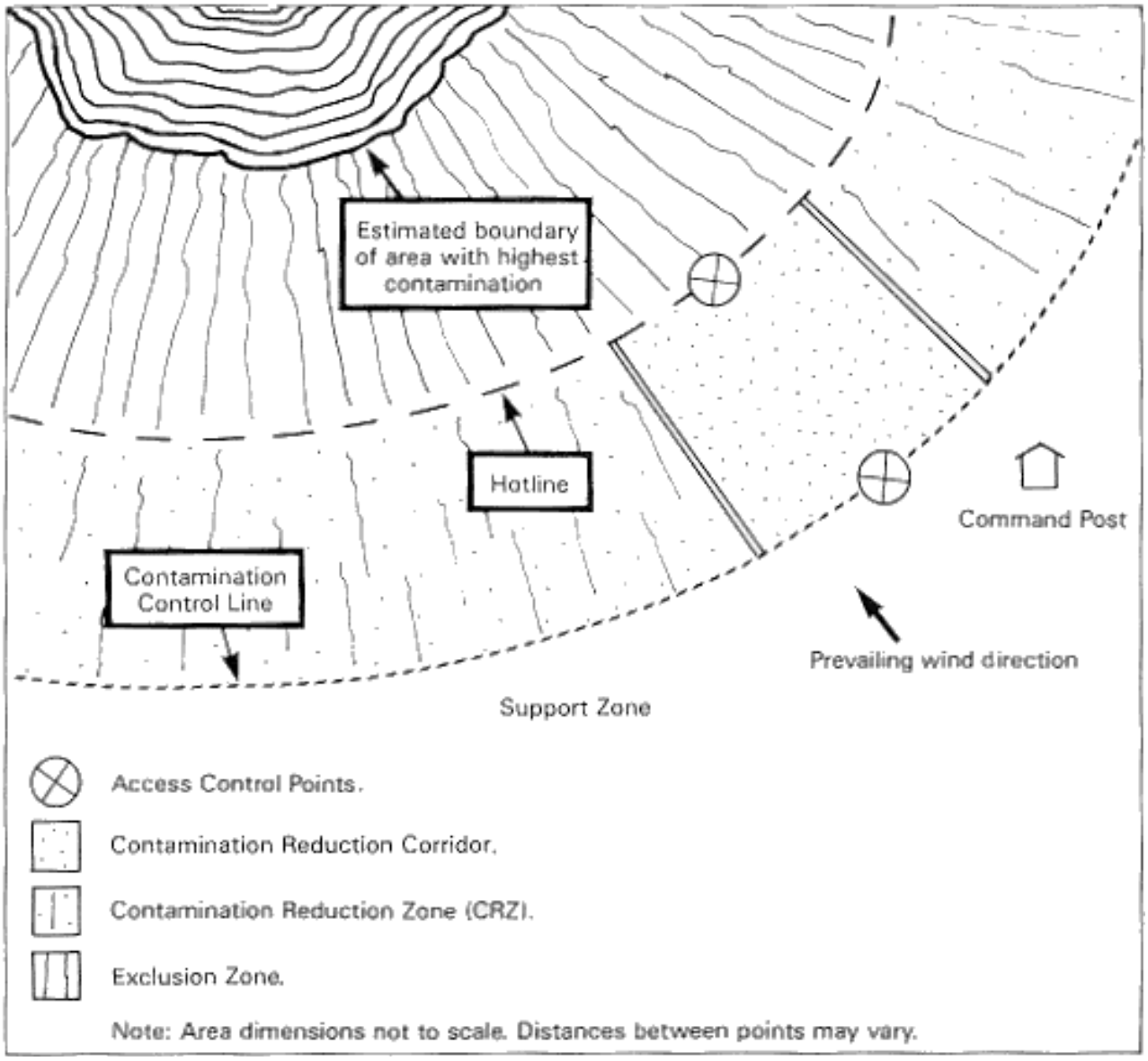
Imagery ©2022 Google, Imagery ©2022 CNES / Airbus, Landsat / Copernicus, Maxar Technologies, New York GIS, USDA/FPAC/GEO, Map data ©2022 1000 ft

Greenwich Public Schools
Greenwich, CT

1. Head north on Richland Rd toward Western Jr Hwy
26 ft
2. Slight left onto Western Jr Hwy
0.4 mi
3. Turn right onto US-1 N
Pass by McDonald's (on the right in 1.1 mi)
1.5 mi
4. Turn left onto Dearfield Dr
0.3 mi
5. At the traffic circle, take the 1st exit onto Lake Ave
0.2 mi
6. At the traffic circle, take the 2nd exit onto Perryridge Rd
0.1 mi
7. Turn left
Destination will be on the right
138 ft

Greenwich Hospital
5 Perryridge Rd, Greenwich, CT 06830

FIGURE 2:
GENERIC MAP OF SITE WORK ZONES



Map Source: NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", October 1985.

Notes:

1. This is not a site-specific map, but a conceptual map depicting a typical layout of work zones at a generic hazardous waste site.
2. See the following text for descriptions of the work zones delineated on the map.

Delineation of Work Zones

Work zones are used to prevent or reduce the migration of contamination. The three recommended contiguous zones are provided below.

- Zone 1: Exclusion Zone
- Zone 2: Contamination Reduction Zone
- Zone 3: Support Zone

Less stringent site control and decontamination procedures may be used if more definitive information is available on the types of substances involved, their locations, and the hazards they present.

Zone 1: Exclusion Zone

The Exclusion Zone is the zone where contamination may exist. An entry and exit checkpoint must be established at the periphery of the Exclusion Zone to regulate the flow of personnel and equipment into and out of the zone.

The outer boundary of this zone, the Hotline, is initially established by visually surveying the area and determining where hazardous substances, drainage, leachate, or spilled material may be located, and whether any discolorations are visible, or from data from the initial site survey.

Additional factors that should be considered include:

- The distances needed to prevent fire or an explosion from affecting personnel outside the zone;
- The physical area necessary to conduct site operations; and,
- The potential for contaminants to be blown from the area.

The Hotline must be physically marked or fenced. The boundary may be modified and adjusted as more information becomes available.

All personnel within the Exclusion Zone must wear the required level of personal protective equipment established in the Health & Safety Plan.

Zone 2: Contamination Reduction Zone

The Contamination Reduction Zone is located between the Exclusion Zone and the Support Zone and provides a transition between contaminated and clean zones. It serves as a buffer to reduce the probability of the clean zone becoming contaminated. Within the Contamination Reduction Zone lies the Contamination Reduction Corridor. This corridor begins at the boundary of the Exclusion Zone and is the area where the decontamination stations are established. Exit from the Exclusion Zone must always be through a decontamination station.

The size and location of the Contamination Reduction Corridor depends on the wind direction (up or side wind), the number of stations in the decontamination procedure, the overall dimension of work control zones, and the amount of space available at the site. An area of 75 by 15 feet should be

adequate for most corridors.

Personnel in the Contamination Reduction Corridor must wear the personal protective equipment designated for the decontamination crew. Another corridor may be required for the entrance and exit of heavy equipment needing decontamination.

Access to the Contamination Reduction Corridor should be limited to personnel wearing the appropriate protection and activities should be limited to decontamination.

Factors to consider when organizing the Contamination Reduction Corridor and selecting decontaminants include:

- The extent and type of hazard expected;
- Explosive potential;
- Meteorological conditions;
- Topography;
- Levels of protection; and
- Availability of equipment and supplies.

Zone 3: Support Zone

The Support Zone is considered to be a non-contaminated or clean area. Support equipment (command post, equipment trailer, etc.) shall be located in the zone and traffic shall be restricted to authorized response personnel. Normal work clothes are appropriate within this zone; potentially contaminated personnel clothing, equipment, and samples must be left in the Contamination Reduction Zone until they are decontaminated.

The location of the command post and other support facilities in the Support Zone depends on the factors below.

1. Accessibility - The topography, available open space, and the locations of highways and railroad tracks.

2. Wind Direction - The support facilities shall be located upwind of the Exclusion Zone. Shifts in wind direction and other conditions may be such that an ideal location determined on the basis of wind direction alone does not exist.

3. Resources - There should be adequate roads, power lines, water, and shelter.

Area Dimensions

The distance, size and shape of each zone must be based on conditions specific to each site. Distances between zone boundaries should be sufficient to allow room for the necessary

operations, provide adequate distances to prevent the spread of contaminants, and eliminate the possibility of injury due to explosion or fire. Long-term operations should involve developing reasonable methods to determine if material is being transferred between zones and to assist in modifying site boundaries.

The following criteria shall be considered in establishing area dimensions and boundary distances:

1. Physical and topographical features of the site;
2. Weather conditions;
3. Field/laboratory measurements of air contaminants and environmental samples;
4. Air dispersion calculations;
5. Potential for explosion and flying debris;
6. Physical, chemical, toxicological, and other characteristics of the substances present;
7. Cleanup activities required;
8. Potential for fire;
9. Area needed to conduct operations;
10. Decontamination procedures;
11. Dimensions of contaminated area; and,
12. Potential for exposure.

APPENDIX A

Standing Orders

LANGAN

STANDING ORDERS

GENERAL

- Utilize Stop Work Authority when warranted.
- No smoking, eating, or drinking in this work zone.
- Upon leaving the work zone, personnel will thoroughly wash their hands and face.
- Minimize contact with contaminated materials through proper planning of work areas and decontamination areas, and by following proper procedures. Do not place equipment on the ground. Do not sit on contaminated materials.
- No open flames in the work zone.
- Only properly trained and equipped personnel are permitted to work in potentially contaminated areas.
- Always use the appropriate level of personal protective equipment (PPE).
- Maintain close contact with your buddy in the work zone
- Contaminated material will be contained in the Exclusion Zone (EZ).
- Report any unusual conditions.
- Work areas will be kept clear and uncluttered. Debris and other slip, trip, and fall hazards will be removed as frequently as possible.
- The number of personnel and equipment in the work zone will be kept to an essential minimum.
- Be alert to the symptoms of fatigue and heat/cold stress, and their effects on the normal caution and judgment of personnel.
- Conflicting situations which may arise concerning safety requirements and working conditions must be addressed and resolved quickly by the site HSO.

TOOLS AND HEAVY EQUIPMENT

- Do not, under any circumstances, enter or ride in or on any backhoe bucket, materials hoist, or any other device not specifically designed to carrying passengers.
- Loose-fitting clothing or loose long hair is prohibited around moving machinery.
- Ensure that heavy equipment operators and all other personnel in the work zone are using the same hand signals to communicate.
- Drilling/excavating within 10 feet in any direction of overhead power lines is prohibited.
- The locations of all underground utilities must be identified and marked out prior to initiating any subsurface activities.
- Check to insure that the equipment operator has lowered all blades and buckets to the ground before shutting off the vehicle.
- If the equipment has an emergency stop device, have the operator show all personnel its location and how to activate it.
- Help the operator ensure adequate clearances when the equipment must negotiate in tight quarters; serve as a signalman to direct backing as necessary.
- Ensure that all heavy equipment that is used in the Exclusion Zone is kept in that zone until the job is done, and that such equipment is completely decontaminated before moving it into the clean area of the work zone.
- Samplers must not reach into or get near rotating equipment such as the drill rig. If personnel must work near any tools that could rotate, the equipment operator must completely shut down the rig prior to initiating such work. It may be necessary to use a remote sampling device.

APPENDIX B

Decontamination Procedures

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PERSONNEL DECONTAMINATION

LEVEL C DECONTAMINATION

Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Canister or Mask Change	4. If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot, Gloves and Outer Garment Removal	5. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	Facepiece Removal	6. Facepiece is removed (avoid touching face with fingers). Facepiece deposited on plastic sheets.
Station 7:	Field Wash	7. Hands and face are thoroughly washed. Shower as soon as possible.

LEVEL D DECONTAMINATION

Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Boot, Gloves and Outer Garment Removal	4. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 5:	Field Wash	5. Hands and face are thoroughly washed. Shower as soon as possible.

EQUIPMENT DECONTAMINATION

GENERAL:

Equipment to be decontaminated during the project may include tools, monitoring equipment, respirators, sampling containers, laboratory equipment and drilling equipment.

All decontamination will be done by personnel in protective gear, appropriate for the level of decontamination, as determined by the site HSO. The decontamination work tasks will be split or rotated among support and work crews.

Depending on site conditions, backhoe and pumps may be decontaminated over a portable decontamination pad to contain wash water; or, wash water may be allowed to run off into a storm sewer system. Equipment needed may include a steam generator with high-pressure water, empty drums, screens, screen support structures, and shovels. Drums will be used to hold contaminated wash water pumped from the lined pit. These drums will be labeled as such.

Miscellaneous tools and equipment will be dropped into a plastic pail, tub, or other container. They will be brushed off and rinsed with a detergent solution, and finally rinsed with clean water.

MONITORING EQUIPMENT:

Monitoring equipment will be protected as much as possible from contamination by draping, masking, or otherwise covering as much of the instruments as possible with plastic without hindering the operation of the unit. The HNu or OVA meter, for example, can be placed in a clear plastic bag, which allows reading of the scale and operation of knobs. The probes can be partially wrapped keeping the sensor tip and discharge port clear.

The contaminated equipment will be taken from the drop area and the protective coverings removed and disposed in the appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe.

RESPIRATORS:

Respirators will be cleaned and disinfected after every use. Taken from the drop area, the masks (with the cartridges removed and disposed of with other used disposable gear) will be immersed in a cleaning solution and scrubbed gently with a soft brush, followed by a rinse in plain warm water, and then allowed to air dry. In the morning, new cartridges will be installed. Personnel will inspect their own masks for serviceability prior to donning them. And, once the mask is on, the wearer will check the respirator for leakage using the negative and positive pressure fit check techniques.

APPENDIX C

Incident Report

LANGAN

INCIDENT/ INJURY REPORT
LANGAN ENGINEERING & ENVIRONMENTAL SERVICES

(Complete and return to Tony Moffa in the Doylestown Office)

Affected Employee Name: _____ Date: _____

Incident type: ☐ Injury ☐ Report Only/No Injury
☐ Near Miss ☐ Other: _____

EMPLOYEE INFORMATION (Person completing Form)

Employee Name: _____ Employee No: _____

Title: _____ Office Location: _____

Length of time employed or date of hire: _____

Mailing address: _____

_____

Sex: M ☐ F ☐ Birth date: _____

Business phone & extension: _____ Residence/cell phone: _____

ACCIDENT INFORMATION

Project: _____ Project #: _____

Date & time of incident: _____ Time work started & ended: _____

Site location: _____

Incident Type: Possible Exposure ☐ Exposure ☐ Physical Injury ☐

Names of person(s) who witnessed the incident: _____

_____

Exact location incident occurred: _____

_____

Describe work being done: _____

_____

Describe what affected employee was doing prior to the incident occurring: _____

Describe in detail how the incident occurred: _____

Nature of the incident (List the parts of the body affected): _____

Person(s) to whom incident was reported (Time and Date): _____

List the names of other persons affected during this incident: _____

Possible causes of the incident (equipment, unsafe work practices, lack of PPE, etc): _____

Weather conditions during incident: _____

MEDICAL CARE INFORMATION

Did affected employee receive medical care? Yes ☐ No ☐

If Yes, when and where was medical care received: _____

Provide name of facility (hospital, clinic, etc): _____

Length of stay at the facility? _____

Did the employee miss any work time? Yes ☐ No ☐ Undetermined ☐

Date employee last worked: _____ Date employee returned to work: _____

Has the employee returned to work? Yes ☐ No ☐

Does the employee have any work limitations or restrictions from the injury? : Yes ☐ No ☐

If Yes, please describe: _____

_____

Did the exposure/injury result in permanent disability? Yes ☐ No ☐ Unknown ☐

If Yes, please describe: _____

HEALTH & SAFETY INFORMATION

Was the operation being conducted under an established site specific Health and Safety Plan?
Yes ☐ No ☐ Not Applicable: ☐

Describe protective equipment and clothing used by the employee:

_____

_____

_____

Did any limitations in safety equipment or protective clothing contribute to or affect exposure / injury? If so, explain:

_____

_____

_____

_____ _____

Employee Signature Date

_____ _____

Langan Representative Date

APPENDIX D

Calibration Log

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DATE:_____ **PROJECT:**_____

CALIBRATION LOG

Date & Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calib Reading	Performed By:

APPENDIX E

Safety Data Sheets

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PCB DISPOSAL

MATERIAL SAFETY DATA SHEET

(POLYCHLORINATED BIPHENYLS)

COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients Name: polychlorinated biphenyls (PCBs)

HAZARD IDENTIFICATION

Reports of Carcinogenicity: YES

HEALTH HAZARDS ACUTE AND CHRONIC

- **Eyes**: Moderately irritating to eye tissues.
- **Skin**: Can be absorbed through intact skin, may cause de-fatting, potential for chloracne.
- **Inhalation**: Possible liver injury.
- **Ingestion**: Slightly toxic; reasonably anticipated to be carcinogenic.

EFFECTS OF OVER-EXPOSURE

Can cause dermatological symptoms; however, these are reversible upon removal of exposure source.

FIRST AID MEASURES

- **Eyes**: Irrigate immediately with copious quantities of running water for at least 15 minutes if liquid or solid PCBs get into them.
- **Skin:** Contaminated clothing should be removed and the skin washed thoroughly with soap and water. Hot PCBs may cause thermal burns.
- **Inhalation**: Remove to fresh air; if skin rash or respiratory irritation persists, consult a physician (if electrical equipment arcs over, PCBs may decompose to produce hydrochloric acid).
- **Ingestion**: Consult a physician. Do not induce vomiting or give any oily laxatives. (If large amounts are ingested, gastric lavage is suggested).

FIRE FIGHTING MEASURES: Flash Point: >141 ^{o}C (285.8 ^{o}F)

EXTINGUISHING MEDIA: PCBs are fire-resistant compounds.

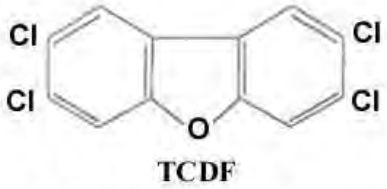
FIRE-FIGHTING PROCEDURES

Standard fire-fighting wearing apparel and self-contained breathing apparatus should be worn when fighting fires that involve possible exposure to chemical combustion products. Fire fighting equipment should be thoroughly cleaned and decontaminated after use.

UNUSUAL FIRE/EXPLOSION HAZARD

If a PCB transformer is involved in a fire-related incident, the owner of the transformer is required to report the incident. Consult and follow appropriate federal, provincial and local regulations.

***Note**: When askarel liquid becomes involved in a fire, toxic by-products of combustion are typically produced including polychlorinated dibenzofurans and polychlorinated dibenzodioxins, both known carcinogens. The structures of these chemical species are as follows:*

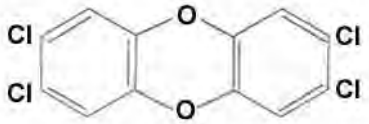


$C_{12}H_{8-n}Cl_nO$

$n = 4 - 8$

TCDF

2,3,7,8-tetrachlorodibenzofuran



$C_{12}H_{8-n}Cl_nO_2$

$n = 4 - 8$

TCDD

2,3,7,8-tetrachloro-dibenzo-p-dioxin

***Note**: 2,3,7,8-tetrachloro-dibenzo-p-dioxin is one of the most potent teratogenic, mutagenic and carcinogenic agents known to man.*

SPILL RELEASE PROCEDURES

Cleanup & disposal of liquid PCBs are strictly regulated by the federal government. Ventilate area. Contain spill/leak. Remove spill by means of absorptive material. Spill clean-up personnel should use proper protective clothing. All wastes and residues containing PCBs should be collected, containerized, marked and disposed of in the manner prescribed by applicable federal, provincial and local laws.

HANDLING AND STORAGE PRECAUTIONS

Care should be taken to prevent entry into the environment through spills, leakage, use, vaporization, or disposal of liquid. Avoid prolonged breathing of vapours or mists. Avoid contact with eyes or prolonged contact with skin. Comply with all federal, provincial and local regulations.

OTHER PRECAUTIONS

Federal regulations require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be appropriately labelled.

RESPIRATORY PROTECTION

Use OHSA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical splash goggles. The respirator use limitations specified by the manufacturer must be observed.

VENTILATION

Provide natural or mechanical ventilation to control exposure levels below airborne exposure levels.

PROTECTIVE GLOVES: Wear appropriate chemical resistant gloves to prevent skin contact.

EYE PROTECTION: Wear chemical splash goggles and have eye baths available.

OTHER PROTECTIVE EQUIPMENT

Wear appropriate protective clothing. Provide a safety shower at any location where skin contact can occur.

WORK HYGIENIC PRACTICES

Wash thoroughly after handling. Supplemental safety and health : none

PHYSICAL/CHEMICAL PROPERTIES

- **Vapour pressure:** (mm Hg @100 ^{o}F) 0.005 - 0.00006
- **Viscosity:** (CENTISTOKES) 3.6 - 540
- **Stability indicator/materials to avoid:** Yes
- **Stability Condition to Avoid:** PCBs are very stable, fire-resistant compounds.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide, hydrogen chloride, phenolics, aldehydes, furans, dioxins

WASTE DISPOSAL METHODS

Consult the applicable PCB regulations prior to any disposal of PCBs or PCB-contaminated items.

Date of Issue:
30 January 2017

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2586
SRM Name: Trace Elements in Soil Containing Lead from Paint (Nominal Mass Fraction 500 mg/kg Lead)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use in the evaluation of methods and for the calibration of apparatus used to determine lead and other trace elements in soil. SRM 2586 is a blended mixture of soil samples collected from urban areas where the principal source of lead is believed to be from old house lead-based paint. A unit consists of approximately 55 g of material with a particle size of <75 μm (200 mesh).

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Not classified.

Label Elements
Symbol
No Symbol/Pictogram

Signal Word
Not applicable.

Hazard Statement(s): Not applicable.

Precautionary Statement(s): Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Urban soil

Other Designations: Soil.

This material is naturally occurring urban soil. The material contains trace amounts of metals and should be handled with care. Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Urban soil	Not available	Not available	100

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If adverse effects occur after ingestion, seek medical treatment.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. Fire Fighting Measures

Fire and Explosion Hazards: Negligible fire hazard. Avoid generating dust. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate for surrounding fire.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 0 Reactivity = 0

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers. Keep unnecessary people away, isolate hazard area and deny entry.

7. Handling and Storage

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handling in accordance with all current regulations and standards. .

8. Exposure Controls and Personal Protection

Exposure Limits: No occupational exposure limits have been established for soil. This material is a particulate matter and adequate inhalation/respiratory protection should be used to minimize exposure. The exposure limits for Particulates Not Otherwise Regulated (PNOR) are applicable.

OSHA (PEL): 15 mg/m^3 (TWA, total particulates not otherwise regulated)
OSHA (PEL) 5 mg/m^3 (TWA, respirable particulates not otherwise regulated)

NIOSH (REL): 10 mg/m^3 (TWA, total particulates not otherwise regulated, 8 h)
NIOSH (REL): 5 mg/m^3 (TWA, respirable particulates not otherwise regulated)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:

Appearance (physical state, color, etc.):	amorphous powder
Molecular Formula:	not applicable
Molar Mass (g/mol):	not applicable
Odor:	not available
Odor threshold:	not available
pH:	not available
Evaporation rate:	not applicable
Melting point/freezing point (ºC):	not available
Specific Gravity (water=1)	not available
Vapor Pressure (mmHg):	not applicable
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	not available
Partition coefficient (n-octanol/water):	not available
Particle Size:	<75 μm

Thermal Stability Properties:

Autoignition Temperature (ºC):	not available
Thermal Decomposition (ºC):	not available
Initial boiling point and boiling range (ºC):	not available
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (ºC):	not available
Flammability (solid, gas):	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: None listed.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Generated dust may cause irritation, if inhaled.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Generated dust may cause irritation.

Skin Contact: May cause mechanical irritation.

Eye Contact: May cause mechanical irritation.

Ingestion: No data available.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified, no data available.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/ Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ Yes X No
Agricultural soil is not listed by NTP, IARC or OSHA as a carcinogen.

Reproductive Toxicity: Not classified; no data available.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified; no data available.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	No.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:

California Proposition 65: Not listed.

U.S. TSCA Inventory: Not listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 30 January 2017

Sources: 29 CFR Occupational Health and Safety Office (OSHA) 1910.1000, *Limits for Air Contaminants*, Table Z-1; available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992 (accessed Jan 2017).

Center for Disease Control (CDC) NIOSH Pocket Guide to Chemical Hazards, *Particulates not otherwise regulated*; available at http://www.cdc.gov/niosh/npg/npgd0480.html (accessed Jan 2017).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.

Date of Issue:
03 June 2014

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2587
SRM Name: Trace Elements in Soil Containing Lead from Paint (Nominal 3000 mg/kg Lead)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use in the evaluation of methods and for the calibration of apparatus used to determine lead and other trace elements in soil. SRM 2587 is composed of soil samples collected from a suburban garden known to have been contaminated by lead based house paint. A unit of SRM 2587 consists of approximately 55 g of material with a particle size of <75 µm (200 mesh).

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

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FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Carcinogenicity – Category 1B
Reproductive Toxicity – Category 1A
Specific Target Organ Toxicity, Repeated Exposure – Category 2

Label Elements

Symbol:

Signal Word: DANGER

Hazard Statement(s):

H350	May cause cancer.
H360	May damage fertility or the unborn child.
H373	May causes damage to organs (nervous system, kidneys, liver, blood) through prolonged or repeated exposure.

Precautionary Statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270 + P271	Do not eat, drink or smoke when using this product. Use only in a well-ventilated area.
P281	Use personal protective equipment as required.

P308 + 313 If exposed or concerned: Get medical attention.

P405 Store locked up.

P501 Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Contaminated soil

Other Designations: Not applicable.

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the NIST Certificate of Analysis. Lead carbonate is the main source of lead from paint contained in this material. The hazard information in this Safety Data Sheet is for basic lead carbonate.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Contaminated Soil	Not available	Not available	100
Individual Constituent(s)			
Basic lead carbonate	1319-46-6	215-290-6	0.3

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. If necessary, seek medical attention.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If a large amount is swallowed, seek medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Cancer, birth defects, reproductive effects.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate for the surrounding area.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: Avoid generating dust. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handling in accordance with all current regulations and standards.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

OSHA (PEL): 15 mg/m^3 (TWA, total particulates PNOR)
5 mg/m^3 (TWA, respirable particulates PNOR)

NIOSH (REL): 0.050 mg/m^3 TWA (as Pb, related Lead compounds)

NIOSH (REL): 100.0 mg/m^3 IDLH (as Pb, related Lead compounds)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:	**Soil**	**Basic Lead Carbonate 0.3 %**
Appearance (physical state, color, etc.):	powder	not applicable
Molecular Formula:	not applicable	$(PbCO_3)_2 \cdot Pb(OH)_2$
Molar Mass (g/mol):	not applicable	775.70
Odor:	not available	odorless
Odor threshold:	not available	not available
pH:	not available	not available
Evaporation rate:	not available	not applicable
Melting point/freezing point (ºC):	not available	not available
Relative Density (g/L):	not available	6.75 to 6.85 (relative to water)
Vapor Pressure (mmHg):	not available	not applicable
Vapor Density (air = 1):	not available	not applicable
Viscosity (cP):	not available	not applicable
Solubility(ies):	not available	insoluble in water and alcohol soluble in dilute acids
Partition coefficient (n-octanol/water):	not available	not available
Particle Size (if relevant)	≤ 75 μm	not available

Thermal Stability Properties:

Autoignition Temperature (°C):	not applicable	not available
Thermal Decomposition (°C):	not applicable	not available
Initial boiling point and boiling range (°C):	not applicable	decomposes
Explosive Limits, LEL (Volume %):	not applicable	not available
Explosive Limits, UEL (Volume %):	not applicable	not available
Flash Point (°C)	not applicable	not available
Flammability (solid, gas):	not applicable	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: No data available.

Conditions to Avoid: Generating dust.

Incompatible Materials: No data available.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of lead and carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Fatigue, weakness, anorexia, anemia, jaundice, encephalopathy.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Acute health effects resulting from exposure to the lead carbonate in this material are unlikely. Chronic exposure to lead compounds may result in accumulation in body tissues resulting in adverse effects on the blood, nervous system, heart, kidneys, endocrine and reproductive systems. Lead has been shown to cause cancer and birth defects.

Skin Contact: No toxicity data available; dust may result in mechanical irritation.

Eye Contact: No toxicity data available; dust may cause mechanical irritation.

Ingestion: Ingestion of this material is unlikely under normal conditions of use. Lead is a cumulative toxin and repeated exposures can cause high levels to build up. Over exposure to lead, or lead compounds either through acute or chronic exposure, can result in severe damage to the nervous system, urinary system, and reproductive system. Lead has been shown to cause cancer and birth defects.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified; no data available.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/ Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 1B

Listed as a Carcinogen/Potential Carcinogen X Yes _____ No

NTP lists lead compounds as "reasonably anticipated to be human carcinogens".
IARC lists inorganic lead compounds in Group 2A (probably carcinogenic to humans). Lead is not listed by OSHA.

Reproductive Toxicity: Category 1A; lead crosses the placenta and may affect the fetus causing birth defects, mental retardation, behavioral disorders, and death during the first year of childhood.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Category 2; lead can accumulate in body tissues.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:

California Proposition 65:

WARNING! This product contains a chemical (lead) known to the state of California to cause cancer.

WARNING! This product contains a chemical (lead) known to the state of California to cause reproductive/developmental effects.

U.S. TSCA Inventory: Basic lead carbonate is listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 03 June 2014

Sources: ChemAdvisor, Inc., MSDS *Basic Lead Carbonate*, 21 March 2014.

CDC; NIOSH; *NIOSH Pocket Guide to Chemical Hazards*; Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Institute for Safety and Health; *Particulates Not Otherwise Regulated*, 4 April 2011; available at http://www.cdc.gov/niosh/npg/npgd0480.html (accessed June 2014).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.

Date of Issue:
19 February 2019

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 3103a
SRM Name: Arsenic (As) Standard Solution
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use as a primary calibration standard for the quantitative determination of arsenic. A unit of SRM 3103a consists of five 10 mL sealed borosilicate glass ampoules of an acidified aqueous solution prepared gravimetrically to contain a known mass fraction of arsenic. The solution contains nitric acid at a volume fraction of approximately 10 %, which is equivalent to a concentration (molarity) of approximately 1.6 mol/L.

Company Information

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E-mail: SRMMSDS@nist.gov
Website: https://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard:	Not classified.	
Health Hazard:	Skin Corrosion/Irritation	Category 1B
	Serious Eye Damage/Irritation	Category 1
	Carcinogenicity	Category 1A

Label Elements

Symbol

Signal Word
DANGER

Hazard Statement(s)

H314	Causes severe skin burns and eye damage.
H350	May cause cancer through inhalation.

Precautionary Statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe fumes, mists, vapors, spray.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, eye protection.
P301 + P330 + P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	If on skin (or hair): Remove immediately all contaminated clothing. Rinse skin with water.
P304 + P340	If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a doctor.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Nitric Acid/Arsenic Acid Solution

Other Designations:

Nitric acid (aqua fortis; hydrogen nitrate; azotic acid; engraver's acid)
Arsenic acid (Arsenate; Orthoarsenic acid; H_3AsO_4)

NOTE: Arsenic in nitric acid solution forms solvated arsenic acid. The health and physical hazard information provided in this SDS are for nitric and arsenic acid. No physical or chemical data are listed for this solution. The actual effects of the solution may differ from the individual components.

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Nitric acid	7697-37-2	231-714-2	10
Arsenic Acid	7778-39-4	231-901-9	1.9
Non-Hazardous Component(s)			
Water	7732-18-5	231-791-2	>88

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

Eye Contact: Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

Ingestion: Contact a poison control center immediately for instructions. Do not induce vomiting. Give water to rinse out mouth. Never give liquids to a person with reduced awareness or becoming unconscious. If vomiting occurs, keep head lower than hips to prevent aspiration. If not breathing, give artificial respiration by qualified personnel. Seek immediate medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Acid burns to skin, eyes, and lungs.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate to the surrounding fire.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Thermal decomposition will form oxides of nitrogen and arsine.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 3 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Do not touch spilled material. Notify safety personnel of spills. Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection". Handle glass ampoules with care.

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (See Section 10, "Stability and Reactivity").

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Component: Nitric acid

NIOSH (REL):	5 mg/m^3 (2 ppm; TWA)
	10 mg/m^3 (4 ppm; STEL)
	65 mg/m^3(25 ppm; IDLH)
ACGIH (TLV):	5 mg/m^3 (2 ppm; TWA)
	10 mg/m^3 (4 ppm; STEL)
OSHA (PEL):	5 mg/m^3 (2 ppm; TWA)

Component: Arsenic acid (as As, related to Arsenic, inorganic compounds)

NIOSH (REL):	0.002 mg/m^3 (15 min, Ceiling)
	5 mg/m^3 (15 min, Ceiling)
ACGIH (TLV):	0.01 mg/m^3 (TWA)
OSHA (PEL):	10 $\mu g/m^3$ (cancer hazard, see 29 CFR 1910.1018, except Arsine as As, TWA)
	5 $\mu g/m^3$ (Action Level)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

NOTE: The physical and chemical data provided are for the pure components. No physical or chemical data are available for this solution. The actual behavior of the solution may differ from the individual components.

Descriptive Properties:	**Nitric acid (10 % of this SRM)**	**Arsenic Acid (1.9 % of this SRM)**
Appearance (physical state, color, etc.):	colorless to yellow liquid	colorless or white solid
Molecular Formula:	HNO_3	H_3AsO_4
Molar Mass (g/mol):	63.01	141.95
Odor:	irritating odor	odorless
Odor threshold:	not available	not available
pH:	1 (1 M)	not available
Evaporation rate:	not available	not available
Melting point/freezing point (ºC):	–42 (–43 ºF)	96 (205 ºF)

Descriptive Properties:	Nitric acid (10 % of this SRM)	Arsenic Acid (1.9 % of this SRM)
Relative Density (g/L) as specific gravity (water = 1):	1.5027 at 25 ºC	2.2
Vapor Pressure (mmHg):	47.9 at 20 ºC	not available
Vapor Density (air = 1):	3.2	not available
Viscosity (cP):	not available	not available
Solubility(ies):	miscible with water and ether	soluble in water, alcohol and glycerol
Partition coefficient (n-octanol/water):	not available	not available
Thermal Stability Properties:		
Autoignition Temperature (ºC):	not applicable	not applicable
Thermal Decomposition (ºC):	not applicable	not available
Initial boiling point and boiling range (ºC):	83 (181 ºF)	not available
Explosive Limits, LEL (Volume %):	not applicable	not available
Explosive Limits, UEL (Volume %):	not applicable	not available
Flash Point (ºC):	not applicable	not available
Flammability (solid, gas):	not applicable	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Contact with combustible or incompatible materials.

Incompatible Materials: Incompatible with acids, combustible materials, halo carbons, amines, bases, oxidizing materials, metals, halogens, metal salts, metal oxides, reducing agents, peroxides, metal carbide, and cyanides.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of nitrogen and arsenic.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Burning pain and severe skin corrosion, eye, lung, and blood damage, and cancer.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Inhalation of nitric acid can damage the mucous membranes and upper respiratory tract. Short term exposure may cause irritation and inflammation of the upper respiratory tract, coughing, choking, sore throat, shortness of breath, headache, dizziness, and nausea. Long term exposure to acid fumes may cause damage to teeth, bronchial irritation, chronic cough, bronchial pneumonia, and gastrointestinal disturbances. Arsenic inorganic compounds may cause foamy sputum.

Skin Contact: Nitric acid can cause severe skin burns. Severity of the damage depends on the concentration and duration of exposure. Effects of acid burns may be delayed. Short term contact with arsenic inorganic compounds can cause irritation and may cause sensitization.

Eye Contact: Nitric acid and arsenic inorganic compounds can cause severe eye irritation, corneal burns, permanent eye damage, or blindness. Severity of the damage depends on the concentration and duration of exposure.

Ingestion: Ingestion of this material is unlikely under normal conditions of use. If ingested, nitric acid can cause severe burns and damage to the gastrointestinal tract. Acute ingestion of low levels of arsenic inorganic compounds can cause tearing, diarrhea, bluish skin color, kidney damage, liver damage, and death. Chronic ingestion may have the same effects and may also cause cancer.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.

Nitric acid, Rat, Inhalation LC50: 130 mg/m^3 (4 h)

Arsenic acid, Rat, Oral LD50: 48 mg/kg

Skin Corrosion/Irritation: This SRM contains >1 % of nitric acid and it is classified as Category 1B.

Serious Eye Damage/Irritation: This SRM contains >1 % nitric acid and it is classified as Category 1.

Respiratory Sensitization: No data available; not classified.

Skin Sensitization: No data available; not classified.

Germ Cell Mutagenicity: No data available; not classified.

Carcinogenicity: Category 1A.

Listed as a Carcinogen/Potential Carcinogen X Yes ____ No

Nitric acid is not listed by NTP, IARC or OSHA as a carcinogen.

NTP lists Arsenic (inorganic compounds) as known human carcinogen. IARC Monograph 84 (2004) lists arsenic in Group 1 (carcinogenic to humans). OSHA lists inorganic arsenic as a designated carcinogen.

Reproductive Toxicity: Not classified.

Nitric acid, Rat, Oral TDLo: 21 150 mg/kg (pregnant 1 d to 21 d)
Nitric acid, Rat, Oral TDLo: 2345 mg/kg (pregnant 18 d)
Arsenic acid: Rat, Oral TDLo: 120 mg/kg (pregnant 7 to 15 d)

Specific Target Organ Toxicity, Single Exposure: No data available; not classified.

Specific Target Organ Toxicity, Repeated Exposure: No data available; not classified.

Aspiration Hazard: No data available; not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Nitric acid: Starfish (*Asterias rubens*) LC50: 100 mg/L – 300 mg/L (renewal/aerated water, 48 h)
Arsenic acid: Fathead minnow (*Pimephales promelas*) LC50: 25.6 mg/L (96 h)
Bluegill (*Lepomis macrochirus*) LC50: 39 mg/L – 110 mg/L (static, 96 h)
Bluegill (*Lepomis macrochirus*) LC50: 43 mg/L – 59 mg/L (flow-through, 96 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.
Nitric acid and arsenic acid subject to disposal regulations: U.S. EPA 40 CFR 262.

Nitric acid Hazardous Waste Numbers: D001, D002.

Arsenic acid Hazardous Waste Numbers: P010, D004. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level (5.0 mg/L).

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1760, Corrosive liquid, n.o.s. (contains nitric acid), Hazard Class 8, Packing Group II, Excepted Quantities E2.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Nitric acid, 1000 lbs (454 kg) RQ;
Arsenic acid, 1 lb (0.454 kg) RQ
SARA Title III Section 302 (40 CFR 355.30): Nitric acid, 1000 lbs (454 kg) TPQ
SARA Title III Section 304 (40 CFR 355.40): Nitric acid, 1000 lbs (454 kg) EPCRA RQ
SARA Title III Section 313 (40 CFR 372.65): Nitric acid, 1 % de minimis concentration;
Arsenic acid, 0.1 % de minimis concentration (related to Arsenic inorganic compounds)
OSHA Process Safety (29 CFR 1910.119): Nitric acid, higher concentrations 500 lbs TQ (≥94.5 % by weight)

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:

California Proposition 65: WARNING! This product contains a chemical known (arsenic inorganic compounds) to the state of California to cause cancer.

U.S. TSCA Inventory: Nitric acid and arsenic acid are listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 19 February 2019

Sources: ChemAdvisor, Inc., SDS *Nitric Acid*, 22 September 2015.

ChemAdvisor, Inc., SDS *Arsenic Acid*, 09 December 2015.

CDC; NIOSH; *NIOSH Pocket Guide to Chemical Hazards*; Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Institute for Safety and Health; *Nitric Acid*, 13 February 2015; available at https://www.cdc.gov/niosh/npg/npgd0447.html (accessed Feb 2019).

Hazardous Substances Data Bank (HSDB), National Library of Medicine's TOXNET system, *Nitric Acid CAS No. 7697-37-2*; available at https://toxnet.nlm.nih.gov (accessed Feb 2019).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50%	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System
n.o.s.	Not Otherwise Specified		

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at https://www.nist.gov/srm.

TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Toxic compound, do not ingest or inhale. Avoid all contact with this material.** **CARCINOGEN. MINIMIZE EXPOSURE.**	

Section I. Chemical Product and Company Identification

Chemical Name **Benz[a]anthracene**

Catalog Number	B0017
Synonym	Tetraphene
Chemical Formula	$C_{18}H_{12}$
CAS Number	56-55-3

Supplier
TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call
Chemtrec®
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Benz[a]anthracene	56-55-3	Min. 99.0 (GC)	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LD_{50} (intravenous) >200 mg/kg

Section III. Hazards Identification

Acute Health Effects

Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Possible carcinogen.
(sufficient evidence in animals, no adaquate data in humans)
Tumorigenic: Mouse (dermal) 18mg/kg. Neoplastic by RTECS criteria.
Tumorigenic: Mouse (implant) 80 mg/kg. Carcinogenic by RTECS criteria.
Tumorigenic: Mouse (subcutaneous) 2 mg/kg. Equivocal tumorigenic by RTECS criteria.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Not available.
DEVELOPMENTAL TOXICITY Not available.
The substance is toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section IV. First Aid Measures

Eye Contact

Check for and remove any contact lenses. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention. Treat symptomatically and supportively.

Skin Contact

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.

Inhalation

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

Ingestion

INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt, or waistband. If the victim is not breathing, administer artificial respiration. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

Continued on Next Page

Section V. Fire and Explosion Data

Flammability	Combustible.	Auto-Ignition	Not available.
Flash Points	Not available.	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO_2).		
Fire Hazards	No specific information is available regarding the flammability of this compound in the presence of various materials.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No additional information is available regarding the risks of explosion.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO_2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Toxic solid. Harmful solid. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information	TOXIC. POSSIBLE CARCINOGEN. Handle with caution and minimize exposure. Keep away from heat and sources of ignition. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Avoid contact with skin and eyes. Always store away from incompatible compounds such as oxidizing agents.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Light yellow to tan powder.	Solubility	Soluble in diethyl ether, acetone. Very slightly soluble in methanol, n-octanol. Insoluble in cold water, hot water.
Specific Gravity	Not available.		
Molecular Weight	228.29	Partition Coefficient	0
Boiling Point	437.6°C (819.7°F)	Vapor Pressure	Not available.
Melting Point	157 to 159°C (314.6 to 318.2°F)	Vapor Density	Not available.
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Not available.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with oxidizing agents.

Continued on Next Page

Section XI. Toxicological Information

RTECS Number	CV9275000
Routes of Exposure	Ingestion. Inhalation. Eye contact. Skin contact.
Toxicity Data	Rat LD_{50} (intravenous) >200 mg/kg
Chronic Toxic Effects	**CARCINOGENIC EFFECTS** : Possible carcinogen. (sufficient evidence in animals, no adaquate data in humans) Tumorigenic: Mouse (dermal) 18mg/kg. Neoplastic by RTECS criteria. Tumorigenic: Mouse (implant) 80 mg/kg. Carcinogenic by RTECS criteria. Tumorigenic: Mouse (subcutaneous) 2 mg/kg. Equivocal tumorigenic by RTECS criteria. **MUTAGENIC EFFECTS** : Not available. **TERATOGENIC EFFECTS** : Not available. **DEVELOPMENTAL TOXICITY**: Not available. The substance is toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Acute Toxic Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	The pattern of benz(a)anthracene (BA) release into air and water is quite general since it is a universal product of combustion of organic matter. Both in air and water it is largely associated with particulate matter. When released into water it will rapidly become adsorbed to sediment or particulate matter in the water column, and bioconcentrate into aquatic organisms. In the unadsorbed state, it will degrade by photolysis in a matter of hours to days. Its slow desorption from sediment and particulate matter will maintain a low concentration of BA in the water. Because it is strongly adsorbed to soil it will remain in the upper few centimeters of soil and not leach into groundwater. BA will very slowly biodegrade when colonies of microorganisms are acclimated but this is too slow a process (half-life ca 1 yr to be significant). Benz(a)anthracene in the atmosphere will be transported long distances and will probably be subject to photolysis and photooxidation although there is little documentation about the rate of these processes in the literature. Humans will be exposed to benz(a)anthracene in ambient air, particularly in industrial areas, from stoves, cigarette smoke, food (particularly when smoked or charcoal broiled), and drinking water.(HSDB)

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of this substance.

Section XIV. Transport Information

DOT Classification	DOT CLASS 6.1: Poisonous material.
PIN Number	UN2811
Proper Shipping Name	Toxic solids, organic, n.o.s.
Packing Group (PG)	II
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).
EINECS Number (EEC)	200-280-6
EEC Risk Statements	R45- May cause cancer.
Japanese Regulatory Data	Not available.

Continued on Next Page

Section XVI. Other Information

Version 1.0
Validated on 11/3/1997.
Printed 1/20/2005.

Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

SAFETY DATA SHEET

Revision Date 14-Feb-2020 **Revision Number** 2

1. Identification

Product Name **Benzo[a]pyrene**

Cat No. : **15856**

CAS-No 50-32-8
Synonyms Benzo[def]chrysene.; 3,4-Benzopyrene; 3,4-Benzpyrene

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Emergency Telephone Number
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660.
After normal business hours, call Carechem 24 at (866) 928-0789.

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Sensitization	Category 1
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Reproductive Toxicity	Category 1B

Label Elements

Signal Word
Danger

Hazard Statements
May cause an allergic skin reaction
May cause genetic defects
May cause cancer
May damage fertility. May damage the unborn child

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Avoid breathing dust/fume/gas/mist/vapors/spray
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves
Response
IF exposed or concerned: Get medical attention/advice
Skin
IF ON SKIN: Wash with plenty of soap and water
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse
Storage
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects
WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Benzo[a]pyrene	50-32-8	> 96

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

Most important symptoms and effects None reasonably foreseeable. . May cause allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature Not applicable
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	1	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment and Clean Up Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Avoid dust formation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Benzo[a]pyrene		TWA: 0.2 mg/m³		

Legend

OSHA - Occupational Safety and Health Administration

Engineering Measures Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard

EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder Solid
Appearance	Dark yellow
Odor	aromatic
Odor Threshold	No information available
pH	Not applicable
Melting Point/Range	175 - 179 °C / 347 - 354.2 °F
Boiling Point/Range	495 °C / 923 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	Not applicable
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	Not applicable
Specific Gravity	No information available
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	Not applicable
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	C20H12
Molecular Weight	252.31

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products.

Incompatible Materials Oxidizing agent

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization May cause sensitization by skin contact

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Benzo[a]pyrene	50-32-8	Group 1	Reasonably Anticipated	A2	X	A2

IARC (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans
NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Benzo[a]pyrene	Group III Chemical	Not applicable	Not applicable

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Persistence and Degradability May persist

Bioaccumulation/ Accumulation No information available.

Mobility Is not likely mobile in the environment due its low water solubility.

Component	log Pow
Benzo[a]pyrene	6.06

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Benzo[a]pyrene - 50-32-8	U022	-

14. Transport information

DOT

UN-No	UN3077
Proper Shipping Name	Environmentally hazardous substances, solid, n.o.s.
Technical Name	Benzo[a]pyrene
Hazard Class	9
Packing Group	III

TDG

UN-No	UN3077
Proper Shipping Name	Environmentally hazardous substances, solid, n.o.s.
Hazard Class	9
Packing Group	III

IATA

UN-No	UN3077
Proper Shipping Name	Environmentally hazardous substances, solid, n.o.s.
Hazard Class	9
Packing Group	III

IMDG/IMO

UN-No	UN3077
Proper Shipping Name	Environmentally hazardous substances, solid, n.o.s.
Hazard Class	9
Packing Group	III

15. Regulatory information

United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
Benzo[a]pyrene	50-32-8	X	ACTIVE	-

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL
Benzo[a]pyrene	50-32-8	X	-	200-028-5	X	-	-	X	KE-05-0184

U.S. Federal Regulations

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Benzo[a]pyrene	50-32-8	> 96	0.1

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Benzo[a]pyrene	-	-	X	X

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA Not applicable

Component	Hazardous Substances RQs	CERCLA EHS RQs
Benzo[a]pyrene	1 lb	-

California Proposition 65 This product contains the following Proposition 65 chemicals.

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Benzo[a]pyrene	50-32-8	Carcinogen	0.06 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Benzo[a]pyrene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Health, Safety and Environmental Department
Email: tech@alfa.com
www.alfa.com

Revision Date 14-Feb-2020
Print Date 14-Feb-2020
Revision Summary SDS authoring systems update, replaces ChemGes SDS No. 50-32-8/1.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET

1. Identification

Product identifier **Benzo(b)fluoranthene**

Other means of identification

Item N-11165

Recommended use For Laboratory Use Only

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Chem Service, Inc.

Address 660 Tower Lane
West Chester, PA 19380
United States

Telephone Toll Free 800-452-9994
Direct 610-692-3026

Website www.chemservice.com

E-mail info@chemservice.com

Emergency phone number Chemtrec US 800-424-9300
Chemtrec outside US +1 703-527-3887

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Carcinogenicity Category 1

Environmental hazards Hazardous to the aquatic environment, acute hazard Category 1

Hazardous to the aquatic environment, long-term hazard Category 1

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May cause cancer. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response If exposed or concerned: Get medical advice/attention. Collect spillage.

Storage Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information Not applicable.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Benzo(b)fluoranthene		205-99-2	100

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways. Stop the flow of material, if this is without risk. Collect spillage. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Avoid release to the environment. Do not empty into drains.
Conditions for safe storage, including any incompatibilities	Store locked up. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Use personal protective equipment as required.

Skin protection	
Hand protection	Use personal protective equipment as required.
Other	Use personal protective equipment as required.
Respiratory protection	Use personal protective equipment as required.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Solid.
Form	Solid. Crystalline Solid
Color	Pale yellow
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	334.4 °F (168 °C)
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	0.0000001 kPa at 25 °C
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	6.6
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Molecular formula	C20-H12
Molecular weight	252.32 g/mol

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	No adverse effects due to inhalation are expected.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity	Not available.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization	
Respiratory sensitization	Not available.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Benzo(b)fluoranthene (CAS 205-99-2)	2B Possibly carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens

Benzo(b)fluoranthene (CAS 205-99-2)	Reasonably Anticipated to be a Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not available.
Chronic effects	Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity	Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.
Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	Not available.

Partition coefficient n-octanol / water (log Kow)

6.6

Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN3077
UN proper shipping name	Environmentally hazardous substances, solid, n.o.s. (Benzo(b)fluoranthene RQ = 1 LBS)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Label(s)	9
Packing group	III
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33
Packaging exceptions	155
Packaging non bulk	213
Packaging bulk	240

IATA

UN number	UN3077
UN proper shipping name	Environmentally hazardous substance, solid, n.o.s. (Benzo(b)fluoranthene)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	No.
ERG Code	9L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed.
Cargo aircraft only	Allowed.

IMDG

UN number	UN3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo(b)fluoranthene)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-F
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

DOT; IATA; IMDG

General information	DOT Regulated Marine Pollutant. IMDG Regulated Marine Pollutant.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
One or more components are not listed on TSCA.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Benzo(b)fluoranthene (CAS 205-99-2) Listed.

SARA 304 Emergency release notification

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - No
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Benzo(b)fluoranthene	205-99-2	100

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Benzo(b)fluoranthene (CAS 205-99-2)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)

Priority pollutant
Toxic pollutant

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US - New Jersey RTK - Substances: Listed substance

Benzo(b)fluoranthene (CAS 205-99-2)

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Benzo(b)fluoranthene (CAS 205-99-2)

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Benzo(b)fluoranthene (CAS 205-99-2)

US. Massachusetts RTK - Substance List

Benzo(b)fluoranthene (CAS 205-99-2)

US. New Jersey Worker and Community Right-to-Know Act

Benzo(b)fluoranthene (CAS 205-99-2)

US. Pennsylvania RTK - Hazardous Substances

Benzo(b)fluoranthene (CAS 205-99-2)

US. Pennsylvania Worker and Community Right-to-Know Law

Benzo(b)fluoranthene (CAS 205-99-2)

US. Rhode Island RTK

Benzo(b)fluoranthene (CAS 205-99-2)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Benzo(b)fluoranthene (CAS 205-99-2) Listed: July 1, 1987

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 04-29-2015

Version # 01

NFPA ratings Health: 0
Flammability: 0
Instability: 0

Disclaimer The above information is believed to be correct on the date it was last revised and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded SDS must be made available to the employee within three months. RESPONSIBILITY for updates lies with the employer and not with CHEM SERVICE, Inc.

Persons not specifically and properly trained should not handle this chemical or its container. This product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticide products, food additives or as household chemicals.

This Safety Data Sheet (SDS) is intended only for use with Chem Service, Inc. products and should not be relied on for use with materials from any other supplier even if the chemical name(s) on the product are identical! Whenever using an SDS for a solution or mixture the user should refer to the SDS for every component of the solution or mixture. Chem Service warrants that this SDS is based upon the most current information available to Chem Service at the time it was last revised. THIS WARRANTY IS EXCLUSIVE, AND CHEM SERVICE, INC. MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. This SDS is provided gratis and CHEM SERVICE, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR CONTINGENT DAMAGES.

This product is furnished FOR LABORATORY USE ONLY.

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 3 Reviewed on 01/29/2019

*
1 Identification

· **Product identifier**

· **Trade name: Benzo(k)fluoranthene**

· **Part number:** RAH-073
· **CAS Number:**
207-08-9
· **EC number:**
205-916-6
· **Index number:**
601-036-00-5
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS08 Health hazard

Carc. 1B H350 May cause cancer.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
benzo[k]fluoranthene
· **Hazard statements**
May cause cancer.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/protective clothing/eye protection/face protection.
IF exposed or concerned: Get medical advice/attention.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

(Contd. on page 2)

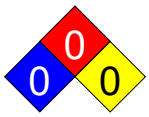
Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 3 Reviewed on 01/29/2019

Trade name: Benzo(k)fluoranthene

(Contd. of page 1)

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 0
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = *0
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
207-08-9 benzo[k]fluoranthene
· **Identification number(s)**
· **EC number:** 205-916-6
· **Index number:** 601-036-00-5

4 First-aid measures

· **Description of first aid measures**
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Generally the product does not irritate the skin.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
Substance is not listed.

· **PAC-2:**
Substance is not listed.

· **PAC-3:**
Substance is not listed.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.
At this time, the other constituents have no known exposure limits.
· **Additional information:** The lists that were valid during the creation were used as basis.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**

Tightly sealed goggles

*
9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Crystalline
Color:	Yellow
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Product is not flammable.

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Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not applicable.
· **Density:**	Not determined.
· **Relative density**	Not determined.
· **Vapor density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Insoluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
2B

· **NTP (National Toxicology Program)**
R

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

*
14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN3077
· **UN proper shipping name**	
· **DOT**	Environmentally hazardous substance, solid, n.o.s. (benzo[k] fluoranthene)
· **IMDG**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (benzo[k]fluoranthene), MARINE POLLUTANT

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Benzo(k)fluoranthene

(Contd. of page 6)

· **IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (benzo[k]fluoranthene)
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	
· **Class**	9 Miscellaneous dangerous substances and articles
· **Label**	9
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	Yes (DOT) Symbol (fish and tree)
· **Special marking (IATA):**	Symbol (fish and tree)
· **Special precautions for user**	Warning: Miscellaneous dangerous substances and articles
· **Danger code (Kemler):**	90
· **EMS Number:**	F-A,S-F
· **Stowage Category**	A
· **Stowage Code**	SW23 When transported in BK3 bulk container, see 7.6.2.12 and 7.7.3.9.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: No limit On cargo aircraft only: No limit
· **Hazardous substance:**	5000 lbs, 2270 kg
· **Remarks:**	Special marking with the symbol (fish and tree).
· **IMDG**	
· **Limited quantities (LQ)**	5 kg
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 g Maximum net quantity per outer packaging: 1000 g
· **UN "Model Regulation":**	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (BENZO[K]FLUORANTHENE), 9, III

*
15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

(Contd. on page 8)

(Contd. of page 7)

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is not listed.

· **TSCA new (21st Century Act): (Substances not listed)**

207-08-9	benzo[k]fluoranthene

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
B2

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **National regulations:**
· **Additional classification according to Decree on Hazardous Materials:**
Carcinogenic hazardous material group I (extremely dangerous).
Carcinogenic hazardous material group II (very dangerous).
Carcinogenic hazardous material group III (dangerous).

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 2
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association

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Trade name: Benzo(k)fluoranthene

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ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Carc. 1B: Carcinogenicity – Category 1B

· *** Data compared to the previous version altered.**

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 2 Reviewed on 03/24/2019

*

1 Identification

· **Product identifier**

· **Trade name: Chrysene**

· **Part number:** RAH-007
· **CAS Number:**
218-01-9
· **EC number:**
205-923-4
· **Index number:**
601-048-00-0
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Muta. 2 H341 Suspected of causing genetic defects.
Carc. 1B H350 May cause cancer.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
chrysene
· **Hazard statements**
Suspected of causing genetic defects.
May cause cancer.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/protective clothing/eye protection/face protection.
IF exposed or concerned: Get medical advice/attention.
Store locked up.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

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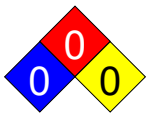
Trade name: Chrysene

(Contd. of page 1)

Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 0
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = *0
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
218-01-9 chrysene
· **Identification number(s)**
· **EC number:** 205-923-4
· **Index number:** 601-048-00-0

4 First-aid measures

· **Description of first aid measures**
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Generally the product does not irritate the skin.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

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6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
0.6 mg/m³
· **PAC-2:**
12 mg/m³
· **PAC-3:**
69 mg/m³

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
218-01-9 chrysene	
PEL	Long-term value: 0.2 mg/m³ see Coal Tar Pitch Volatiles
REL	Long-term value: 0.1* mg/m³ *Cyclohexane-extrble.fraction;PocketGuide Apps.A+C
TLV	L, BEIp

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Safety Data Sheet
acc. to OSHA HCS

Trade name: Chrysene

(Contd. of page 3)

· **Ingredients with biological limit values:**

218-01-9 chrysene

BEI -
Medium: urine
Time: end of shift at end of workweek
Parameter: 1-Hydroxypyrene with hydrolysis (nonquantitative)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**

Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**
Form: Solid
Color: Not determined.
· **Odor:** Characteristic
· **Odor threshold:** Not determined.

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Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	256 °C (492.8 °F)
Boiling point/Boiling range:	448 °C (838.4 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Product is not flammable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not applicable.
· **Density at 20 °C (68 °F):**	1.274 g/cm³ (10.63153 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Insoluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

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Safety Data Sheet
acc. to OSHA HCS

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11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
2B

· **NTP (National Toxicology Program)**
R

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Self-assessment): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

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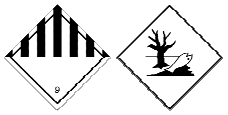
14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN3077
· **UN proper shipping name**	
· **DOT**	Environmentally hazardous substance, solid, n.o.s. (chrysene)
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (chrysene)
· **Transport hazard class(es)**	
· **DOT, IMDG**	
· **Class**	9 Miscellaneous dangerous substances and articles
· **Label**	9
· **IATA**	
· **Class**	9 Miscellaneous dangerous substances and articles
· **Label**	9
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	
· **Special marking (IATA):**	Symbol (fish and tree)
· **Special precautions for user**	Warning: Miscellaneous dangerous substances and articles
· **Danger code (Kemler):**	90
· **EMS Number:**	F-A,S-F
· **Stowage Category**	A
· **Stowage Code**	SW23 When transported in BK3 bulk container, see 7.6.2.12 and 7.7.3.9.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: No limit On cargo aircraft only: No limit
· **Hazardous substance:**	100 lbs, 45.4 kg
· **IMDG**	
· **Limited quantities (LQ)**	5 kg

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Safety Data Sheet
acc. to OSHA HCS

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· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 g Maximum net quantity per outer packaging: 1000 g
· **UN "Model Regulation":**	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (CHRYSENE), 9, III

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **TSCA new (21st Century Act): (Substances not listed)**

218-01-9	chrysene

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

B2

· **TLV (Threshold Limit Value established by ACGIH)**

A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is listed.

· **National regulations:**
· **Additional classification according to Decree on Hazardous Materials:**
Carcinogenic hazardous material group I (extremely dangerous).
Carcinogenic hazardous material group II (very dangerous).
Carcinogenic hazardous material group III (dangerous).

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Chrysene

(Contd. of page 8)

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Muta. 2: Germ cell mutagenicity – Category 2
Carc. 1B: Carcinogenicity – Category 1B
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME	:	Chlordane
NAME OF MANUFACTURER	:	GL Sciences Inc.
ADDRESS	:	22-1 Nishishinjuku 6-chome Shinjuku-ku Tokyo 163-1130, Japan
CHARGE SECTION	:	International Sales Section
TELEPHONE No.	:	+81-3-5323-6620
FACSIMILE No.	:	+81-3-5323-6621
PRODUCT No.	:	1021-34060
SDS No.	:	1021-34060

Research use only.

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION :

Acute toxicity - oral	: Category 4
Acute toxicity – dermal	: Category 3
Skin corrosion/irritation	: Category 2
Serious eye damage/eye irritation	: Category 2
Germ cell mutagenicity	: Category 2
Carcinogenicity	: Category 2
Reproductive toxicity-effects on or via lactation	: Category 2
Reproductive toxicity-effects on or via lactation	: effects on or via lactation
Specific target organ toxicity (single exposure)	: Category 1 <nervous system>
Specific target organ toxicity (repeated exposure)	: Category 1 <nervous system, liver, blood>
Hazardous to the aquatic environment –acute hazard	: Category 1
Hazardous to the aquatic environment –chronic hazard	: Category 1

HAZARDS SYMBOL :

SIGNAL WORD : Danger

HAZARD STATEMENT :

H302	Harmful if swallowed
H311	Toxic in contact with skin
H315	Causes skin irritation
H319	Causes serious eye irritation
H341	Suspected of causing genetic defects
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H362	May cause harm to breast-fed children
H370	Causes damage to organs<nervous system>
H372	Causes damage to organs throug h prolonged or repeated exposure < nervous system, liver, blood>
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS :

P202	Do not handle until all safety precautions have been read and understood.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.

P280	Wear protective gloves/eye protection.
P260	Do not breathing gas/mist/vapours.
P263	Avoid contact during pregnancy and while nursing.
P273	Avoid release to the environment.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P330	Rinse mouth.
P302+P352	IF ON SKIN: Wash with plenty of water.
P312	Call a POISON CENTER or doctor if you feel unwell.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
P332+P313	IF skin irritation occurs: Get medical advice/attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	IF eye irritation persists: Get medical advice/attention.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P314	Get medical attention if you feel unwell.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/container in accordance with all applicable regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL IDENTITY	:	Chlordane
SYNONYMS	:	1,2,4,5,6,7,8,8-Octachlor-2,3,3a,4,7,7a-hexahydro-4,7-metha-1H-indene
CHEMICAL FOMULA	:	$C_{10}H_6Cl_8$
CONTENT	:	> 98 %
CAS No.	:	57-74-9
TSCA INVENTRY	:	Listed
EINECS No.	:	200-349-0
EC INDEX No.	:	602-047-00-8

4. FIRST AID MEASURES

GENERAL ADVICE	:	Wash off immediately with soap and plenty of water. In the case of respirable dust and/or fumes, use self-contained breathing apparatus and dust impervious protective suit. Use personal protective equipment.
INHALATION	:	Move victim to fresh air. If breathing is difficult, give oxygen. If irritation persists, consult a physician.
SKIN CONTACT	:	Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. If irritation persists, consult a physician.
EYE CONTACT	:	Remove any contact lenses at once. Flush eyes well with flooding large amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. If irritation persists, consult a physician.
INGESTION	:	Rinse mouth. Never give anything by mouth to an unconscious person. Consult a physician immediately.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA	:	Carbon dioxide, dry chemical powder, foam, water spray
FIRE & EXPLOSION HAZARDS	:	Toxic, irritating dust, fumes or smoke may be emitted.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS		
	:	Fireman should wear normal protective equipment(full bunker gear) and positive-pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS	:	Remove ignition sources and ventilate the area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid raising dust and avoid contact with skin and eyes.
ENVIROMENTAL PRECATIONS	:	Prevent spills from entering sewers, watercourses or low areas.
METHODS FOR CLEAN UP	:	Do not touch spilled material without suitable protection. After material is completely picked up, wash the spill site with soap and water and ventilate the area. Pull all wastes in a plastic bag for disposal and seal it tightly. Remove, clean, or dispose contaminated clothing.

7. HANDLING AND STORAGE

HANDLING	:	Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Handle material with suitable protection. After this product, dispose of contents/container in accordance with all applicable regulations and appropriate ways.
STORAGE	:	Store away from sunlight in well-ventilated place at 2 – 10℃. Keep container tightly closed.
INCOMOPATIBLE PRODUCTS	:	Bases

8. EXPOSURE CONTROL/PERSONAL PROTECTION

ENGINEERING MEASURES	:	Use exhaust ventilation to keep airborne concentrations below exposure limits. Use only with adequate ventilation.
VENTILATION	:	Local Exhaust ; Necessary, Mechanical(General) ; Recommended
PERSONAL PROTECTION		
RESPIRATORY PROTECTION	:	Use respirators approved under appropriate government standards and follow all regulations.
HAND PROTECTION	:	Chemical resistant gloves
EYE PROTECTION	:	Safety glasses(goggles)
SKIN PROTECTION	:	Protective clothing
CONTROL PARAMETERS		
OSHA	:	0.5mg/m3(skin)
NIOSH REL	:	0.5mg/m3(skin)
ACGIH	:	0.5mg/m3(skin)

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	:	White
SHAPE	:	Solid
ODOR	:	Irritating odor
pH	:	No data available
BOILING POINT	:	175℃(1mmHg)
MELTING POINT	:	106℃
FLASH POINT	:	56℃(CC)
FLAMMABILITY	:	lower:0.7% upper:5%
AUTOIGNITION TEMPERATURE	:	No data available
VAPOR PRESSURE	:	No data available
VAPOR DENCITY	:	14(Air=1)
DENCITY	:	1.60g/cm3(25℃)
SOLUBILITY IN		
WATER	:	slightly insoluble
Organic solvent	:	very soluble
DECOMPOSITION TEMPERATURE		
	:	No data available

10. STABILITY AND REACTIVITY

REACTIVITY	:	Stable under recommended storage conditions.
CHEMICAL STABILITY	:	Very toxic and corrosive gases are emitted by heating. Reacts with oxidizers, acids, bases.
CONDITION TO AVOID	:	Heat, contact with incompatible materials.
INCOMPATIBILE MATERIALS	:	Bases
HAZARDOUS DECOMPOSITION PRODUCTS		
	:	CO, CO_2, Hydrogen chloride, Chlorine, Phosgene

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (oral)	:	Rat LD50= 83 ～ 590 mg/kg (ATSDR(1994),EHC 34(1984),IARC vol.79 (2001),JMPR 180(1970),ACGIH(2001))
ACUTE TOXICITY (dermal)	:	Rat LD50= 205～590-840mg/kg Rabbit LD50= 205～1100-1200 mg/kg (EHC 34(1984), ACGIH(2001))
SKIN CORROSION/IRRITATION	:	Human: contact with skin may cause skin irritation.(ASTDR(1994), EHC 34(1984))
EYE DAMAGE/EYE IRRITATION	:	Human: Industry worker, eye, skin, mucosa irritation.(ATSDR(1994), EHC 34(1984))

GERM CELL MUTAGENICITY	:	Mouse: Positive (EHC 34(1984),IARC 79(2001),ATSDR(1994))
CARCINOGENICITY	:	Classified at, IARC: 2B(2001), ACGIH: A3(1996)
REPRODUCTIVE TOXICITY	:	Rat: increasing the loss rate of baby, neurobehavioral consequences.(EHC 34(1984),ATSDR (1994)),IRIS(2002))
SPECIFIC TARGET ORGAN TOXICITY-single exposure		
	:	Human: appear nervous symptoms after inhalation.(IARC79(2001), EHC 34 (1984),PIMs(2000))
SPECIFIC TARGET ORGAN TOXICITY-repeated exposure		
	:	Rat, mouse, human: appear nervous symptoms, liver damage, hematological damage. (IARC 79(2001),EHC 34(1984)),IRIS(1997))
ASPIRATION TOXICITY	:	No data available

12. ECOLOGICAL INFORMATION

ECOTOXICITY	:	Crustacea (shrimp pink): LC50=0.4μg/L/96hr (EHC 34,1984)
BIODEGRADABILITY	:	BOD: 0%, BCF=13,900-27,900(3μg/L), 13,000-26,100(0.3μg/L)
BIOACCUMULATION POTENTIAL	:	log Pow=6.16
MOBILITY IN SOIL	:	No data available
OTHER ADVERSE EFFECTS	:	Not listed in Montreal Protocol list.

13. DISPOSAL INFORMATION

Dispose in a hazardous-waste site in accordance with all applicable regulations. Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environment agency for specific rules).

14. TRANSPORT INFORMATION

IATA

UN NUMBER	:	UN 2761
UN PROPER SHIPPING NAME	:	Organochlorine pesticides, solid, toxic. (Chlordane)
CLASS or DIVISION	:	Toxic (Class 6.1)
PACKING GROUP	:	Ⅲ

DOT

IDENTIFICATION NUMBER	:	UN 2761
PROPER SHIPPING NAME	:	Organochlorine pesticides, solid, toxic. (Chlordane)
HAZARD CLASS	:	Toxic (Class 6.1)
MARINE POLLUTANT	:	Yes

15. REGULATORY INFORMATION

US REGULATIONS	:	Labeling according to US regulations; See section 2
EU REGURATIONS	:	Labeling according to EC Directives; See section 2

16. OTHER INFORMATION

NOTICE:

The information contained in the SDS description is applicable exclusively to the chemical substance identified herein and for its intended use as an analytical reference standard or reagent and to the unit quantity intended for that purpose. The information does not relate to, and may not be appropriate for, any application or larger quantity of the substance described. Our products are intended for the use by individuals possessing sufficient technical skill and qualification on use the material potential hazardous chemical. Accordingly, no representation or warranty, express or implied, with respect to merchantability and fitness for a particular purpose is made with respect to the information contained herein.

Attention:

This product in terms of chemical identity and the unit amount provide is intended for use in chemical analysis and not for human consumption, nor any other purpose.

Date of Issue:
28 May 2015

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

RM Number: 8469
RM Name: 4,4'-DDT
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Reference Material (RM) is intended for use in the evaluation of procedures and working standards in used in the measurement of dichlorodiphenyltrichloroethane (4,4'-DDT) in environmental samples. RM 8469 is provided as a primary reference compound of measured purity for 4,4'-DDT. A unit of RM 8469 consists of one vial containing approximately 100 mg of 4,4'-DDT.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.

Health Hazard:		
	Acute Toxicity, Oral, Dermal	Category 3
	Carcinogenicity	Category 2
	STOT, Repeated exposure	Category 1

Label Elements

Symbol

Signal Word

DANGER

Hazard Statement(s):

H301+H311	Toxic if swallowed or in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs <central nervous system> through prolonged or repeated exposure <ingestion>.

Precautionary Statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, and eye protection.
P301+P310	If on skin: Wash with plenty of water.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.

P301+P310	If swallowed: Immediately call a doctor.
P330	Rinse mouth.
P312	Call a doctor.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: 4,4'-DDT

Other Designations: DDT; *p,p*'-DDT; 1,1'-(2,2,2-trichlroroethylidene)bis(4-chlorobenzene); dicophane; 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane; alpha,alpha-bis(p-chlorophenyl)-beta,beta,beta-trichloroethane; pentachlorin; RCRA U061; $C_{14}H_9Cl_5$.

Components listed below are in compliance with OSHA's 29 CFR 1910.1200.

Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
4,4'-DDT	50-29-3	200-024-3	99.8

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eye Contact: Flush eyes with water for at least 15 minutes. Then get immediate medical attention.

Ingestion: If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

Most Important Symptoms/Effects, Acute and Delayed: Organochlorine pesticides cause liver and kidney damage.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Slight fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:
Suitable: Regular dry chemical, water, and regular foam.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2 Fire = 1 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Do not touch spilled material. Notify safety personnel of spills. Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry. Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

7. HANDLING AND STORAGE

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (See Section 10, "Stability and Reactivity").

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

ACGIH (TLV): 1 mg/m^3 (TWA)

NIOSH (REL): 0.5 mg/m^3 (TWA)
500 mg/m^3 (IDLH)

OSHA (PEL): 1 mg/m^3 (TWA)
Prevent or reduce skin absorption.

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:	**4,4'-DDT**
Appearance (physical state, color, etc.):	white crystalline solid
Molecular Formula:	$C_{14}H_9Cl_5$
Molar Mass (g/mol):	354.49
Odor:	not available
Odor threshold:	not available
pH:	not available
Evaporation rate:	not applicable
Melting point/freezing point:	107 °C to 109 °C (224.6 °F to 228.2 °F)
Specific Gravity (water=1):	1.56 at 15 °C
Vapor Pressure (mmHg):	not available
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	insoluble in water (0.12 ppm at 25 °C), soluble in acetone, ether, pyridines, kerosene, benzene, carbon tetrachloride, dioxane, chloroform, and organic solvents
Partition coefficient (n-octanol/water):	not available
Particle Size:	not available

Thermal Stability Properties:	**4,4' DDT**
Autoignition Temperature (ºC):	not available
Thermal Decomposition (ºC):	not available
Initial boiling point and boiling range (ºC):	260 °C (500 °F)
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (ºC):	not available
Flammability (solid, gas):	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers.

Incompatible Materials: Bases, combustible materials, metal salts, metals, and oxidizing materials.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce chlorides and oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Nausea, vomiting, diarrhea, stomach pain, and headache.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Same as ingestion if sufficient amounts are absorbed through the lungs.

Skin Contact: Same as ingestion if sufficient amounts are absorbed through the skin.

Eye Contact: May cause eye irritation.

Ingestion: Oral ingestion of food is the primary source of exposure for the general population. Acute and chronic ingestion was cause nausea, vomiting, diarrhea, stomach pain, headache, dizziness, disorientation, tingling sensation, kidney damage, liver damage, convulsions, coma, and death. 4,4'-DDT may cross the placenta and can be excreted in breast milk.

Numerical Measures of Toxicity:

Acute Toxicity: Category 3, Oral, Dermal
Rat, Oral LD50: 87 mg/kg
Rabbit, Dermal LD50: 300 mg/kg

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye Damage/Irritation: Not classified.
Human, Eye: 423 mg/m^3 for 1 h day for 6 d (irritation)

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 2

Listed as a Carcinogen/Potential Carcinogen X Yes _____ No
4,4'-DDT is listed by IARC as Group 2B (possibly carcinogenic to humans) and by NTP as *Reasonably Anticipated To Be A Human Carcinogen*. It is not listed by OSHA as a carcinogen/potential carcinogen.

Tumorigenic effects: Rat, Oral TD: 438 mg/kg (2 years)
Mutagenic effects: Human, 200 µg/L (72 h)

Reproductive Toxicity: Not classified; no data available.
Rat, Oral, TDLo: 430 mg/kg (pregnant 1 d to 21 d, 21 d).

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Category 1, prolonged or repeated exposure may damage the central nervous system.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Fish Toxicity: Rainbow trout (*Oncorhynchus mykiss*) LC50 [static]: 1.25 µg/L to 3.59 µg/L (96 h)
Invertebrate: Water flea (*Daphnia magna*) LC50 [static]: 0.000 46 mg/L to 0.001 mg/L (48 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: BCF 1.17 species: fish.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U061.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN2761, Organochlorine pesticide, solid, n.o.s. (4,4'-DDT); Hazard class 6.1, PG III, Excepted Quantity: E1.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): 1 lb (0.454 kg) final RQ.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:
California Proposition 65: WARNING! This product contains a chemical (4,4'-DDT) known to the state of California to cause cancer and reproductive/developmental effects.

U.S. TSCA Inventory: Listed.

TSCA 12(b), Export Notification: Section 5, 0.1 % de minimus concentration.

Canadian Regulations:
WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 28 May 2015

Sources: ChemADVISOR, Inc., SDS *Dichlorodiphenyltrichloroethane*, 20 March 2015.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The reference values for this material are given in the NIST Report of Investigation.

Users of this RM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.

Material Safety Data Sheet

HAZARDOUS

Catalog Number: **157672**

Revision date: 08-Mar-2005

Australia Hazardous Statement: **Hazardous according to criteria of NOHSC**

1. COMPANY DETAILS

Supplier:	MP Biomedicals Australasia Pty Limited Unit 12, 167 Prospect Hwy. Seven Hills, NSW 2147 Aust.
Telephone Number:	(02) 9838 7422
Fax Number:	(02) 9838 7390
Emergency telephone number:	(02) 9838 7422: hours: 8.30 AM to 5.00 PM
Australian Business Number (ABN):	31 106 467 109

2. IDENTIFICATION

Product name:	DIELDRIN
Catalog Number:	157672
Synonyms:	Alvit, Dieldrex
UN/Id No:	2761
Proper shipping name:	Organochlorine, pesticide, solid, toxic
IATA Hazard Label(s):	Toxic
Hazard Class	6.1
-	Toxic substances - dermal
Subsidiary risk:	No Subsidiary Risk allocated
Packing group:	II
Emergency Action Code (Hazchem code):	2X
Poisons schedule No. (Aust)/Toxic Substance (NZ):	S7 Dangerous Poison.
Recommended use:	Research product for non-human use

Component	**Australia (AICS):**
DIELDRIN 60-57-1 (100)	Present

3. PHYSICAL DESCRIPTION/PROPERTIES

Appearance and Odor	White crystalline solid or light brown dry flakes; odorless or mild chemical odor.
Physical state:	Solid
Formula:	C12H8Cl6O
Molecular weight:	380.93
Boiling point/range:	Decomposes upon boiling.
Melting point/range:	177 °C
Density:	1.75 (water = 1)
Vapor pressure:	Less than 8 x 10-7 mm Hg at 20 °C 7.78 x 10-7 mm Hg at 25 °C

Vapor density:	13.2 (air = 1)
Solubility (in water):	Practically not soluble
Flash point:	Not determined
Autoignition temperature:	Not determined
Flammable limits in air - lower (%):	Not determined
Flammable limits in air - upper (%):	Not determined

4. INGREDIENTS

Components	CAS Number	Weight %	EC No.	Classification
DIELDRIN	60-57-1	100	200-484-5	T+; N

5. HAZARDS IDENTIFICATION

Australia Hazardous Statement: Hazardous according to criteria of NOHSC

Indication of Danger:
T+ - Very toxic.
N - Dangerous For The Environment.

Risk Phrases:
R27 - Very toxic in contact with skin.
R40 - Limited evidence of a carcinogenic effect.
R53 - May cause long-term adverse effects in the aquatic environment.
R50 - Very toxic to aquatic organisms.
R48/25 - Toxic: danger of serious damage to health by prolonged exposure if swallowed.
R25 - Toxic if swallowed.

Safety Phrases:
S61 - Avoid release to the environment. Refer to special instructions/Safety data sheets.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
S60 - This material and its container must be disposed of as hazardous waste.
S22 - Do not breathe dust.

S36/37 - Wear suitable protective clothing and gloves.

Category of Danger: Very Toxic , Dangerous for the environment , Carc. cat. 3

Poisons schedule No. (Aust)/Toxic Substance (NZ): S7 Dangerous Poison.

6. HEALTH HAZARD INFORMATION

HEALTH EFFECTS

EMERGENCY OVERVIEW:	Harmful to flora, fauna, soil organisms and aquatic organisms. Very toxic: danger of very serious irreversible effects in contact with skin. May also have serious irreversible effects through inhalation or ingestion.
Principle routes of exposure:	Skin

Inhalation: Harmful: possible risk of irreversible effects through inhalation.
Ingestion: Harmful: danger of serious damage to health if ingested.
Skin contact: Very Toxic: danger of serious damage to health by prolonged skin contact.
Eye contact: Risk of serious damage to eyes
Statements of hazard Very toxic in contact with skin

Components	Australian Exposure Standards - Carcinogens	Australia - Exposure Standards - Short
DIELDRIN	Not Listed	Not Listed

Components	Australia - Exposure Standards - Skin E	Australia - Exposure Standards - Time W
DIELDRIN	skin absorption	0.25 mg/m³ TWA

FIRST AID

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Inhalation: Move to fresh air. Call a physician immediately.
Skin contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician Remove and wash contaminated clothing before re-use
Ingestion: Call a physician immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Drink 1 or 2 glasses of water. Induce vomiting if person is conscious.
Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Protection of first-aiders: No information available
Notes to physician: None
Medical conditions aggravated by exposure: None known

7. PRECAUTIONS FOR USE

Section 8 Notes: TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life. According to current knowledge this concentration should neither impair the health or, not cause undue discomfort to, nearly all workers.

Engineering measures: Ensure adequate ventilation, especially in confined areas.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection: Self-contained breathing apparatus
Hand protection: Pvc disposable gloves
Skin and body protection: Impervious clothing Long sleeved clothing
Eye protection: Safety glasses
Hygiene measures: Avoid contact with skin, eyes and clothing.

8. SAFE HANDLING INFORMATION

Storage:
ROOM TEMPERATURE

Handling:	Use only in area provided with appropriate exhaust ventilation.
Safe handling advice:	Wear personal protective equipment. Remove and wash contaminated clothing before reuse.
Technical measures/storage conditions:	Keep containers tightly closed in a cool, well-ventilated place. Keep container tightly closed in a dry and well-ventilated place.
Stability:	Stable under recommended storage conditions.
Polymerization:	None under normal processing.
Hazardous decomposition products:	Chloride/Hydrochloric acid
Materials to avoid:	-
Conditions to avoid:	Exposure to air or moisture over prolonged periods.

Spills and Disposal:

Personal precautions:	Use personal protective equipment.
Environmental precautions:	Prevent product from entering drains.
Methods for cleaning up:	Sweep up and shovel into suitable containers for disposal.
Waste from residues / unused products:	Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.
Contaminated packaging:	Do not re-use empty containers

Fire/Explosion Hazards:

Suitable extinguishing media:	Use dry chemical, CO2, water spray or "alcohol" foam
Specific hazards:	Burning produces irritant fumes.
Unusual hazards:	None known
Special protective equipment for firefighters:	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear
Specific methods:	Water mist may be used to cool closed containers.

9. TOXICOLOGICAL INFORMATION

Product Information

Acute toxicity

Components	RTECS Number:	Selected LD50s and LC50s
DIELDRIN	IO1750000	Inhalation LC50 Rat : 13 mg/m³/4H Oral LD50 Rat : 38300 ug/kg Oral LD50 Mouse : 38 mg/kg Dermal LD50 Rabbit : 250 mg/kg

Chronic toxicity:	Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.
Local effects:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects:	May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Carcinogenic effects:	Possible carcinogen
Mutagenic effects:	No data is available on the product itself.

Reproductive toxicity: No data is available on the product itself.

Components	NIOSH - Health Effects	NIOSH - Target Organs
DIELDRIN		CNS, liver, skin, kidneys (in animals: lung, liver, thyroid and adrenal gland tumors)

10. ECOLOGICAL INFORMATION

Mobility: No data available
Bioaccumulation: No data available
Ecotoxicity effects: No data available
Aquatic toxicity: May cause long-term adverse effects in the aquatic environment.

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
DIELDRIN	Not Listed	DOT regulated severe marine pollutant	Original entry

Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
DIELDRIN	3	0.03 ug/L	Not Listed

Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
DIELDRIN	Not Listed	Not Listed	Not Listed

Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
DIELDRIN	Rank (of 275): 018	Not Listed	Maximum concentration = 0.24 ug/L; continuous concentration = 0.056 ug/L

Components	California - Priority Toxic Pollutants	California - Priority Toxic Pollutants
DIELDRIN	Water and organisms = 0.00014 ug/L; organisms only = 0.00014 ug/L	Maximum concentration = 0.71 ug/L; continuous concentration = 0.0019 ug/L

11. TRANSPORT INFORMATION

IMDG/IMO

Proper shipping name: Organochlorine, pesticide, solid, toxic
IMDG - Hazard Classifications Not Applicable
IMDG - Marine Pollutants Not Applicable
IMDG - Marine Pollutants Not Applicable
IMDG - Regulated Substances Not Applicable
IMDG - Severe Marine Pollutants Not Applicable

IMO-labels:

Packing group: II
Proper shipping name: Organochlorine, pesticide, solid, toxic
UN/Id No: 2761

ADR/RID

Australia Hazardous Statement: Hazardous according to criteria of NOHSC

Hazard Class	6.1
Item:	DIELDRIN
ADR/RID-labels:	Toxic
UN/Id No:	2761
Emergency Action Code (Hazchem code):	2X
Proper shipping name:	Organochlorine, pesticide, solid, toxic

ICAO:

Hazard Class	6.1
Packing group:	II
Proper shipping name:	Organochlorine, pesticide, solid, toxic

12. REGULATORY INFORMATION

International inventories:

DIELDRIN

Australia (AICS):	Present
Inventory - China:	Present
EU EINECS List -	200-484-5; C12H8Cl6O
Japan - Specified Chemical Substances	CLASS I; Products prohibited from import when containing Dieldrin: (1) wood preservatives, wood insecticides and wood fungicides, (2) paints (only those for preservatives, insecticides or fungicides,
Korean KECL:	KE-18415

Philippines PICCS: Present
Contains: DIELDRIN
Indication of Danger:
T+ - Very toxic.
N - Dangerous For The Environment.

Risk Phrases: R27 - Very toxic in contact with skin.
R40 - Limited evidence of a carcinogenic effect.
R53 - May cause long-term adverse effects in the aquatic environment.
R50 - Very toxic to aquatic organisms.
R48/25 - Toxic: danger of serious damage to health by prolonged exposure if swallowed.
R25 - Toxic if swallowed.

Safety Phrases: S61 - Avoid release to the environment. Refer to special instructions/Safety data sheets.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
S60 - This material and its container must be disposed of as hazardous waste.
S22 - Do not breathe dust.

Safety Combination Phrases:
S36/37 - Wear suitable protective clothing and gloves.

Poisons schedule No. (Aust)/Toxic Substance (NZ): S7 Dangerous Poison.

13. OTHER INFORMATION

Prepared by: Health & Safety

Disclaimer: The information and recommendations contained herein are based upon tests believed to be reliable. However, MP Biomedicals does not guarantee the accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRANTY, WHETHER EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage maybe required. MP Biomedicals assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet

APPENDIX F

Jobsite Safety Inspection Checklist

LANGAN

Job Safety Inspection Checklist
Health & Safety

LANGAN

Document #: HSE-HASP-JSIC-FRM-01	Version #: 01

Date: _____ **Inspected By:** _____

Location: _____ **Project #:** _____

Check one of the following: **A:** Acceptable **NA**: Not Applicable **D**: Deficiency

	A	NA	D	Remarks
1. HASP available on site for inspection?				
2. Health & Safety Compliance agreement (in HASP) appropriately signed by Langan employees and subcontractors?				
3. Hospital route map with directions posted on site?				
4. Emergency Notification List posted on site?				
5. First Aid kit available and properly stocked?				
6. Personnel trained in CPR/First Aid on site?				
7. SDSs readily available, and all workers knowledgeable about the specific chemicals and compounds to which they may be exposed?				
8. Appropriate PPE being worn by Langan employees and subcontractors?				
9. Project site safe practices ("Standing Orders") posted?				
10. Project staff have 40-hr./8-hr./Supervisor HAZWOPER training?				
11. Project staff medically cleared to work in hazardous waste sites and fit-tested to wear respirators, if needed?				
12. Respiratory protection readily available?				
13. Health & Safety Incident Report forms available?				
14. Air monitoring instruments calibrated daily and results recorded on the Daily Instrument Calibration check sheet?				
15. Air monitoring readings recorded on the air monitoring data sheet/field log book?				
16. Subcontract workers have received 40-hr./8-hr./Spvsr. HAZWOPER training, as appropriate?				
17. Subcontract workers medically cleared to work on site, and fit-tested for respirator wear?				
18. Subcontract workers have respirators readily available?				
19. Markouts of underground utilities done prior to initiating any subsurface activities?				

20. Decontamination procedures being followed as outlined in HASP?				
21. Are tools in good condition and properly used?				
22. Drilling performed in areas free from underground objects including utilities?				
23. Adequate size/type fire extinguisher supplied?				
24. Equipment at least 20 feet from overhead powerlines?				
25. Evidence that drilling operator is responsible for the safety of his rig.				
26. Trench sides shored, layed back, or boxed?				
27. Underground utilities located and authorities contacted before digging?				
28. Ladders in trench (25-foot spacing)?				
29. Excavated material placed more than 2 feet away from excavation edge?				
30. Public protected from exposure to open excavation?				
31. People entering the excavation regarding it as a permit-required confined space and following appropriate procedures?				
32. Confined space entry permit is completed and posted?				
33. All persons knowledgable about the conditions and characteristics of the confined space?				
34. All persons engaged in confined space operations have been trained in safe entry and rescue (non-entry)?				
35. Full body harnesses, lifelines, and hoisting apparatus available for rescue needs?				
36. Attendant and/or supervisor certified in basic first aid and CPR?				
37. Confined space atmosphere checked before entry and continuously while the work is going on?				
38. Results of confined space atmosphere testing recorded?				
39. Evidence of coordination with off-site rescue services to perform entry rescue, if needed?				
40. Are extension cords rated for this work being used and are they properly maintained?				
41. Are GFCIs provided and being used?				

Unsafe Acts: _____

_____

_____

_____

Notes: _____

_____

_____

_____

APPENDIX G

Job Safety Analysis Forms

LANGAN

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA TITLE:	**DATE CREATED:**
	CREATED BY:
JSA NUMBER:	**REVISION DATE:**
	REVISED BY:

Langan employees must review and revise the Job Safety Analysis (JSA) as needed to address the any site specific hazards not identified. Employees must provide their signatures on the last page of the JSA indicating they have review the JSA and are aware the potential hazards associated with this work and will follow the provided preventive or corrective measures.

PERSONAL PROTECTIVE EQUIPMENT REQUIRED: (PPE): ■ Required	☒ As Needed	
☐ Steel-toed boots	☐ Nitrile gloves	☐ Dermal Protection (Specify)
☐ Long-sleeved shirt	☐ Leather/ Cut-resistant gloves	☐ High visibility vest/clothing
☐ Safety glasses	☐ Face Shield	☐ Hard hat
ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT NEEDED (Provide specific type(s) or descriptions)		
☐ Air Monitoring:	☐ Respirators:	☐ Other:
☐ Dermal Protection:	☐ Cartridges:	☐ Other:

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE OR CORRECTIVE ACTION
1.	1. 2.	1a. 1b. 2a. 2b.
2.	1.	1
5.	1.	1.
Additional items identified in the field.		
Additional Items.		

If additional items are identified during daily work activities, please notify all relevant personnel about the change and document on this JSA.

LANGAN	Job Safety Analysis (JSA) Health and Safety
JSA Title: COVID-19 Awareness – Site Work **JSA Number: JSA046-02**	
A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.	

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Boots	☐ Long Sleeves	☐ Safety Vest (Class 2)	☐ Hard Hat	☐ Hearing Protection
☐ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☐ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Alcohol-based hand sanitizer, disinfectant wipes/spray				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. All Activities	1. Transmittal/exposure of COVID-19	1. Ask yourself and your managers – is this work essential? Can this be done remotely? 2. Stay home if sick or showing symptoms of COVID-19 (e.g. fever, cough, etc.). 3. Carry nitrile gloves, alcohol-based hand sanitizer, face coverings and disinfectant wipes/spray during field work. 4. Check federal, state, and/or local travel restrictions **prior** to travel. 5. Immediately notify Coronavirus Task Force (Using reporting buttons) if you display symptoms of COVID-19. Symptoms include cough, shortness of breath or difficulty breathing, fever or chills, sore throat, new loss of taste or smell, fatigue, muscle or body aches, headache, congestion or runny nose, nausea or vomiting, or diarrhea. 6. Notify Coronavirus Task Force (Using reporting buttons) if you had close contact with an individual who tested positive or displayed symptoms of COVID-19. 7. Do not touch your face, to the extent possible. 8. Wear face coverings when around other worker to minimize spread of COVID-19. (May be required in certain states or locations.) 9. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. Avoid gatherings of more than 10 people. Limit, to the extent possible, contact with public items/objects.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		10. Clean your hands frequently with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, sneezing, or using the rest room. 11. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry. 12. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. 13. Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, desks, toilets, faucets, and sinks.
2. Travel to Jobsite	1. Transmittal/exposure of COVID-19 between passengers 2. Transmittal/exposure of COVID-19 from previous occupants (rental and fleet vehicles) 3. Transmittal/exposure of COVID-19 while refueling	1. Limit the number of occupants to each vehicle to 2 people. Employees should sit as far away from each other as possible. 2. Disinfect high "hand-traffic" areas of the vehicle: Door handles, steering wheel, turn signal and control rods, dashboard controls, seatbelts, armrests, etc. To the extent possible, do not use recycled air for heat/AC and travel with the windows open. 3. Use hand sanitizer before and after pumping gas and only return to the inside of the vehicle after refueling is complete. 4. Wear nitrile gloves if available or disinfect the key pad, pump handle, and fuel grade button prior to use. 5. Recommend face coverings are worn to minimize spread of COVID-19.
3. Conduct Tailgate Safety Meeting & Complete H&S Paperwork	1. Transmittal/exposure of COVID-19 between meeting participants	1. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. 2. Recommend face coverings are worn when around other workers to minimize spread of COVID-19, 3. Hold meetings outside and keep in mind wind direction. To the extent possible, remain cross-wind from other people. 4. Designate a single person to maintain sign-in sheets/permits throughout the day to limit the passing of pens/clipboards between people. 5. Each person should complete their own JSA, even if they are completing similar tasks as others in order to limit the passing of paper/pens/clipboards between people. 6. Include COVID-19 topics and prevention measures in safety meetings.
4. Conduct Site Work	1. Transmittal/exposure of COVID-19 between site workers and public.	1. Practice social distancing maintaining 6 feet of distance between yourself and others. 2. Recommend face coverings are worn when around other workers to minimize spread of COVID-19, 3. To the extent possible, do not interact with the public. If it is necessary, politely explain you are practicing social distance and request they stay at least 6 feet away and they do not attempt to pass objects to you. 4. Wear nitrile gloves during site work underneath the appropriate gloves for your task. Utilize appropriate decontamination procedures, securely bag all waste (including nitrile gloves) generated during site work and dispose of. 5. Do not share tools. Each person should be equipped with the tools to complete their task or tasks should be divided to remove the need to share tools. If tools must be shared, surfaces should be disinfected. 6. Clean and disinfect surfaces of rental tools and equipment upon receipt. To the extent possible rent equipment from Langan's internal equipment reservation center, where

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		cleaning/disinfecting procedures can be verified.
5. Use of Construction Trailers	1. Transmittal/exposure of COVID-19 between site workers and others.	1. Avoid use of shared trailers, if possible. Minimize trailer use to essential personnel. 2. Practice social distancing; maintaining 6 feet of distance between yourself and others in trailer. 3. Clean and disinfect areas including desks, phones, chairs and other common areas, before and after use.
6. Purchasing Food from a Restaurant	1. Transmittal/exposure of COVID-19 from other customers, staff, surfaces.	1. To the extent possible, bring your own food. 2. If you must visit a restaurant, call ahead for take-out or "contactless delivery". Do not dine in. When picking up food, follow guidelines for Job Step #8: Purchasing Supplies at Retail/Shipping Centers. 3. Wash hands before and after eating.
7. Smoking Cigarettes	1. Transmittal/exposure of COVID-19 by touching mouth with hands	1. Cigarette smokers maybe at greater risk of complications arising from COVID-19. Nicotine patches/lozenges/gum, smoking cessation programs, and prescription medications may aid in "kicking the habit" if you decide to quit. 2. Wash hands thoroughly before and after smoking. 3. Discard cigarette butts properly. Do not light cigarettes from others and do not give cigarettes to others.
8. Hotel Stay	1. Transmittal/exposure of COVID-19 from previous occupants, hotel staff, common areas.	1. Verify the hotel chain/brand has modified cleaning procedures to reflect risk of COVID-19. Most hotel companies have issued statements on their websites and in email blasts reflecting these new procedures. 2. Use the front door, and not peripheral entrances. Front doors of hotels are generally automatic. 3. Request ground floor room to avoid elevator use and a room that has not be utilized in 48-72 hours. 4. If elevator use is required, do not directly touch elevator buttons with your hands. Do not ride elevators with other people, to the extent possible. 5. Bring disinfecting wipes or sanitizing spray. Upon arrival, disinfect high "hand-traffic" areas of the hotel room: Door handles, light switches, shower/sink faucet handles, TV remote, curtain/blind handles. Clean these surfaces daily. 6. Place the "Do Not Disturb" Sign on your door to prevent people (housekeeping) from entering your room. 7. Avoid common spaces and hotel sponsored events where crowds will be present. 8. Confirm hotel cleaning procedures have been modified to address COVID-19. Confirm no COVID-19 cases have occurred in hotel
9. Purchasing Supplies at Retail/Shipping Centers	1. Transmittal/exposure of COVID-19 from other customers, staff, surfaces.	1. Plan your travel to limit the need to visit retail/shipping centers. 2. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. If the store is too crowded/small, consider visiting another store or returning at a different time. 3. Avoid high "hand-traffic" items/areas like door handles (i.e. use your shoulder, hip/butt, or open with a disposable napkin/paper towel), credit cards terminals (i.e. use Apple/Android pay if available), shopping carts/baskets (i.e. bring your own shopping bags), counter tops (i.e. ask clerk if you can hold the items while they are scanned) and bulk/buffet items (i.e. just avoid them). 4. Disinfect your hands before and after visiting a retail/shipping center.

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Direct-Push Soil Borings
JSA Number: JSA004-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT REQUIRED:				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Half-face respirator, dust cartridges, PID (if applicable)				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Move equipment to work site	1. Back strain when lifting equipment	1. Use proper lifting technique (use legs for bending and lifting and not the back)/ Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle
	2. Slips/ Trips/ Falls while moving equipment	2. Use proper lifting technique (use legs for bending and lifting and not the back) / Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle / Have unobstructed path to vehicle or collection point / Do not lift/walk with boxes that are heavy/difficult to lift
	3. Traffic (if applicable)	3. Wear high visibility safety vests or clothing / Exercise caution
	4. Pinched fingers or running over toes during geoprobe set-up	4. Wear proper PPE (cut-resistant gloves) / Stay alert, be aware of geoprobe rig at all times
	5. Overturn drilling rig while transporting to loading dock on flat-bed tow truck	5. Drill rig should be parked in center of flat-bed tow truck / Emergency brake shall be used at all times during transport on the flat-bed truck/ All unnecessary personnel should stay away from the flat-bed truck during moving activities
2. Calibration of monitoring equipment	1. Skin or eye contact with calibration chemicals 2. Pinch fingers in monitoring equipment	1. Wear proper PPE (safety glasses/ goggles) 2. Wear proper PPE (leather gloves)
3. Set-up geoprobe rig	1. Geoprobe rig movement	1. All field personnel should stay clear of the geoprobe rig while moving / Use a spotter when backing up the geoprobe
4. Advance geoprobe rods below ground surface to desired depth	1. Underground utilities 2. High noise levels	1. Clean all subsurface soil borings to a minimum of 5 feet below grade 2. Wear proper PPE (hearing protection)
5. Remove and open acetate liner	1. Pinched fingers while removing macrocore 2. Cuts/lacerations when cutting acetate liner open	1. Wear proper PPE (nitrile gloves, cut-resistant or leather gloves 2. Wear proper PPE (cut-resistant or leather gloves)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Remove and open acetate liner (cont'd)	3. Exposure to hazardous vapors 4. Skin contact with contaminated soil	3. Do not place face over acetate liner when opening / Monitor hazardous vapors in air with PID / Upgrade PPE as necessary based on levels contained in the Health and Safety Plan 4. Wear proper PPE (nitrile gloves)
6. Sample Collections a) Monitor parameters b) Prepare sample containers and labels	1. Contact with potentially contaminated soil 2. Lacerations from broken sample bottles 3. Back strain while transporting full coolers 4. Internal exposure to contaminants and metals through inhalation of dust 5. Slips/ Trips/ Falls	1. Use monitoring devices / Wear proper PPE (safety glasses, nitrile gloves) 2. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage 3. Use proper lifting techniques / Do not lift heavy loads without assistance 4. Avoid creating dust / If necessary, wear a half mask respirator with applicable dust cartridge / Inspect respirator for damage and cleanliness prior to use / Clean respirator after each use and store in a clean, secure location 5. Be alert / Follow good housekeeping procedures
7. Remove excess soil from acetate liner and place in 55-gallon drum (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Cuts/lacerations from acetate liner 2. Pinched fingers/hand while opening/closing drum 3. Skin contact with contaminated soil 4. Soil debris in eyes	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (nitrile gloves) 4. Wear proper PPE (safety glasses)
8. Transport drums to central staging location (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Back, arm or shoulder strain from moving drums 2. Pinch fingers/hand in drum cart when moving drums 3. Pinch fingers/hand when operating lift-gate on vehicle 4. Contact with potentially contaminated groundwater when moving improperly sealed drums 5. Slips when moving drums 6. Drop drum on feet/toes	1. Use drum cart for moving drums / Use proper lifting techniques / Do not lift heavy loads without assistance 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (cut-resistant or leather gloves) 4. Wear proper PPE (nitrile gloves underneath work gloves) 5. Follow good housekeeping procedures / Ensure route to move drum and storage space is free from obstructions 6. Wear proper PPE (safety shoes) / Work in a safe manner to prevent dropped drum
9. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection

JSA Title: Direct-Push Soil Borings
JSA Number: JSA004-01

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
9. All activities (cont'd)	8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: 55-gallon Drum Sampling
JSA Number: JSA043-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☐ Hearing Protection
☒ Safety Glasses	☒ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☒ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: All Drums are required to be labeled. Langan employees do not open or move undocumented drums or unlabeled drums without proper project manager authorization.				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Unpack/Transport equipment to work area.	1. Back Strains 2. Slip/Trips/Falls 3. Cuts/Abrasions from equipment 4. Contusions from dropped equipment	1. Use proper lifting techniques/Use wheeled transport 2. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 3. Wear proper PPE (leather gloves, long sleeves). 4. Wear proper PPE (Langan approved safety shoes).
2. Open Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid. 2. Pressure from drums.	1. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches. 2. Open drum slowly to relieve pressure. Wear proper PPE: face shield and goggles; correct gloves; and over garments.
3. Collecting Soil/Fluid Sample	1. Irritation to eye from vapor, soil dust, or splashing 2. Irritation to exposed skin	1. Wear proper eye protection including safety glasses/ face shield/googles and when necessary, splash guard. If dust or vapor phase is present, wear appropriate safety breathing gear (1/2 mask or full face mask with correct filter) 2. Wear proper skin protection including nitrile gloves.
4. Closing Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid.	1. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches.

JSA Title: BLANK
JSA Number: 12345678

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Moving Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid. 2. Back Strains	1. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches. 2. Use proper lifting techniques/Use wheeled transport
6. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN	Job Safety Analysis (JSA) Health and Safety
JSA Title: Environmental Sampling **JSA Number:** JSA021-01	
A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.	**S** – ***Stop,*** *what has changed?* **T** – ***Think*** *about the task* **E** – ***Evaluate*** *potential hazards* **P** – ***Plan*** *safe approach* **S** - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☐ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☐ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☒ Fire Resistant Clothing	☐ Rubber Boots
☒ Insect/Animal Repellent	☒ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Tyvek Sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Drive to sample location	1. Rough/Off Road terrain	1. Pay attention to road conditions such as road erosion, unprotected embankments, and soft road conditions.
2. Sample Collection (Walking)	1. Slip/Trips/Falls 2. Back strains 3. Wildlife (Insects, Stray animals, rodents) 4. Poisonous vegetation	1. Minimize distance to sample area/ Plan route and check surface prior to carrying heavy equipment/ Locate safest access point/ Follow good housekeeping procedures/ Mark significant below grade hazards (holes, trenches) with spray paint or cones/ Wear foot protection with ankle support and gripping soles. 2. Use proper lifting techniques/ Use wheeled transport/ Obtain assistance where and when needed/ Consider load weight when evaluating what is safe and unsafe to carry. 3. Be aware of surroundings for the presence of wildlife/ Do not approach stray animals/ Carry and use animal repellant when needed/ Use bug spray when needed. 4. Keep skin covered/ Identify and avoid poisonous vegetation/ Clean areas after contact with suspected vegetation.
3. Sample Collection (Water)	1. Drowning Hazards 2. Chemical burns (when adding acid preservative to sample) 3. Back Strains 4. Ergonomic issues 5. Slip/Trips/Falls	1. Use buddy system/ Wear flotation vest if water is deeper than 2 feet or swift moving/ Select working area with stable footing/ Do not attempt to cross or stand in swift moving water. 2. Wear proper PPE (Nitrile gloves, Tyvek Sleeves) 3. Use proper lifting techniques/ Use wheeled transport/ Obtain assistance where and when needed/ Consider load weight when evaluating what is safe or unsafe to carry. 4. When possible avoid bending over for long periods of time/ Use a small

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		stool for sitting or knee pad for kneeling. 5. Minimize distance to sample area/ Plan route and check surface prior to carrying heavy equipment/ Locate safest access point/ Follow good housekeeping procedures/ Mark significant below grade hazards (holes, trenches) with spray paint or cones/ Wear foot protection with ankle support and gripping soles/ Avoid standing water or slippery terrain.
4. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Equipment Transportation and Set-up
JSA Number: JSA012-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniuqes / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Moving equipment to its planned location	1. Pinch Hazard 2. Slips/ Trips/ Falls	1. Wear proper PPE (leather gloves) 2. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint
3. Equipment Set-up	1. Pinch Hazard 2. Cuts/abrasions to knuckles/hands 3. Back Strain	1. Wear proper PPE (leather gloves) 2. Wear proper PPE (leather gloves) 3. Use proper lifting techniques / Use wheeled transport
4. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
4. All activities (cont'd)	10. Eye Injuries	6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Excavation Oversight
JSA Number: JSA041-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/Trips/Falls 3. Traffic 4. Cuts/abrasions/contusions from equipment	1. Use proper lifting techniques / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves, safety shoes)
2. Earth Moving Equipment	1. Equipment running over employee	1. Ensure you have direct line of sight with operator of equipment; don't walk behind equipment; maintain a safe distance away from equipment. 2. Wear proper PPE (high vis vest/clothing)
3. Excavation	1. Excavation collapse 2. Confined space 3. Soil	1. Use proper shoring/benching/sloping techniques; Ladder is properly situated in excavation; no water in excavation; competent person has inspected excavation prior to allow employees to enter. 2. Langan employees are not authorized to enter a confined space; 3. Soil and equipment is kept atleast 2 feet from edge of excavation
4. Excavated soil	1. Hazardous substances	1. Use proper equipment to monitor excavated soil for contaminates; ensure levels do not exceed PEL's for contaminates; Wear proper PPE
5. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.)	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear proper PPE (Langan approved safety shoes) 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Field Sampling
JSA Number: JSA022-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task / **Stop** & regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☐ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Unpack/Transport equipment to work area.	1. Back Strains 2. Slip/Trips/Falls 3. Cuts/Abrasions from equipment 4. Contusions from dropped equipment	1. Use proper lifting techniques/Use wheeled transport 2. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 3. Wear proper PPE (leather gloves, long sleeves). 4. Wear proper PPE (Langan approved safety shoes).
2. Initial Site Arrival-Site Assessment	1. Traffic	1. Situational awareness (be alert of your surroundings). Secure area from through traffic.
3. Surface Water Sampling	1. Contaminated media. Skin/eye contact with biological agents and/or chemicals.	1. Wear appropriate PPE (Safety glasses, appropriate gloves). Review (M)SDS for all chemicals being.
4. Sampling from bridges	1. Struck by vehicles	1. Wear appropriate PPE (Safety Vest). Use buddy system and orange safety cones.
5. Icing of Samples/ Transporting coolers/equipment from work area.	1. Back Strains 2. Slips/Trips/Falls 3. Cuts/Abrasions from equipment 4. Pinch/Crushing Hazards.	1. Drain coolers of water. Use proper lifting techniques. Use wheeled transport. 2. Have unobstructed path from work area. Aware of surroundings. 3. Wear proper PPE (Leather gloves, long sleeves) 4. Wear proper PPE (Leather gloves, long sleeves)
6. Site Departure	1. Contaminated PPE/Vehicle	1. Contaminated PPE should be disposed of on-site. Remove boots and soiled clothing for secure storage in trunk. Wash hands promptly.
7. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: General Construction Activities
JSA Number: JSA010-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniuqes / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Installation of piping from vapor wells to skid connections and fro mdischarge pipping to effluent stack	1. Pinch fingers when connecting pipes 2. Slips/ Trips/ Falls 3. Machinery Hazards	1. Wear proper PPE (leather gloves) 2. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint 3. Wear proper PPE (safety vest) / Maintain safe distance from operating machinery
3. Remediation equipment installation	1. Back strain when lifting heavy equipmet 2. Slips/ Trips/ Falls 3. Traffic	1. Use proper lifting techniques / Use wheeled transport / Minimize distance to vehicle 2. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray pain 3. Wear proper PPE (safety vest)
4. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes

JSA Title: General Construction Activities
JSA Number: JSA010-01

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
4. All activities (cont'd)	6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Groundwater Sampling
JSA Number: JSA008-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – ***Stop,*** *what has changed?*
T – ***Think*** *about the task*
E – ***Evaluate*** *potential hazards*
P – ***Plan*** *safe approach*
S - ***Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☒ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Tyvek sleeves, Dermal Protection, PID				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniuqes / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Remove well cover	1. Scrape knuckles/hand 2. Strain wrist/bruise plam 3. Pinch fingers or hand	1. Wear proper PPE (leather gloves) 2. Using a hammer, tap the end of the wrench to loosen grip of bolts 3. Wear proper PPE (leather gloves)
3. Remove well cap and lock	1. Well can pops from pressure 2. Exposure to hazardous substances through inhalation or dermal exposure 3. Scrape knuckles/hand 4. Strain write/bruise palm	1. Remove cap slowly to relieve pressure / Do not place face over well when opening / Wear proper PPE (safety glasses) 2. Use direct air monitoring/reading instrument (i.e. PID) / Be familiar with and follow actions prescribed in the HASP / Wear proper PPE (nitrile gloves) 3. Wear proper PPE (leather gloves) 4. Using hammer, tap the end of the wrench to loosen grip
4. Measure head-space vapor levels	1. Exposure to hazardous substances through inhalation	1. Do not place face over well when collecting measurement
5. Remove deciated tubing (if necessary)	1. Exposure to hazardous substances through inhalation or dermal exposure 2. Tubing swings around after removal	1. Wear proper PPE (nitrile gloves, Tyvek sleeves) 2. Wear proper PPE (safety glasses)
6. Set-up plastic sheeting for work site around the well	1. Lacerations when cutting plastic sheeting	1. Use scissors to cut plastic sheeting / Cut motions should always be away from body and body parts

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
7. Measure depth to water	1. Exposure to hazardous substances through inhalation or dermal exposure 2. Pinch fingers or hand in water level instrument	1. Wear proper PPE (nitrile gloves) 2. Wear proper PPE (leather gloves)
8. Calibrate monitoring equipment	1. Skin or eye contact with calibration chemicals 2. Pinch fingers or hand in monitoring equipment	1. Wear proper PPE (safety glasses, nitrile gloves) 2. Wear proper PPE (leather gloves) / Avoid pinch points
9. Install sampling pump in well	1. Hand injuries during installation of pump 2. Lacerations when cutting tubing 3. Back strain during installation of pump 4. Physical hazards associated with manual lifting of heavy equipment 5. Back strain from starting generator 6. Burns from hot exhaust from generator 7. Electrical shock from improper use of generator and pump 8. Contaminated water spray from loose connections	1. Wear proper PPE (leather gloves, nitrile gloves) 2. Use safey tubing cutter 3. Use proper lifting techniques 4. Use proper lifting techniques / Use wheeled transport for heavy equipment 5. Use arm when starting generator / Do not over-strain if generator does not start 6. Do not touch generator near exhaust / Use proper handle to carry / Allow generator to cool down before moving 7. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord 8. Check all tubing connections to ensure they are tight and secure
10. Purge water	1. Contact with potentially contamined groundwater 2. Back strain from lifting buckets of water 3. Tripping potential on sample discharge lines and pump electric line	1. Wear proper PPE (safety glasses, nitrile gloves) 2. Use proper lifting techniques / Use wheeled transport 3. Organize discharge of electric line to keep out of way as much as possible / Mark potential tripping hazards with caution tape or safety cones
11. Sample water collection	1. Contact with potentially contaminated groundwater through dermal exposure 2. Contact with and burns from acid used for sample preservation 3. Tripping potential on sample discharge lines and pump electric line 4. Lacerations from broken sample bottles 5. Back strain when transporting coolers full of collected samples 6. Slips/ Trips/ Falls	1. Wear proper PPE (safety glasses, nitrile gloves) 2. Wear proper PPE (safety glasses, nitrile gloves) / Ensure sample bottle lids are secure before use and after sample collection 3. Organize line to keep out of the way as much as possible / Mark potential tripping hazards with caution tape or safety cones 4. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage / Wrap glass bottles in bubble wrap, if possible 5. Use proper lifting techniques / Use wheeled transport / Seek assistance if coolers weight exceeds 50lbs. / Minimize distance to vehicle 6. Have unobstructed path to vehicle or collection point / Follow good housekeeping procedures / Do not lift/walk with coolers that are too heavy/difficult to lift
12. Remove pump and pack up equipment	1. Back strain when removing pump or lifting heavy equipment	1. Use proper lifting technique / Use wheeled transport for heavy equipment
13. Replace well cap and lock	1. Scrape fingers/hand 2. Strain wrist/bruise palm	1. Wear proper PPE (leather gloves) 2. Using hammer, tap the end of the well cap to tighten grip
14. Replace well cover	1. Scrape knuckles/hand 2. Strain write/bruise palm 3. Pinch fingers or hand	1. Wear proper PPE (leather gloves) 2. Using hammer, tap the end of the wrench to tighten the grip of the bolts 3. Wear proper PPE (leather gloves)
15. Transport drums to disposal staging location	1. Back, arm or shoulder strain from moving drums 2. Pinch hazard 3. Contact with potentially contaminated groundwater when moving improperly sealed	1. Use drum cart for moving drums / Use proper lifting techniques / Obtain assistance, if needed 2. Wear proper PPE (leather gloves) 3. Wear proper PPE (nitrile gloves under leather gloves) / Properly seal drum to prevent leak

JSA Title: Groundwater Sampling
JSA Number: JSA008-01

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	drums 4. Slips/ Trips/ Falls when moving drum 5. Drop drum on feet/toes	4. Ensure route to move drum to storage space is dry and free from obstructions 5. Wear proper PPE (safety shoes)
16. Place used PPE in designated dispoal drum	1. Pressure build-up inside drum 2. Pinch hazard	1. Remove cap from bung hole in drum to relieve pressure 2. Wear proper PPE (leather gloves)
17. Decontaminate equipment	1. Splashing water/soap from decontamination 2. Contact with potentially contaminated groundwater through dermal exposure 3. Electrical shock from broken electric cords	1. Wear proper PPE (safety glasses) 2. Wear proper PPE (safety glasses, dermal protection) 3. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord
18. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		

JSA Title: Groundwater Sampling
JSA Number: JSA008-01

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Hand Auger Soil Sampling
JSA Number: JSA003-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – Stop, *what has changed?*
T – Think *about the task*
E – Evaluate *potential hazards*
P – Plan *safe approach*
S - Start *task /* **Stop** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT REQUIRED:				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Half-face respirator, dust cartridges, PID (if applicable)				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Unpack equipment	1. Slips/ Trips/ Falls 2. Physical hazards including strains and hand injury	1. Be aware of hazards in area/ Place safety cones in areas of potential slips/trips/falls 2. Use proper lifting techniques / Do not lift heavy loads without assitance / Avoid putting hands near pinch points / Wear proper PPE (leather gloves)
2. Calibration of monitoring equipment	1. Skin or eye contact with calibration chemicals 2. Pinch fingers in monitoring equipment	1. Wear proper PPE (safety glasses/ goggles) 2. Wear proper PPE (leather gloves)
3. Advancing and removing hand auger	1. Physical hazards including back strain and hand injury	1. Twist auger using arms and shoulders/ Do not over exert / Keep back in neutral position, bend at the knees / Request assistance when needed / Remove auger from ground keeping back in neutral position and lift using legs
4. Sample collections a) Monitor parameters b) Prepare sample containers and labels c) Collect soil sample d) Securely cap containers, label and store in sample cooler until shipping e) Deliver cooler to lab or courier to lab	1. Contact with potentially contaminated soil 2. Lacerations from broken sample bottles 3. Back strain with transporting coolers 4. Internal exposure to contaminants through inhalation of dust 5. Slips/ Trips/ Falls	1. Use monitoring devices / Wear proper PPE (safety glasses, nitrile gloves) 2. Do not over-tighten bottles caps / Handle bottles safety to prevent breakage 3. Use proper lifting techniques / Do not lift heavy loads without assistance 4. Avoid creating dust / If necessary, wear a half-face respirator with applicable dust cartridges / Inspect respirator for damage and cleanliness prior to use / Clean respirator after each use and store in a clean, secure location 5. Be alert / Follow good housekeeping procedures
5. Decontamination of equipment	1. Splashing water/soap from decontamination 2. Contact with potentially contaminated soil	1. Wear proper PPE (safety glasses, gloves) 2. Wear proper PPE (safety glasses, gloves)
6. All activities	1. Slips/ Trips/ Falls	1. Be aware of potential trip hazards / Follow good housekeeping

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
6. All activities (cont'd)	2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Monitoring Well Development
JSA Number: JSA026-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – *Stop,* what has changed?
T – *Think* about the task
E – *Evaluate* potential hazards
P – *Plan* safe approach
S - *Start* task / *Stop* & regroup

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☐ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Tyvek Sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strains 2. Slips/Trips/Falls 3. Traffic 4. Cuts/Abrasions/Contusions from equipment	1. Use proper lifting techniques/ Use wheeled transport/ use buddy system when lifting equipment. 2. Minimize distance from work area/ unobstructed path to collection points and vehicle/ Follow good housekeeping procedures. 3. Wear high-visibility vest or clothing/Exercise caution/ Use traffic cones or signage if needed. 4. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes).
2. Measure depth of water	1. Exposure to hazardous substances 2. Pinched fingers	1. Wear proper PPE (Nitrile gloves, Safety glasses/Face shield). 2. Wear proper PPE (cut-resistant gloves).
3. Install Tremie pipe in the monitoring well and connect to water source.	1. Hand injuries during installation (pinched fingers/hands). 2. Back strain from holding Tremie pipe. 3. High pressure water spray.	1. Wear proper PPE (Nitrile gloves/cut-resistant gloves). 2. Use proper lifting techniques/ Use two personnel when lowering pump greater than 80 feet. 3. Ensure all hose connections are tight and secure/ Use proper PPE (face shield and safety glasses).
4. Install pump in to well a. Connect pump to sample tubing. b. Lower pump to desired depth in well. c. Connect sample tubing to flow cell d. Connect pump to power source	1. Hand injuries during pump installation and sample tubing cutting. 2. Back strain 3. Electric shock 4. Exhaust gases from generator 5. Burns from hot equipment	1. Wear proper PPE when installing pump and cutting sample tubing (Nitrile and cut-resistant gloves)/ Use tubing cutter. 2. Proper lifting techniques/ Two personnel when installing pump at depths greater than 80 feet/ Use buddy when lifting heavy loads (pump, generator)/Use wheeled transport. 3. Ensure equipment is (LO/TO: locked out/tagged out) prior to preforming any electrical connections/ Inspect wires for frays or cuts/Ensure generator is properly grounded prior to starting.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
(generator) e. Turn on power source (generator)		4. Position generator so that exhaust is flowing away from work area. 5. Do not touch exhaust or any hot part of generator/ Allow equipment time to cool down prior to carrying/ Use proper PPE (long sleeves, leather gloves)
5. Develop monitoring well a. Jet water into well using Tremie pipe b. Turn pump on and adjust to desired flow rate. c. Surge pump up and down well to remove sediment from screen d. Containerize all purge water from well.	1. Hand injuries 2. Face injuries 3. Contaminated spray from water	1. Wear proper PPE (cut-resistant gloves and nitrile gloves). 2. Wear proper PPE (face shield and safety glasses)/do not stand over well opening. 3. Wear proper PPE (Face shield and safety goggles)/Tyvek over garments/ Ensure all connections are secure and tight/ Tubing outlet is contained in an overflow container.
6. Drum staging area.	1. Back, Arm, and shoulder strain. 2. Pinch points 3. Cross contamination 4. Slip/Trips/Falls	1. Use proper lifting techniques/ Use drum carts when moving drums/ use buddy system for moving of drums if needed/Move drums shortest distance needed. 2. Keep fingers and feet away from pinch points/ Use proper PPE (cut-resistant gloves, Langan approved safety shoes) 3. Use proper PPE (Nitrile gloves, Tyvek sleeves) 4. Ensure pathway is clear prior to moving equipment/ Mark all hazards/ Use additional person as a spotter if needed.
7. Equipment pack-up	1. Back Strains 2. Slips/Trips/Falls 3. Traffic 4. Cuts/Abrasions/Contusions from equipment.	1. Use proper lifting techniques/ Use wheeled transport/ use buddy system when lifting equipment. 2. Minimize distance from work area/ Unobstructed path to collection points and vehicle/ Follow good housekeeping procedures. 3. Wear high-visibility vest or clothing/Exercise caution/ Use traffic cones or signage if needed. 4. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes).
8. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses.
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Subsurface Investigation
JSA Number: JSA030-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – Stop, *what has changed?*
T – Think *about the task*
E – Evaluate *potential hazards*
P – Plan *safe approach*
S - Start *task /* **Stop** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☒ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Dielectric Overshoes, Sun Block				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back/strain 2. Slip/Trip/Falls 3. Traffic 4. Cuts/abrasions/contusions from equipment 5. Accidents due to vehicle operations	1. Use proper lifting techniques/Use wheeled transport 2. Minimize distance to work area/unobstructed path to work area/follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes) 5. Observe posted speed limits/ Wear seat belts at all times
2. Traffic	1. Hit by moving vehicle	1. Use traffic cones and signage/ Use High visibility traffic vests and clothing/ Caution tape when working near active roadways.
3. Field Work (drilling, resistivity testing, and inspection)	1. Biological Hazards: insects, rats, snakes, poisonous plants, and other animals 2. Heat stress/injuries 3. Cold Stress/injuries 4. High Energy Transmission Lines 5. Underground Utilities 6. Electrical (soil resistivity testing)	1. Inspect work area to identify biological hazards. Wear light colored long sleeve shirt and long pants/ Use insect repellant as necessary/ Beware of tall grass, bushes, woods and other areas where ticks may live/ Avoid leaving garbage on site to prevent attracting animals/ Identify and avoid contact with poisonous plants/Beware of rats, snakes, or stray animals. 2. Wear proper clothing (light colored)/ drink plenty of water/ take regular breaks/use sun block 3. Wear proper clothing/ dress in layers/ take regular breaks. 4. Avoid direct contact with high energy transmission lines/ position equipment at least 15 feet or as required by PSE&G from the transmission lines/ wear proper PPE (dielectric overshoes 15 kV minimum rating). 5. Call one-call service before performing intrusive field work/ Review utility mark-outs and available utility drawings (with respect to proposed work

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		locations)/ Follow Underground Utility Guidelines 6. See AGI Sting R1 operating manual for specific concerns during operating instrument
4. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	7. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 8. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 9. Wear Langan approved safety shoes 10. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 11. Wear high visibility clothing & vest / Use cones or signs to designate work area 12. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 13. Wear proper hearing protection 14. Wear hard hat / Avoid areas were overhead hazards exist. 15. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 16. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Surface Water Sampling
JSA Number: JSA009-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – Stop, *what has changed?*
T – Think *about the task*
E – Evaluate *potential hazards*
P – Plan *safe approach*
S - Start *task /* **Stop** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT REQUIRED:				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☒ Life Vest/Jacket	
☐ Other				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work site	1. Back strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniques / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Collect water samples	1. Potential drowning hazard working around water 2. Contact with potentially contaminated water through dermal exposure 3. Contact and burns from acid used for sample preservation 4. Lacerations from broken sample bottles 5. Back strain when transporting cooler full of collected samples 6. Slips/ Trips/ Falls	1. Always work with a partner when working around water / Wear proper PPE when working in moving water or water deeper than 2ft. (floatation device- i.e. Life vest/jacket) / Select a working area where the footing is stable / Do not stand in or attempt to cross swift moving water 2. Wear proper PPE (safety glasses, nitrile gloves) 3. Wear proper PPE (safety glasses, nitrile gloves) / Ensure sample bottle lids are secure before use and after sample collection 4. Do not over-tighten bottle caps / Handle bottles safely to avoid breakage / Wrap glass bottles in bubble wrap, if possible 5. Use proper lifting techniques / Use wheeled transport / Seek assistance if cooler's weight exceeds 50lbs. / Minimize distance to vehicle 6. Have unobstructed path to vehicle or collection point / Follow good housekeeping procedures / Do not lift/walk with coolers that are too heavy/difficult to lift
3. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
3. All activities (cont'd)	4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Test Pits
JSA Number: JSA016-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – Stop, *what has changed?*
T – Think *about the task*
E – Evaluate *potential hazards*
P – Plan *safe approach*
S - Start *task /* **Stop** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniques / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Digging Test Pit	1. Back Strain 2. Unstable walls of excavation	1. Observe proper digging technique. Ensure spoil pile and equipment are at least 2 feet from edge of excavation. 2. Excavate test pit in a stepped manor.
3. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection

JSA Title: Test Pits
JSA Number: JSA016-01

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
3. All activities (cont'd)		8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Well Installation
JSA Number: JSA019-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

S – *Stop,* what has changed?
T – *Think* about the task
E – *Evaluate* potential hazards
P – *Plan* safe approach
S - *Start* task / *Stop* & regroup

PERSONAL PROTECTIVE EQUIPMENT REQUIRED:				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: PID, Tyvek sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Move equipment to work site	1. Back strain when lifting equipment 2. Slips/ Trips/ Falls while moving equipment 3. Traffic (if applicable) 4. Pinched fingers or running over toes during geoprobe set-up 5. Overturn drilling rig while transporting to loading dock on flat-bed tow truck	1. Use proper lifting technique (use legs for bending and lifting and not the back)/ Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle 2. Use proper lifting technique (use legs for bending and lifting and not the back) / Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle / Have unobstructed path to vehicle or collection point / Do not lift/walk with boxes that are heavy/difficult to lift 3. Wear high visibility safety vests or clothing / Exercise caution 4. Wear proper PPE (cut-resistant gloves) / Stay alert, be aware of geoprobe rig at all times 5. Drill rig should be parked in center of flat-bed tow truck / Emergency brake shall be used at all times during transport on the flat-bed truck/ All unnecessary personnel should stay away from the flat-bed truck during moving activities
2. Calibration of monitoring equipment	1. Skin or eye contact with calibration chemicals 2. Pinch fingers in monitoring equipment	1. Wear proper PPE (safety glasses/ goggles) 2. Wear proper PPE (leather gloves)
3. Set-up geoprobe rig	1. Geoprobe rig movement	1. All field personnel should stay clear of the geoprobe rig while moving / Use a spotter when backing up the geoprobe
4. Advance geoprobe rods below ground surface to desired depth	1. Underground utilities 2. High noise levels	1. Clean all subsurface soil borings to a minimum of 5 feet below grade 2. Wear proper PPE (hearing protection)
5. Remove and open acetate	1. Pinched fingers while removing macrocore	1. Wear proper PPE (nitrile gloves, cut-resistant or leather gloves

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
liner 5. Remove and open acetate liner (cont'd)	2. Cuts/lacerations when cutting acetate liner open 3. Exposure to hazardous vapors 4. Skin contact with contaminated soil	2. Wear proper PPE (cut-resistant or leather gloves) 3. Do not place face over acetate liner when opening / Monitor hazardous vapors in air with PID / Upgrade PPE as necessary based on levels contained in the Health and Safety Plan 4. Wear proper PPE (nitrile gloves)
6. Remove excess soil from acetate liner and place in 55-gallon drum (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Cuts/lacerations from acetate liner 2. Pinched fingers/hand while opening/closing drum 3. Skin contact with contaminated soil 4. Soil debris in eyes	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (nitrile gloves) 4. Wear proper PPE (safety glasses)
7. Attach hollow-stem augers to the geoprobe rig; Advance augers and attach additional augers until desired depth is reached	1. Strain wrist/bruise palm 2. Pinched fingers 3. Back Strain 4. Clothing entanglement 5. Carbon monoxide poisoning 6. Bruise toes/foot 7. High noise levels 8. Skin contact with contaminated soil	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Use proper lifting techniques 4. Wear proper work attire(no loose clothing/strings) 5. Properly ventilate work area 6. Wear proper PPE (safety shoes) 7. Wear proper PPE (hearing protection) 8. Wear proper PPE (Tyvek sleeves, nitrile gloves)
8. Install monitoring well	1. Pinched fingers 2. Lacerations/abrasions 3. Back Strain	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Use proper lifting techniques
9. Tremie-grout annulus space above bentonite seal	1. Back strain 2. Pinched fingers	1. Use proper lifting techniques 2. Wear proper PPE (cut-resistant or leather gloves)
10. Install flush-mount monitoring well pad	1. Splashed concrete 2. Pinched fingers 3. Cuts/lacerations	1. Wear proper PPE (safety glasses) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (cut-resistant or leather gloves)
11. Decontaminate equipment	1. Splashing water/soap 2. Contact with potentially contaminated groundwater/soil through dermal exposure 3. Electrical shock from broken electric cords	1. Wear proper PPE (safety glasses) 2. Wear proper PPE (safety glasses, dermal protection) 3. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord
12. Transport drums to central staging location (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Back, arm or shoulder strain from moving drums 2. Pinch fingers/hand in drum cart when moving drums 3. Pinch fingers/hand when operating lift-gate on vehicle 4. Contact with potentially contaminated groundwater when moving improperly sealed drums 5. Slips when moving drums 6. Drop drum on feet/toes	1. Use drum cart for moving drums / Use proper lifting techniques / Do not lift heavy loads without assistance 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (cut-resistant or leather gloves) 4. Wear proper PPE (nitrile gloves underneath work gloves) 5. Follow good housekeeping procedures / Ensure route to move drum and storage space is free from obstructions 6. Wear proper PPE (safety shoes) / Work in a safe manner to prevent dropped drum
13. All activities	1. Slips/ Trips/ Falls	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
13. All activities (cont'd)	2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

APPENDIX H

Tailgate Safety Briefing Form

LANGAN

Tailgate Safety Briefing Form Health & Safety	LANGAN
Document #: HSE-HASP-TSB-FRM-01	Version #: 01

Date:_____ Time: _____

Leader:_____ Location:_____

Work Task: _____

SAFETY TOPICS (*provide some detail of discussion points*)

Chemical Exposure Hazards and Control:_____

_____

Physical Hazards and Control: _____

Air Monitoring: _____

PPE: _____

Communications:_____

Safe Work Practices: _____

_____

Emergency Response: _____

Hospital/Medical Center Location: _____

Phone Nos.: _____

Other: _____

FOR FOLLOW-UP (the issues, responsibilities, due dates, etc.**)**

_____

_____

_____

ATTENDEES

PRINT NAME	COMPANY	SIGNATURE

APPENDIX D

PCB Notification and Certification

LANGAN

15 September 2022

Katherine Woodward, Senior PCB Cleanup Project Manager
United States Environmental Protection Agency
5 Post Office Square OSRR07-02
Boston, MA 02109-3912

RE: Written Certification Required Under §761.61(a)(3)(E)
Remedial Action Plan
Western Middle School
1 Western Junior Highway
Greenwich, CT 06830

Dear Ms. Woodward:

I certify that all sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize PCB contamination at the Western Middle School site, are on file at Langan CT, Inc. offices located at 555 Long Wharf Drive, New Haven, Connecticut, and are available for EPA inspection.

If you have any questions, comments, or concerns you may contact Ryan Wohlstrom via phone at 203-784-3069 or via email at rwohlstrom@langan.com.

Sincerely,

Daniel M. Watson, Director of School Facilities
Greenwich Public Schools
Town of Greenwich, Connecticut

Ryan J Wohlstrom
Senior Project Manager
Langan CT Inc.

cc: Dr. Toni Jones, GPS
Ryan Wohlstrom, Langan
Jamie Barr, Langan
Jeffrey Wilcox, CTDEEP
Kevin Neary, CTDEEP

APPENDIX E

Public Notice Materials

LANGAN

XX July 2022

[Insert recipient's address]

RE: Notification of Remediation
Western Middle School
Greenwich, CT 06830
Langan Project No.: 140148201

Dear [Insert recipient's name]:

On behalf of the Greenwich Public Schools, Langan CT, Inc. (Langan) is providing notice of planned environmental remediation at the Western Middle School property located at 1 Western Junior Highway in Greenwich, Connecticut. This notice is being provided in accordance with §761.61(c) of Chapter 40 of the Code of Federal Regulations (CFR), Section 22a-133x of the Connecticut General Statutes (CGS), and Sections 2a-133k-2(f)(2) and 22a-133k-1(d) of the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulations (RSRs).

The objective of the remediation is to address impacted soil containing pesticides and metals underlying the recreational area located northeast of the school buildings and to address historic fill containing volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, and metals underlying the athletic fields located east of the school buildings. Remediation of the recreational area will include the excavation and proper off-site disposal of impacted soil. Remediation of the athletic fields will include the excavation and proper off-site disposal of historic fill to a minimum depth of two feet below ground surface, the construction of Engineered Controls (ECs) to isolate deeper remaining historic fill, and the placement of an Environmental Use Restriction (EUR) on the property to prohibit actions that would disturb the ECs or expose remaining historic fill. The ECs consist of a minimum two-foot thick layer of clean soil and/or stone underlying the following three finished surfaces:

- Artificial turf fields located at the existing baseball, softball, and soccer fields;
- Asphalt and/or concrete pavement located at future walkways and driveways; and
- Natural grass landscaping located at existing sloped areas and wooded areas.

Locations of the proposed excavation areas are provided on Figure 1 and locations of the proposed ECs are provided on Figure 2. The remediation work is anticipated to be performed throughout the 2023 and 2024 school year.

A Remedial Action Plan (RAP) has been submitted to the CTDEEP and the United States Environmental Protection Agency (USEPA), and the public may comment on that plan for a periof of 45 days following the date of this letter. Copies of the RAP and an Engineered Control Variance Request (ECVR) are available for review at the CTDEEP and on the Greenwich Public Schools website at www.greenwichschools.org.

The Town of Greenwich and the Greenwich Public Schools are planning to hold a public meeting to provide additional information to the community and provide additional opportunity for comment. Representatives from the CTDEEP and the United States Environmental Protection Agency will also be available to answer questions. The public meeting will be held in person at the Town of Greenwich Town Hall and also provided via Zoom beginning at 6:00 pm on XX June 2022. The Zoom meeting may be joined using the following link: www.zoom.com or by calling XXX-XXX-XXXX Webinar ID: XXXXXX. If you have any comments pertaining to the public meeting please contact Daniel M. Watson, Director of School Facilities, for the Greenwich Public Schools daniel_watson@greenwich.k12.ct.us or (203) XXX-XXXX.

If you have any questions pertaining to the planned remediation, please contact Jeff Wilcox of the CTDEEP at (860) 424-3902 or jeff.wilcox@ct.gov. Written comments on the proposed RAP and ECs may be submitted in writing to the Commissioner of the CTDEEP, c/o Jeff Wilcox, Remediation Division, 79 Elm Street, Hartford, CT 06106 for a period of 45 days following the date of this letter.

Sincerely,

Langan CT, Inc.

Ryan J. Wohlstrom
Senior Project Manager

Enclosure(s): Figure 1 – Site Location Map
Figure 2 – Remedial Excavation Location Plan
Figure 3 – Engineered Controls Location Plan

cc: Daniel M. Watson, GPS
Dr. Toni Jones, GPS
Jamie Barr, Langan
Jeffrey Wilcox, CTDEEP
Kevin Neary, CTDEEP

To be published in the Greenwich Time newspaper

Notice of Remedial Action Plan
Western Middle School
1 Western Junior Highway
Greenwich, CT

In accordance with §761.61(c) of Chapter 40 of the Code of Federal Regulations (CFR), Section 22a-133x of the Connecticut General Statutes (CGS), and Sections 2a-133k-2(f)(2) and 22a-133k-1(d) of the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulations (RSRs), notice is hereby given that environmental remediation is being planned for portions of the Western Middle School property, located at 1 Western Junior Highway in Greenwich, Connecticut.

The objective of the remediation is to address impacted soil containing pesticides and metals underlying the recreational area located northeast of the school buildings and to address historic fill containing volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, and metals underlying the athletic fields located east of the school buildings. Remediation of the recreational area will include the excavation and proper off-site disposal of impacted soil. Remediation of the athletic fields will include the excavation and proper off-site disposal of historic fill to a minimum depth of two feet below ground surface, the construction of Engineered Controls (ECs) to isolate deeper remaining historic fill, and the placement of an Environmental Use Restriction (EUR) on the property to prohibit actions that would disturb the ECs or expose remaining historic fill. The ECs consist of a minimum two-foot thick layer of clean soil and/or stone underlying the following three finished surfaces:

- Artificial turf fields located at the existing baseball, softball, and soccer fields;
- Asphalt and/or concrete pavement located at future walkways and driveways; and
- Natural grass landscaping located at existing sloped areas and wooded areas.

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If you have any questions pertaining to the planned remediation, please contact Jeff Wilcox of the CTDEEP at (860) 424-3902 or jeff.wilcox@ct.gov. Written comments on the proposed RAP and ECs may be submitted in writing to the Commissioner of the CTDEEP, c/o Jeff Wilcox,

Remediation Division, 79 Elm Street, Hartford, CT 06106 for a period of 45 days following the date of this letter.

Notes:
Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2011 National Geographic Society, i-cubed.

LANGAN
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NEW JERSEY NEW YORK VIRGINIA CALIFORNIA
PENNSYLVANIA CONNECTICUT FLORIDA

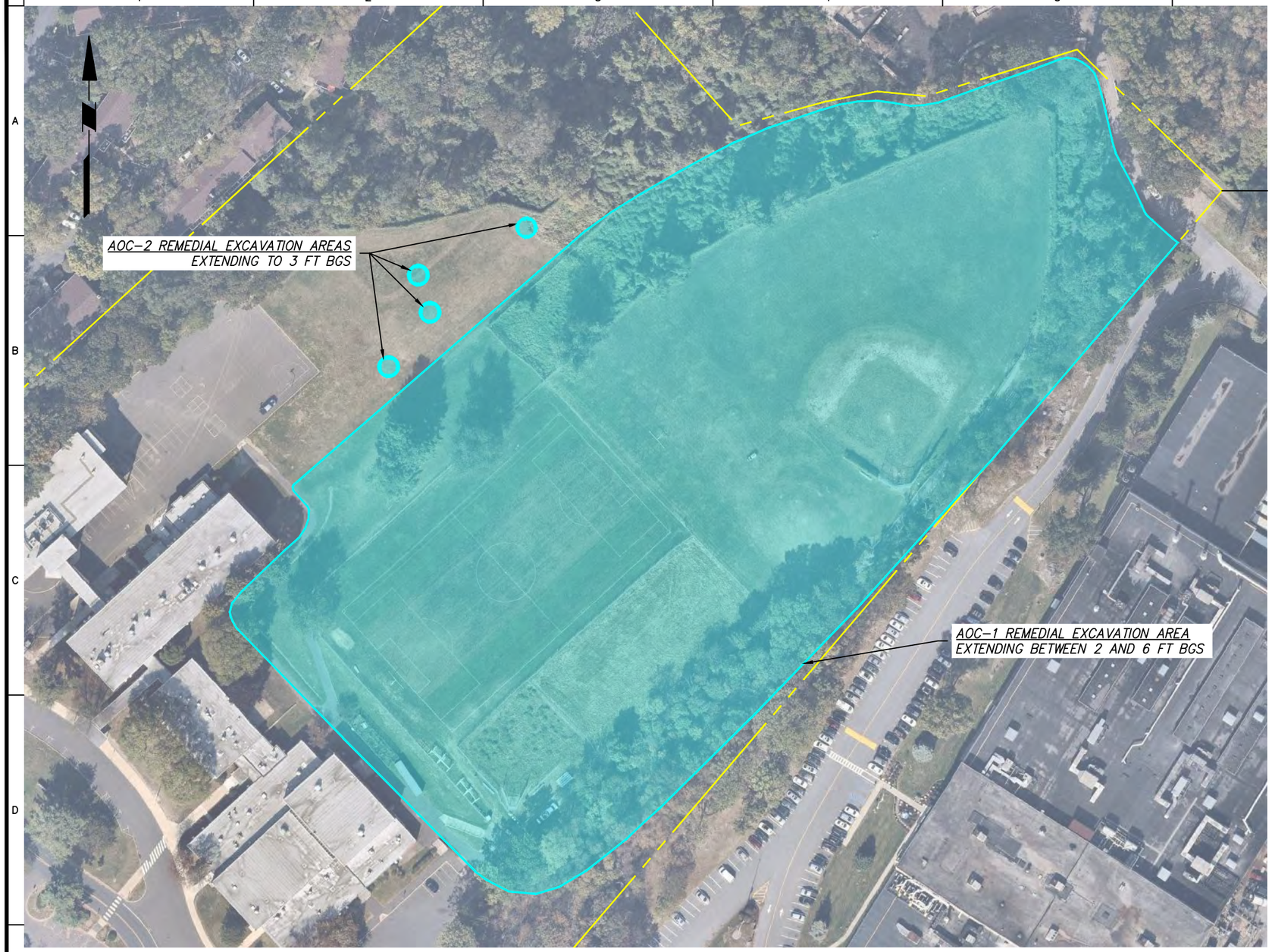
ABU DHABI ATHENS DOHA
DUBAI ISTANBUL

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SITE LOCATION MAP

Project No. 140148201	Figure 1
Date JANUARY 2022	
Scale 1" = 2,000'	
Drawn By JPH	
Submission Date JANUARY 2022	Sheet 1 of 3

Path: \\langan.com\data\NH\data2\140148201\ArcGIS\ArcMap_Documents\Figure 1 USGS Site Location Map.mxd Date: 1/11/2022 User: jhall Time: 11:13:43 PM



LEGEND

PROPERTY BOUNDARY

APPROXIMATE REMEDIAL EXCAVATION LOCATIONS

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC-1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON-WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24-INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. THE PROPOSED REMEDIAL APPROACH FOR AOC-2 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF ARSENIC AND PESTICIDE IMPACTED SOIL BENEATH THE RECREATIONAL AREA TO A DEPTH OF 3 FEET.
3. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
4. AOC = AREA OF CONCERN
5. PCB = POLYCHLORINATED BIPHENYLS
6. MG/KG = MILLIGRAMS PER KILOGRAM
7. FT = FEET
8. BGS = BELOW GROUND SURFACE
9. SF = SQUARE FEET
10. EC = ENGINEERED CONTROL

120 0 40 80 120
SCALE IN FEET

LANGAN
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New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
REMEDIAL EXCAVATION LOCATION PLAN

Project No. 140148201	Drawing No. 2
Date JUNE 2022	
Scale 1"=120'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 2 of 3

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_RAP_Plans_2022.06.dwg Date: 6/22/2022 Time: 15:22 User: jhall Style Table: Langan.stb Layout: REM EXC LOCATIONS

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE PROPOSED ARTIFICIAL TURF ENGINEERED CONTROL LOCATIONS
- APPROXIMATE PROPOSED ASPHALT AND CONCRETE ENGINEERED CONTROL LOCATIONS
- APPROXIMATE PROPSOED CLEAN SOIL CAP ENGINEERED CONTROL LOCATIONS

NOTES

1. THE PROPOSED REMEDIAL APPROACH FOR AOC–1 CONSISTS OF THE EXCAVATION AND OFFSITE DISPOSAL OF FILL/SOILS BENEATH THE ATHLETIC FIELDS AND SURROUNDING AREA TO A DEPTH OF 2 FEET, PLUS THE REMOVAL OF PCBS IN SOIL ≥10 MG/KG (REGARDLESS OF DEPTH). ANY REMAINING IMPACTED SOIL BENEATH 2 FEET BGS (WITH PCBS IN SOIL ≥1 MG/KG AND <10 MG/KG) WOULD REMAIN IN PLACE UNDER ONE OF THE FOLLOWING ENGINEERED CONTROLS (EC):
   A. ARTIFICIAL TURF EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM OF 12 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, A LAYER OF NON–WOVEN GEOTEXTILE FABRIC, A FLAT DRAIN, A MINIMUM OF 12 INCHES OF CLEAN CRUSHED STONE, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE A LAYER OF CLEAN CRUSHED FINISHING STONE FOLLOWED BY ARTIFICIAL TURF FIELD COMPONENTS TO THE FINISHED GRADE.
   B. ASPHALT AND CONCRETE EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF CRUSHED STONE FOLLOWED BY 2 TO 7 INCHES OF ASPHALT AND/OR CONCRETE TO FINISHED GRADE.
   C. CLEAN SOIL CAP EC – A MINIMUM 24–INCH THICK EC CONSISTING OF A HIGH VISIBILITY DEMARCATION LAYER ABOVE REMAINING IMPACTED SOIL, A MINIMUM 24 INCHES OF CLEAN FILL TO ACHIEVE GRADING REQUIREMENTS, AND FINISHED WITH A HIGH VISIBILITY DEMARCATION LAYER. ABOVE THE EC'S HIGH VISIBILITY DEMARCATION LAYER WILL BE AN APPROXIMATELY 6 INCH LAYER OF TOPSOIL FOLLOWED BY NATURAL GRASS TO FINISHED GRADE.
2. EC LOCATIONS ARE BASED ON PRELIMINARY DESIGN PLANS FOR THE WESTERN MIDDLE SCHOOL ATHLETIC FIELDS REDEVELOPMENT PROVIDED BY LANGAN.
3. BASEMAP TAKEN FROM NEARMAP US, INC. ON 8 FEBRUARY 2021. AERIAL PHOTOGRAPH CAPTURED ON 4 OCTOBER 2020.
4. AOC = AREA OF CONCERN
5. PCB = POLYCHLORINATED BIPHENYLS
6. MG/KG = MILLIGRAMS PER KILOGRAM
7. BGS = BELOW GROUND SURFACE
8. EC = ENGINEERED CONTROL

120 0 40 80 120
SCALE IN FEET

LANGAN
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New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
PROPOSED ENGINEERED CONTROL LOCATIONS

Project No. 140148201	Drawing No. 3
Date JUNE 2022	
Scale 1"=120'	
Drawn By JPH / Checked By RJW	
Submission Date JUNE 2022	Sheet 3 of 3

Filename: \\langan.com\data\NH\data2\140148201\Cadd Data - 140148201\2D-DesignFiles\140148201-Western Middle School_RAP_Plans_2022.06.dwg Date: 6/22/2022 Time: 15:20 User: jhall Style Table: Langan.stb Layout: EC LOCATIONS

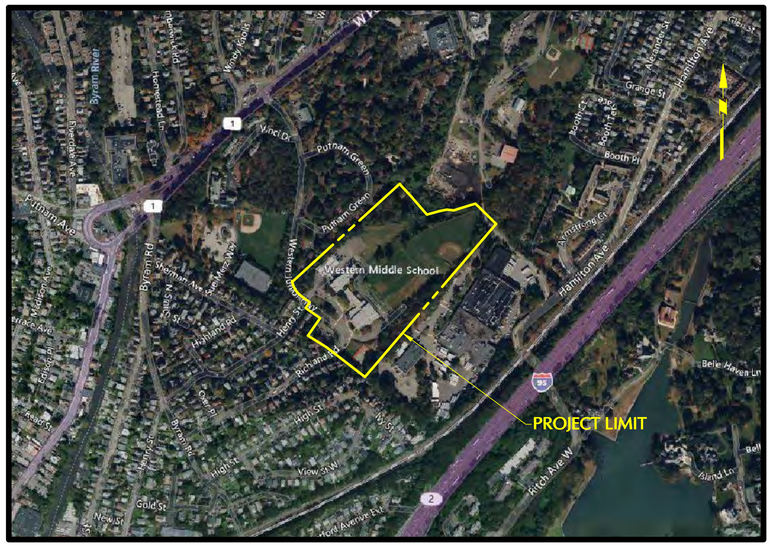
APPENDIX F

Draft Proposed Construction Plans

LANGAN

WESTERN MIDDLE SCHOOL
PROPOSED ATHLETIC FIELDS

1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT



LOCATION / VICINITY MAP
1"-500'

DRAWING LIST

NUMBER	TITLE	DATE
CS001	COVER SHEET	06/08/2022
VB101	BOUNDARY SURVEY	05/12/2021
VT102	PARTIAL TOPOGRAPHIC SURVEY	05/12/2021
CS101	SITE PLAN	06/08/2022
CS501	SITE DETAILS I	06/08/2022
CS502	SITE DETAILS II	06/08/2022
CG101	GRADING & DRAINAGE PLAN	06/08/2022
CG501	GRADING & DRAINAGE DETAILS	06/08/2022
CE101	SOIL EROSION & SEDIMENT CONTROL PLAN	06/08/2022
CE501	SOIL EROSION & SEDIMENT CONTROL DETAILS	06/08/2022

PROGRESS
PRINT
06/10/22

OWNER/ APPLICANT

TOWN OF GREENWICH
101 FIELD POINT ROAD
GREENWICH, CONNECTICUT 06830
(203)-622-7736

SURVEY/ SITE/CIVIL ENGINEER/
LANDSCAPE ARCHITECT

LANGAN CT, INC.
555 LONG WHARF DRIVE
NEW HAVEN, CONNECTICUT 06511
(203) 562-5771

RELEASE DATES

DATE	DESCRIPTION
TBD	INLAND WETLANDS & WATERCOURSES SUBMISSION

LANGAN

NOTES

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
   a. THIS SURVEY IS A PROPERTY SURVEY CONFORMING TO A HORIZONTAL ACCURACY OF A-2 AND A PARTIAL TOPOGRAPHIC SURVEY CONFORMING TO A T-2 ACCURACY. THE BOUNDARY DETERMINATION IS A RESURVEY. THE PURPOSE OF THIS SURVEY IS TO PROVIDE A BOUNDARY OPINION AND DEPICT SITE FEATURES.

2. THIS SURVEY IS BASED UPON EXISTING PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, DEED INFORMATION AND THE FOLLOWING REFERENCES:

   A. MAP TITLED "MAP OF BYRAM CREST PARK BELONGING TO TIMOTHY LOUGHLIN SITUATE IN THE TOWN OF GREENWICH, CONNECTICUT", SCALE: 1"=60', DATED: AUGUST, 1910, BY: S.E. MINOR. RECORDED IN GREENWICH LAND RECORDS AS MAP #457.

   B. MAP TITLED "MAP OF HIGHLAND PARK EXTENSION IN THE TOWN OF GREENWICH, CONNECTICUT, THE PROPERTY OF SEAMAN AND HENILECKY", SCALE: 1"=40', DATED: JANUARY 21, 1925, BY: F.S. ODELL ENGINEERING CORP., RECORDED IN GREENWICH LAND RECORDS AS MAP #1002.

   C. MAP TITLED "PROPERTY OF TOWN OF GREENWICH, GREENWICH, CONNECTICUT", SCALE: 1"=100', DATED: MARCH 9, 1959, REVISED TO ARPIL 24, 1959, BY: S.E. MINOR & CO., INC., RECORDED IN GREENWICH LAND RECORDS AS MAP #4027.

   D. MAP TITLED "SURVEY AND UNIT NUMBERING AND PARKING PLAN OF "SIXTY-SIX RICHLAND ROAD CONDOMINIUM" IN GREENWICH, CONNECTICUT, PREPARED FOR BYRAM HEIGHTS DEVELOPMENT CORPORATION", SCALE: 1"=10', DATED: APRIL 26, 1986, BY: ROCCO V. D'ANDREA, INC. RECORDED IN GREENWICH LAND RECORDS AS MAP #6359.

   E. MAP TITLED "MAP SHOWING SPLIT LOT FOR SYLVIA B. ELROD, GREENWICH, CONNECTICUT", SCALE: 1"=20', DATED: FEBRUARY 6, 1998, BY: S.E. MINOR & CO., INC., RECORDED IN GREENWICH LAND RECORDS AS MAP #7295.

   F. MAP TITLED "MAP SHOWING SUBDIVISION OF PROPERTY IN GREENWICH, CONNECTICUT, PREPARED FOR MOUNTAINVIEW GROUP, LLC", SCALE: 1"=20', DATED: AUGUST 16, 1999, BY: ROCCO V. D'ANDREA, INC., RECORDED IN GREENWICH LAND RECORDS AS MAP #7398.

3. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO CONNECTICUT STATE PLANE COORDINATE SYSTEM NAD 83 (EPOCH 2011). POSITION WAS DETERMINED BY GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) AS PROVIDED BY HXGN SMARTNET CONTINUOUSLY OPERATED REFERENCE STATIONS (CORS).

4. ELEVATIONS SHOWN ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 12B) AS DETERMINED BY GNSS

5. PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY LANGAN CT, INC. FIELD WORK COMPLETED DURING THE MONTH OF APRIL 2021.

6. AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM MAP ENTITLED "FAIRFIELD COUNTY, CONNECTICUT PANEL 494 OF 626, MAP NUMBER 09001C0494G, EFFECTIVE DATE JULY 8, 2013" THE PROJECT AREA IS IN ZONE X (UNSHADED).

7. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.

8. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS.

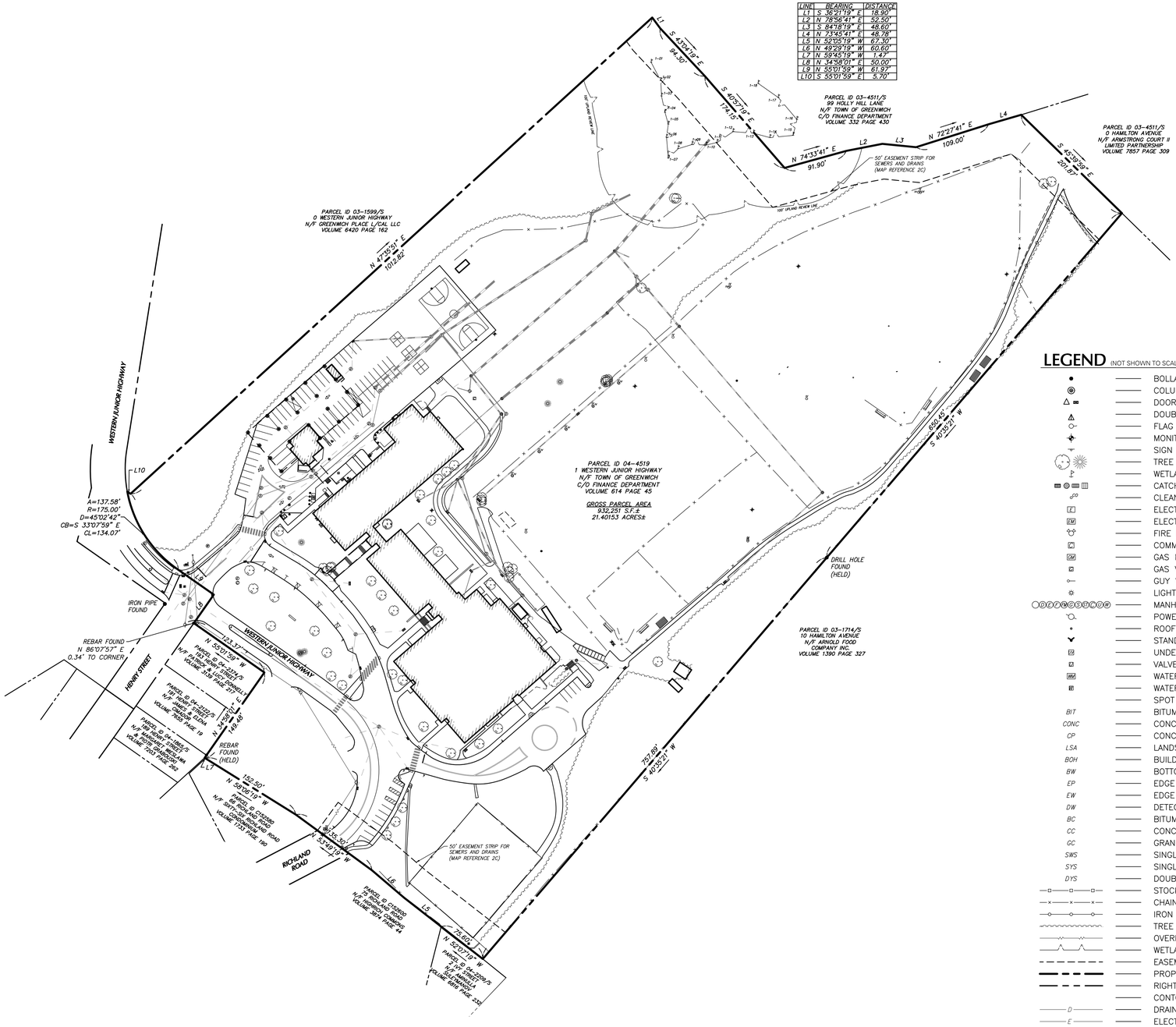
9. UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.

10. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.

11. WETLANDS WERE DELINEATED BY ALL-POINTS TECHNOLOGY IN AUGUST OF 2021.

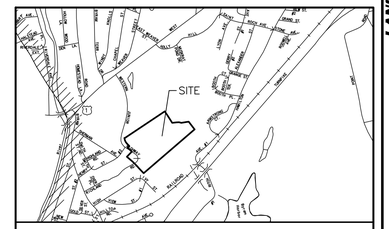
12. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.

13. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.



80 0 40 80
SCALE: 1 INCH = 80 FEET

LINE	BEARING	DISTANCE
L1	S 36°21'19" E	18.90'
L2	N 78°56'41" E	52.50'
L3	S 84°18'19" E	48.60'
L4	N 73°45'41" E	48.78'
L5	N 52°05'19" W	67.30'
L6	N 49°29'19" W	60.60'
L7	N 59°45'19" W	1.47'
L8	N 34°58'01" E	50.00'
L9	N 55°01'59" W	61.97'
L10	S 55°01'59" E	5.70'



PROJECT LOCATION MAP

SCALE: 1"=1500'

SOURCE:
CONNECTICUT DEPARTMENT OF TRANSPORTATION

CT NAD 83

LEGEND (NOT SHOWN TO SCALE)

- BOLLARD
- COLUMN
- DOOR
- DOUBLE DOOR
- FLAG POLE
- MONITORING WELL
- SIGN
- TREE
- WETLAND FLAG
- CATCH BASIN
- CLEANOUT
- ELECTRIC BOX
- ELECTRIC METER
- FIRE HYDRANT
- COMMUNICATION BOX
- GAS METER
- GAS VALVE
- GUY WIRE
- LIGHT POLE
- MANHOLE (TYPE AS LABELED)
- POWER POLE
- ROOF DRAIN
- STANDPIPE
- UNDERGROUND VAULT
- VALVE UNKNOWN
- WATER METER
- WATER VALVE
- SPOT ELEVATION
- BIT — BITUMINOUS
- CONC — CONCRETE
- CP — CONCRETE PAD
- LSA — LANDSCAPED AREA
- BOH — BUILDING OVERHANG
- BW — BOTTOM OF WALL
- EP — EDGE OF PAVEMENT
- EW — EDGE OF WALK
- DW — DETECTABLE WARNING
- BC — BITUMINOUS CURB
- CC — CONCRETE CURB
- GC — GRANITE CURB
- SWS — SINGLE WHITE STRIPE
- SYS — SINGLE YELLOW STRIPE
- DYS — DOUBLE YELLOW STRIPE
- STOCKADE FENCE
- CHAINLINK FENCE
- IRON FENCE
- TREE LINE
- OVERHEAD WIRE
- WETLAND LINE
- EASEMENT LINE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CONTOUR LINE
- D — DRAINAGE MARK OUT LINE
- E — ELECTRIC MARK OUT LINE
- C — COMMUNICATION MARK OUT LINE
- G — GAS MARK OUT LINE
- S — SANITARY SEWER MARK OUT LINE
- W — WATER MARK OUT LINE
- UNK — UNKNOWN MARK OUT LINE
- R* — REFERENCE UTILITY LINE (TYPE AS NOTED) - PLOTTED FROM EXISTING MAPPING

STATE OF CONNECTICUT
ANDREW G. IVES
NO. 70286
LICENSED
LAND SURVEYOR

Date	Description	No.
REVISIONS		

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

ANDREW G. IVES — DATE SIGNED
PROFESSIONAL LAND SURVEYOR
CT STATE LIC. NO. 70286

LANGAN

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

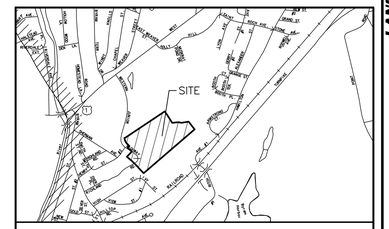
Drawing Title

BOUNDARY SURVEY

Project No.	Drawing No.
140148202	VB101
Date: MAY 12, 2021	
Drawn By: JRL	
Checked By: AGI	Sheet 1 of 2

PROJECT NO. 140148202

LANGAN



PROJECT LOCATION MAP

SCALE: 1"=1500'

SOURCE:
CONNECTICUT DEPARTMENT OF TRANSPORTATION

STATE OF CONNECTICUT
ANDREW G. IVES
NO. 70286
LICENSED
LAND SURVEYOR

Date	Description	No.
REVISIONS		

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

ANDREW G. IVES DATE SIGNED
PROFESSIONAL LAND SURVEYOR
CT STATE LIC. NO. 70286

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

Drawing Title

PARTIAL TOPOGRAPHIC SURVEY

Project No.	Drawing No.
140148202	VT102
Date: **MAY 12, 2021**	
Drawn By: **JRL**	
Checked By: **AGI**	Sheet 2 of 2

40 0 10 25 40
SCALE: 1 INCH = 40 FEET

PROJECT NO. 140148202

LANGAN

GENERAL NOTES

1. BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY LANGAN DATED 5/12/2021.
2. THE SITE IS LOCATED IN ZONE X (UNSHADED), AN AREA OUTSIDE OF MINIMAL FLOODING PER FIRM MAP 09001C0494G, EFFECTIVE DATE JULE 8, 2013.
3. ACCORDING TO THE TOWN OF GREENWICH GIS,THE SITE DOES NOT CONTAIN ANY REGULATED WETLANDS OR WATERCOURSES.

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
BUILDING LINE		
CURB LINE		
SAWCUT LINE		
CHAIN LINK FENCE		
SYNTHETIC TURF		

SIGN LEGEND

RESERVED PARKING — PERMIT REQUIRED — VIOLATORS WILL BE FINED MIN. $250 — VAN ACCESSIBLE — 31-0629, 31-0648 — (A)

RESERVED PARKING — PERMIT REQUIRED — VIOLATORS WILL BE FINED MIN. $250 — 31-0629 — (B)

APPROXIMATE LIMIT OF EXCAVATION. COORDINATE WITH ENVIRONMENTAL WORK.

LANDSCAPED AREA (TYP.)

100' UPLAND REVIEW LINE

50' EASEMENT STRIP FOR SEWERS AND DRAINS (MAP REFERENCE 2C)

16' SWING GATE

4' CHAIN LINK FENCE

END OF ATHLETIC NETTING

END OF 6' CLF START OF 4' CLF

4' CHAIN LINK FENCE WITH 20' ATHLETIC NETTING

6' CHAIN LINK FENCE WITH SAFETY CAP

24' ALUMINUM BENCH

FLUSH CONCRETE CURB (TYP.)

BITUMINOUS CONCRETE WALK

BITUMINOUS CONCRETE PAVEMENT

4' CHAIN LINK FENCE WITH 20' ATHLETIC NETTING

END OF ATHLETIC NETTING

4' CHAIN LINK FENCE

CHAIN LINK FENCE BACKSTOP WITH 30' ATHLETIC NETTING

KNEE WALL W/ 4' FENCE

3' WIDE ACCESS GATE

8' CHAIN LINK FENCE

SYNTHETIC TURF

BITUMINOUS CONCRETE PAVEMENT

10' SWING GATE

8' (TYP.)

LIMIT OF 15' X 8.5' CONCRETE BLEACHER PAD

4 ROW STEEL BLEACHER (15' LONG, 7' WIDE)

SAWCUT (TYP.)

CHAIN LINK FENCE BACKSTOP WITH 30' ATHLETIC NETTING

6' X 30' PRECAST CONCRETE DUGOUT MANUFACTURED BY EASI-SET BUILDINGS (OR APPROVED EQUAL) (TYP.)

FIELD LIGHTING FIXTURE FOUNDATION (TYP.)

FOULPOLE (TYP.)

SCALE: 1 INCH = 40 FEET

Date	Description	No.

REVISIONS

PROGRESS PRINT 06/10/22

LANGAN

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

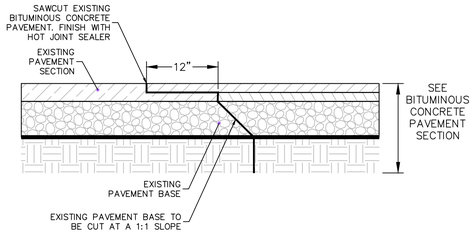
GREENWICH CONNECTICUT

Drawing Title

SITE PLAN

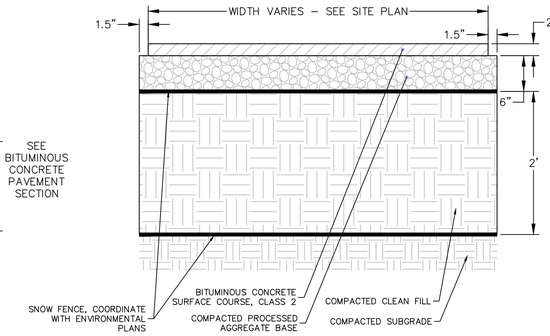
Project No.	Drawing No.
140148202	CS101
Date: 6/8/2022	
Drawn By: BTW	
Checked By: BP	Sheet 2 of 8

PROJECT NO. 140148202



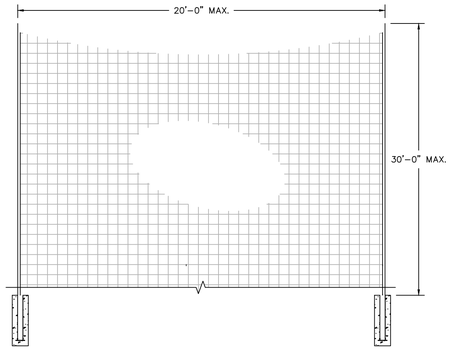
NOTES:
1. CONTRACTOR TO INSTALL TACK COAT ON ALL BUTT EDGES OF EXISTING PAVEMENT

1 SAW CUT PAVEMENT SECTION
N.T.S



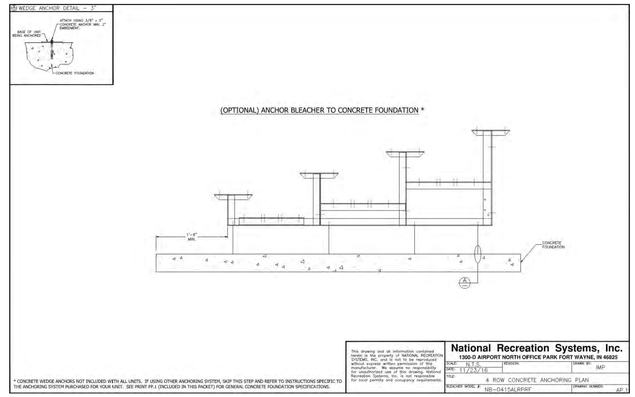
NOTES:
1. PROVIDE BITUMINOUS CONCRETE SIDEWALK AS INDICATED ON THE SITE PLAN.
2. BITUMINOUS CONCRETE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 4.06, LATEST REVISION
3. PROCESSED AGGREGATE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 3.04, LATEST REVISION

2 BITUMINOUS CONCRETE SIDEWALK
N.T.S



NOTES FOR SAFETY NETTING SYSTEM
1. ATHLETIC NETTING TO BE STORMGUARD NETTING BY SPORTSFIELD SPECIALTIES OR APPROVED EQUAL.
2. ATHLETIC NETTING TO BE PROVIDED ON TOP OF CHAINLINK FENCE.
3. ALL POSTS AND GROUND SLEEVES TO BE PROVIDED IN A BLACK POWDER COATED FINISH.
4. SYSTEM TO BE FURNISHED WITH CLEAR OR BLACK COATED CABLE RUNS ALONG THE TOP AND BOTTOM PROVIDING TENSION AND REDUCING NET SAG.
5. TO BE FURNISHED WITH A ROPE STORAGE CLEAT AND PULLEYS TO ASSIST IN RAISING AND LOWERING THE NET.
6. POSTS TO BE INSTALLED VERTICALLY AND SLIDE INTO AND OUT OF THE GROUND SLEEVES FOR EASY ASSEMBLY OR TAKEDOWN FOR OFF-SEASON STORAGE.
7. NETTING SYSTEM TO BE "STORMGUARD" BY SPORTSFIELD SPECIALTIES OR APPROVED EQUAL.

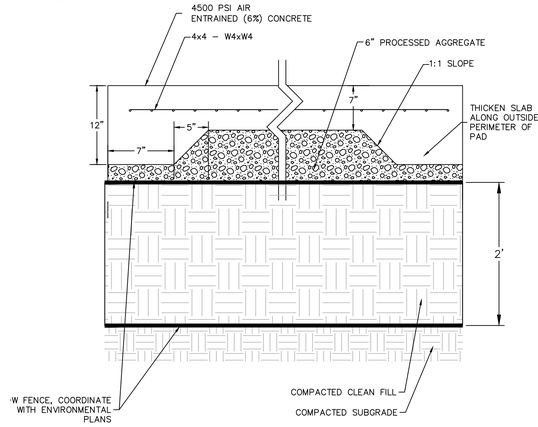
3 ATHLETIC NETTING
N.T.S



NOTES:
1. BLEACHERS TO CONFORM TO CURRENT RULES AND REGULATIONS OF THE NATIONAL FEDERATION OF STATE HIGH SCHOOLS (NFHS), BUILDING CODE, AND ADA.
2. BLEACHERS TO BE 15 FEET LONG WITH 4 ROWS OF SEATING TO PROVIDE FOR A CAPACITY OF 40 PERSONS.
3. CONTRACTOR TO PROVIDE FULL SHOP DRAWINGS CONFIRMING SPECIFIED PRODUCT AND ANCHORING SYSTEM.
4. CONTRACTOR TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
5. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED ENGINEER IN THE STATE OF CONNECTICUT.

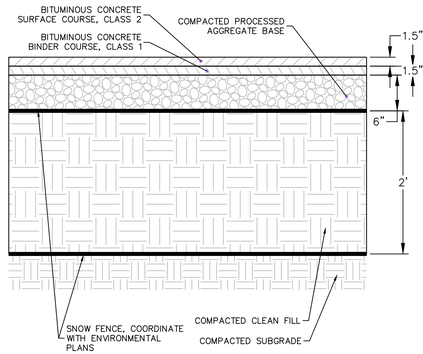
4 4 ROW BLEACHER
N.T.S

DETAIL PROVIDED BY NATIONAL RECREATION SYSTEMS, INC.



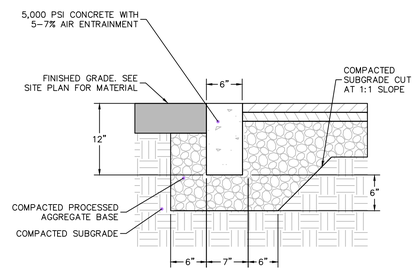
NOTES:
1. DETAIL FOR BLEACHER AND DUMPSTER AREAS.
2. PROCESSED AGGREGATE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 3.04, LATEST REVISION.

5 CONCRETE PAD FOR BLEACHERS
N.T.S



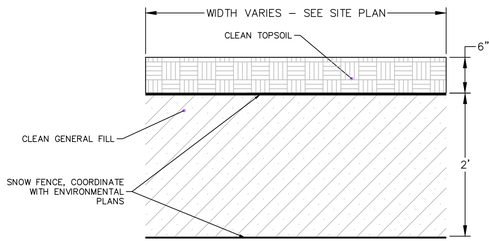
NOTES:
1. PROVIDE BITUMINOUS CONCRETE PAVEMENT AS INDICATED ON THE SITE PLAN.
2. BITUMINOUS CONCRETE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 4.06, LATEST REVISION
3. PROCESSED AGGREGATE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 3.04, LATEST REVISION

6 BITUMINOUS CONCRETE PAVEMENT SECTION
N.T.S



NOTES:
1. ALL RADII TO BE SET IN 12" OF CLASS "A" CONCRETE. NOT REQUIRED ON STRAIGHT SECTIONS OF CURBING. STRAIGHT SECTIONS OF CURBING SHALL BE SET IN PROCESSED AGGREGATE BASE.
2. JOINTS TO BE SET IN CONCRETE AND GROUTED.

7 FLUSH CONCRETE CURB
N.T.S



8 LANDSCAPED AREAS
N.T.S

Date	Description	No.
REVISIONS		

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Project

WESTERN MIDDLE SCHOOL

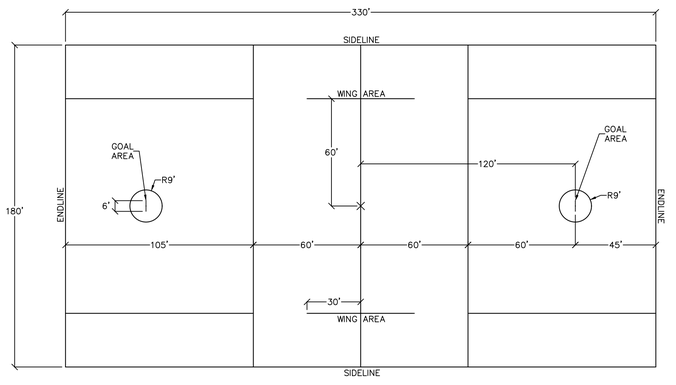
1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

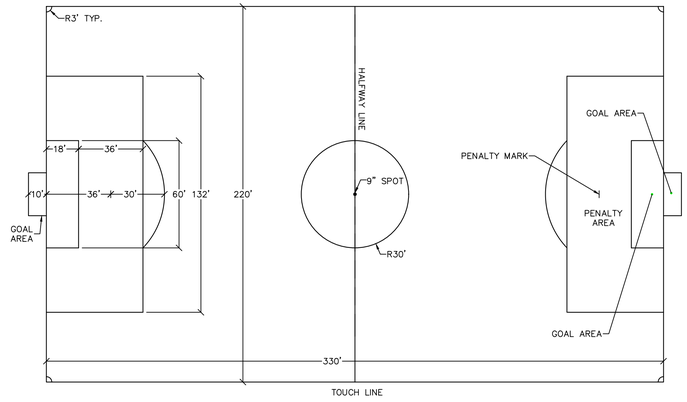
Drawing Title

SITE DETAILS I

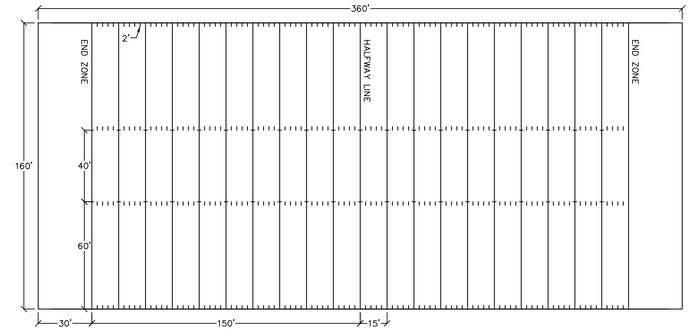
Project No.	Drawing No.
140148202	CS501
Date: 6/8/2022	
Drawn By: BTW	
Checked By: BP	Sheet 3 of 8



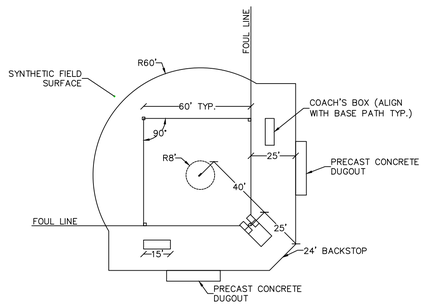
1 LACROSSE FIELD LAYOUT
N.T.S



2 SOCCER FIELD LAYOUT
N.T.S

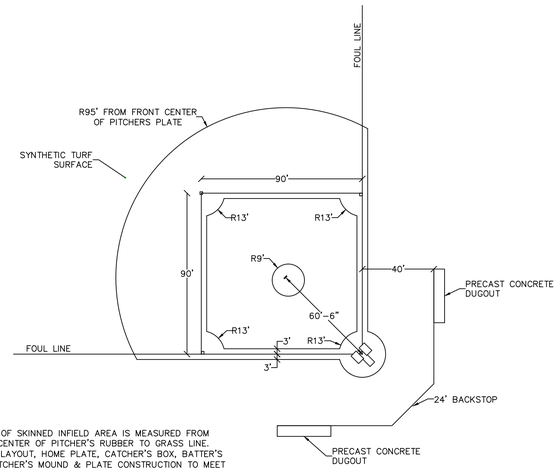


3 FOOTBALL FIELD LAYOUT
N.T.S



NOTES:
1. RADIUS OF SKINNED INFIELD AREA IS MEASURED FROM FRONT CENTER OF PITCHER'S RUBBER TO GRASS LINE.
2. INFIELD LAYOUT, HOME PLATE, CATCHER'S BOX, BATTER'S BOX, PITCHER'S MOUND & PLATE CONSTRUCTION TO MEET NFHS REQUIREMENTS.
3. ALL CHALK LINES (FOUL LINES, ETC.) TO BE 2 ½" WIDE.

4 SOFTBALL INFIELD LAYOUT
N.T.S



NOTES:
1. RADIUS OF SKINNED INFIELD AREA IS MEASURED FROM FRONT CENTER OF PITCHER'S RUBBER TO GRASS LINE.
2. INFIELD LAYOUT, HOME PLATE, CATCHER'S BOX, BATTER'S BOX, PITCHER'S MOUND & PLATE CONSTRUCTION TO MEET NFHS REQUIREMENTS.
3. ALL CHALK LINES (FOUL LINES, ETC.) TO BE 2 ½" WIDE.

5 BASEBALL INFIELD LAYOUT
N.T.S

Date	Description	No.

REVISIONS

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

Drawing Title

SITE DETAILS II

Project No.	Drawing No.
140148202	CS502
Date: 6/8/2022	
Drawn By: BTW	
Checked By: BP	Sheet 4 of 8

PROJECT NO. 140148202

GENERAL NOTES

1. BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY LANGAN DATED 5/12/2021.
2. THE SITE IS LOCATED IN ZONE X (UNSHADED), AN AREA OUTSIDE OF MINIMAL FLOODING PER FIRM MAP 09001C0494G, EFFECTIVE DATE JULE 8, 2013.
3. ACCORDING TO THE TOWN OF GREENWICH GIS,THE SITE DOES NOT CONTAIN ANY REGULATED WETLANDS OR WATERCOURSES.

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
MINOR CONTOUR	149	149
MAJOR CONTOUR	150	150
SPOT GRADE	×150.1	×150.1
STORM LINE		
CATCH BASIN		
YARD DRAIN		
STORM MANHOLE	Ⓓ	

ex MH
GR: 57.5
INV. IN (18" SE): 55.6
ex INV. OUT (18" NW): 54.9

64 LF 18" HDPE @ 29.45%

12 LF 18" HDPE @ 0.51%

MH-100
GR: 81.3
INV. IN (12" SE): 74.5
INV. IN (18" SW): 75.4
INV. IN (18" NE): 74.9
INV. OUT: 74.5

12 LF 18" HDPE @ 0.48%

OCS-114
GR: 81.2
INV. IN (12" SW): 76.1
INV. IN (12" SE): 75.5
INV. OUT: 75.5

OCS-116
GR: 81.4
INV. IN (12" NE): 75.4
INV. IN (12" SE): 74.9
INV. OUT: 74.9

APPROXIMATE LIMIT OF EXCAVATION. COORDINATE WITH ENVIRONMENTAL WORK.

PERFORATED UNDERDRAINAGE PIPE PLACED 30 FEET ON CENTER @ 0.5% SLOPE WITH MINIMUM 12" COVER (TYP.)

12" PERFORATED HDPE PERIMETER COLLECTOR PIPE IN STONE TRENCH @ 0.5% SLOPE (TYP.)

323 LF 12" HDPE @ 0.50%

2.0' (TYP.)

-0.5%

YD-115
GR: 81.2
INV. IN (12" SW): 77.0
INV. OUT: 77.0

SLOPE TO BE LESS THAN 2% WITHIN ALL ADA ACCESSIBLE PARKING SPACES. CONTRACTOR TO FIELD VERIFY EXISTING SLOPES ARE ACCEPTABLE.

128 LF 12" HDPE @ 0.50%

YD-107
GR: 79.6
INV. OUT: 77.8

117 LF 12" HDPE @ 0.50%

YD-106
GR: 79.6
INV. IN (12" SW): 77.2
INV. OUT: 77.2

27 LF 12" HDPE @ 0.50%

MH-101
GR: 81.4
INV. IN (12" E): 76.2
INV. IN (12" SW): 76.6
INV. OUT: 76.2

YD-103
GR: 81.74
INV. IN (12" NE): 76.83
INV. OUT: 76.84

96 LF 12" HDPE @ 0.50%

YD-102
GR: 81.5
INV. IN (12" NE): 76.4
INV. OUT: 76.4

YD-105
GR: 81.47
INV. OUT: 78.05

110 LF 12" HDPE @ 0.50%

YD-104
GR: 81.4
INV. IN (12" NE): 77.5
INV. OUT: 77.5

134 LF 12" HDPE @ 0.50%

PARCEL ID 03-4511/S
99 HOLLY HILL LANE
N/F TOWN OF GREENWICH
C/O FINANCE DEPARTMENT
VOLUME 332 PAGE 430

PARCEL ID 03-1714/S
10 HAMILTON AVENUE
N/F ARNOLD FOOD
COMPANY INC.
VOLUME 1390 PAGE 3

100' WETLAND REVIEW LINE

SCALE: 1 INCH = 40 FEET

Date	Description	No.
REVISIONS		

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

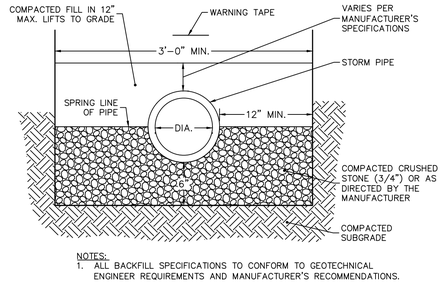
GREENWICH CONNECTICUT

Drawing Title

GRADING & DRAINAGE PLAN

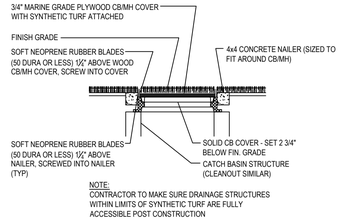
Project No. 140148202	Drawing No. CG101
Date 6/8/2022	
Drawn By BTW	
Checked By BP	Sheet 5 of 8

PROJECT NO. 140148202



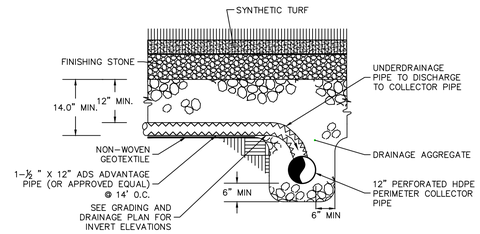
NOTES:
1. ALL BACKFILL SPECIFICATIONS TO CONFORM TO GEOTECHNICAL ENGINEER REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.

1 STORM PIPE BEDDING
N.T.S

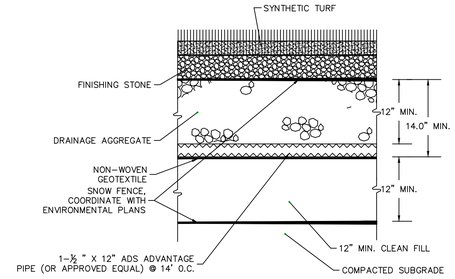


NOTE:
CONTRACTOR TO MAKE SURE DRAINAGE STRUCTURES WITHIN LIMITS OF SYNTHETIC TURF ARE FULLY ACCESSIBLE POST CONSTRUCTION

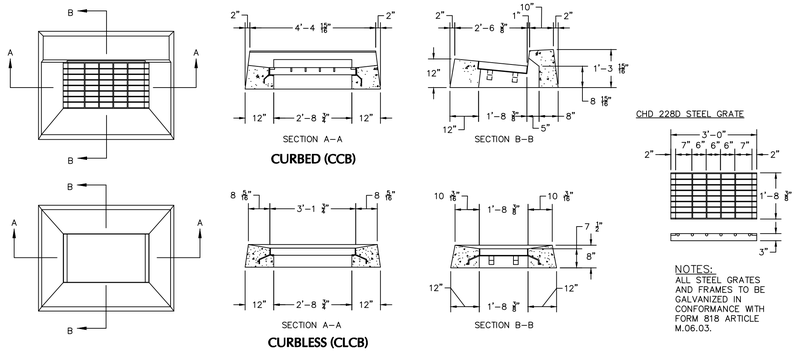
2 MANHOLE COVER AT SYNTHETIC TURF
N.T.S



3 COLLECTOR PIPE
N.T.S

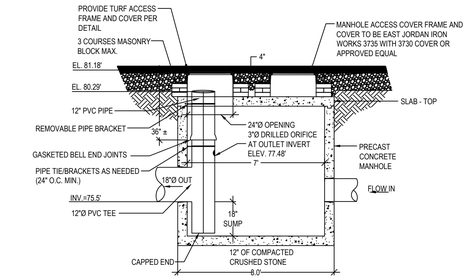


4 PERFORATED UNDERDRAIN
N.T.S

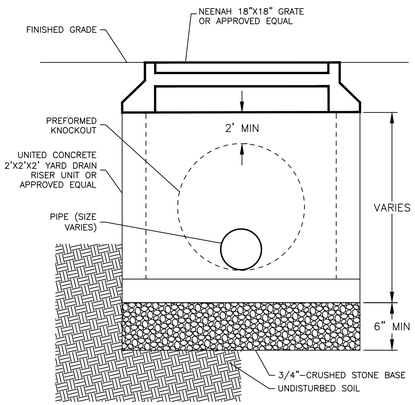


NOTES:
ALL STEEL GRATES AND FRAMES TO BE GALVANIZED IN CONFORMANCE WITH FORM 818 ARTICLE M.06.03.

3 CATCH BASIN TOP
N.T.S

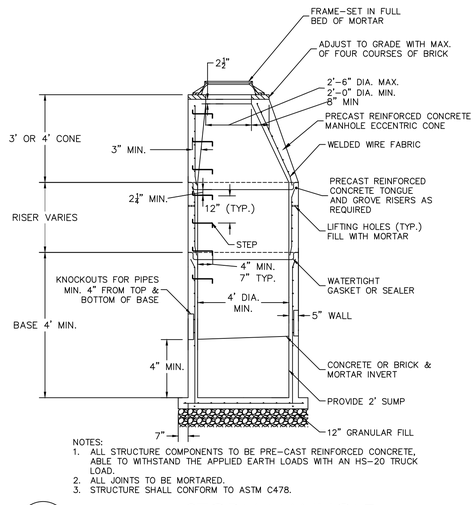


6 OUTLET CONTROL STRUCTURE (OCS-114)



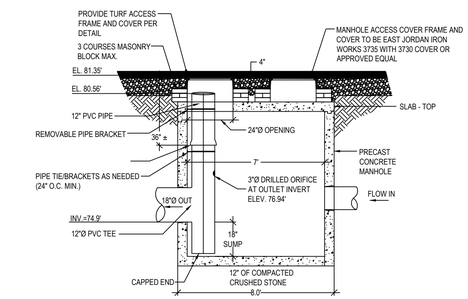
NOTES:
1. GRATES SHALL BE ROUND IN LAWN/FIELD AREAS AND SQUARE IN HARDSCAPE AREAS.
2. NEENAH ADA COMPLIANT TYPE 'Q' GRATES OR APPROVED EQUAL (MAXIMUM SLOT OPENING 1/2" MAX.) SHALL BE USED IN ALL ADA ACCESSIBLE AREAS AND WHERE SPECIFIED. CONTRACTOR TO CONFIRM WHETHER OR NOT A GRATE IS LOCATED WITHIN AN ACCESSIBLE ROUTE.
3. GRATES SHALL BE CAPABLE OF H20 LOADING.

7 YARD DRAIN
N.T.S



NOTES:
1. ALL STRUCTURE COMPONENTS TO BE PRE-CAST REINFORCED CONCRETE, ABLE TO WITHSTAND THE APPLIED EARTH LOADS WITH AN HS-20 TRUCK LOAD.
2. ALL JOINTS TO BE MORTARED.
3. STRUCTURE SHALL CONFORM TO ASTM C478.

8 STORM MANHOLE
N.T.S



9 OUTLET CONTROL STRUCTURE (OCS-116)

No.	Description	Date
	REVISIONS	

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
GRADING & DRAINAGE DETAILS

Project No.	Drawing No.
140148202	CG501
Date: 6/8/2022	
Drawn By: BTW	
Checked By: BP	Sheet 6 of 8

PROJECT NO. 140148202

GENERAL NOTES

1. BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY LANGAN DATED 5/12/2021.
2. THE SITE IS LOCATED IN ZONE X (UNSHADED), AN AREA OUTSIDE OF MINIMAL FLOODING PER FIRM MAP 09001C0494G, EFFECTIVE DATE JULE 8, 2013.
3. ACCORDING TO THE TOWN OF GREENWICH GIS,THE SITE DOES NOT CONTAIN ANY REGULATED WETLANDS OR WATERCOURSES.

LEGEND

	PROPOSED
PROPERTY LINE	
LIMIT OF DISTURBANCE	
SILT FENCE	
EXISTING INLET PROTECTION	
PROPOSED INLET PROTECTION	
CONSTRUCTION ENTRANCE	
TEMPORARY STOCKPILE AREA	

SILT FENCE (TYP.)

EROSION BLANKET ON ALL SLOPES 3:1 OR STEEPER (TYP.)

APPROXIMATELY LIMIT OF EXCAVATION. COORDINATE WITH ENVIRONMENTAL WORK.

HAY BALES (TYP.)

LIMIT OF DISTURBANCE =9.52 AC

TEMPORARY STOCKPILE

TEMPORARY STOCKPILE

CONSTRUCTION ENTRANCE (TYP.)

EXISTING INLET PROTECTION (TYP.)

PROPOSED INLET PROTECTION (TYP.)

SCALE: 1 INCH = 40 FEET

Date	Description	No.
REVISIONS		

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

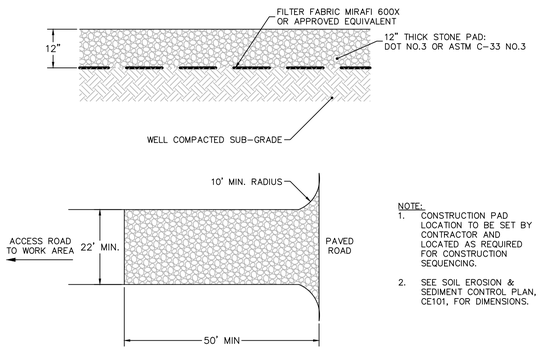
Drawing Title

SOIL EROSION & SEDIMENT CONTROL PLAN

Project No.	Drawing No.
140148202	CE101
Date: 6/8/2022	
Drawn By: BTW	
Checked By: BP	Sheet 7 of 8

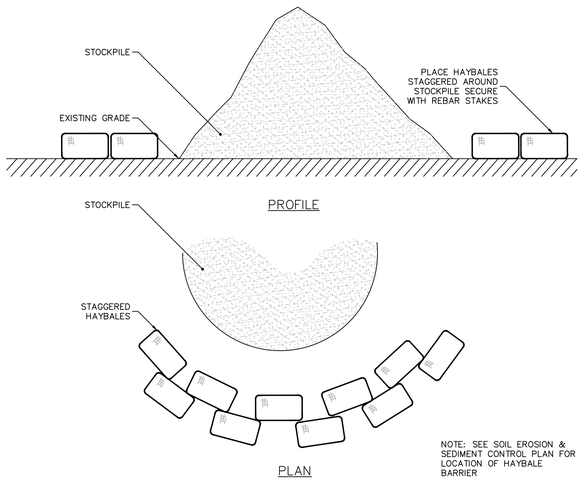
PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CADD2\SheetFiles\Civil\140148202-CE101-0101.dwg Date: 6/10/2022 Time: 11:51 User: eperez Style Table: Langan.stb Layout: CE101



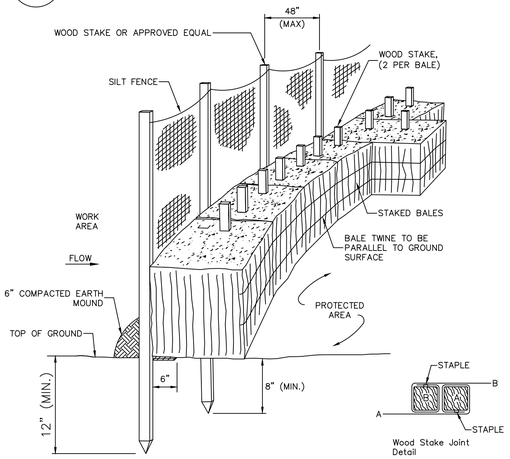
NOTE:
1. CONSTRUCTION PAD LOCATION TO BE SET BY CONTRACTOR AND LOCATED AS REQUIRED FOR CONSTRUCTION SEQUENCING.
2. SEE SOIL EROSION & SEDIMENT CONTROL PLAN, CE101, FOR DIMENSIONS.

1 CONSTRUCTION ENTRANCE
N.T.S



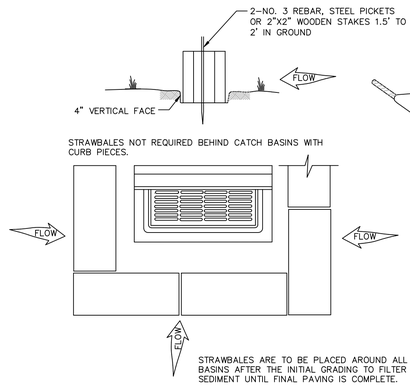
NOTE: SEE SOIL EROSION & SEDIMENT CONTROL PLAN FOR LOCATION OF HAYBALE BARRIER

4 TEMPORARY STOCKPILE
N.T.S

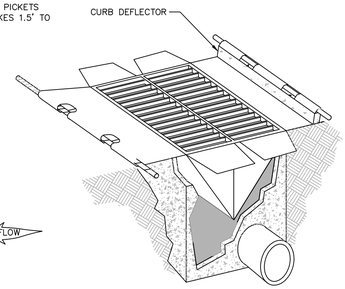


6 STAKED HAY BALES/SILT FENCE
N.T.S

SECURE "SILTSACK" FILTER
(OR EQUIVALENT) TO GRATE.

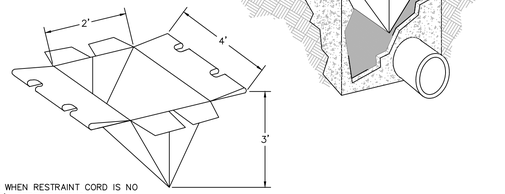


STRAWBALES ARE TO BE PLACED AROUND ALL CATCH BASINS AFTER THE INITIAL GRADING TO FILTER AND DIVERT SEDIMENT UNTIL FINAL PAVING IS COMPLETE.



TYPE B – CURB INLET

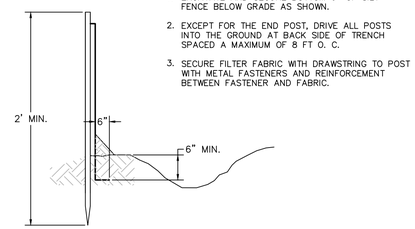
"SILTSACK"
DISTRIBUTOR:
ACS ENVIRONMENTAL
800-644-9223



NOTES:
1. CONTRACTOR IS TO CLEAN INLET FILTER WHEN RESTRAINT CORD IS NO LONGER VISIBLE AS PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR TO REMOVE FILTER JUST PRIOR TO PAVING.

2 INLET PROTECTION
N.T.S

INSTALLATION NOTES:
1. EXCAVATE AND SECURE BOTTOM 6" OF SILT FENCE BELOW GRADE AS SHOWN.
2. EXCEPT FOR THE END POST, DRIVE ALL POSTS INTO THE GROUND AT BACK SIDE OF TRENCH SPACED A MAXIMUM OF 8 FT O. C.
3. SECURE FILTER FABRIC WITH DRAWSTRING TO POST WITH METAL FASTENERS AND REINFORCEMENT BETWEEN FASTENER AND FABRIC.



3 SILT FENCE
N.T.S

NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS
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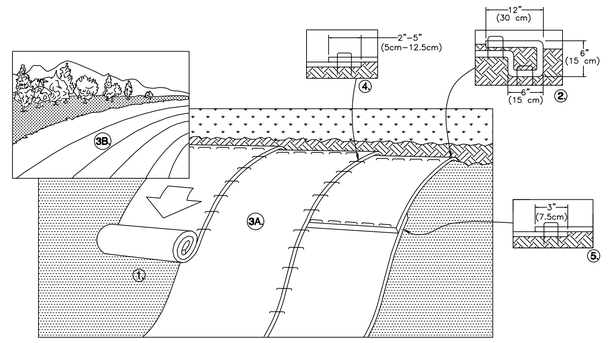
EVANSVILLE, IN 47725
800-772-2040
www.nagreen.com

BIONET SC150BN DOUBLE NET STRAW BLANKET – BIODEGRADABLE (OR APPROVED EQUAL)

SLOPE INSTALLATION

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM® , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.



NOTE:
CONTRACTOR TO PROVIDE EROSION CONTROL BLANKET ON ALL SLOPES 3:1 OR STEEPER.

5 SLOPE STABILIZATION (SLOPES ≥3H:1V)
N.T.S

Date	Description	No.
REVISIONS		

PROGRESS PRINT 06/10/22

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555 Long Wharf Drive
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T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SOIL EROSION & SEDIMENT CONTROL DETAILS

Project No.	Drawing No.
140148202	CE501
Date: 6/8/2022	
Drawn By: BTW	
Checked By: BP	Sheet 8 of 8

LANGAN
PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Civil\140148202-CE501-0101.dwg Date: 6/10/2022 Time: 11:51 User: eperez Style Table: Langan.stb Layout: CE501

APPENDIX G

Stormwater Pollution Prevention Plan

LANGAN

STORMWATER POLLUTION CONTROL PLAN

for

Western Middle School
Greenwich, Connecticut

Prepared For:

Greenwich Public Schools
290 Greenwich Avenue
Greenwich, CT 06830

Prepared By:

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LANGAN

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1.0 INTRODUCTION

This Stormwater Pollution Control Plan (SWPCP) has been prepared in support of the Connecticut Department of Energy and Environmental Protection *General Permit for Stormwater and Dewatering Wastewaters from Construction Activities* (CTDEEP General Permit) for Western Middle School, Greenwich, Connecticut. The development includes the remediation/removal of impacted fill material beneath the existing athletic fields and the construction of new synthetic turf athletic fields with associated site improvements including grading, stormwater, and landscaping. Site work is anticipated to begin during spring of 2023. The SWPCP is prepared pursuant to the requirements of Section 5(b) of the CT DEEP General Permit effective December 31, 2020. This General Permit was issued by the CT DEEP pursuant to Section 22a-430b of the Connecticut General Statutes, as amended by Public Act 91-263. See Appendix A for a complete copy of the CTDEEP General Permit. A location map showing the general boundaries of the construction activity is attached as Figure 1.

2.0 SITE DESCRIPTION (SECTION 5(b)(1)(B)(ii) OF GENERAL PERMIT)

The proposed synthetic turf athletic fields are located at 1 Western Junior Highway in Greenwich, Connecticut; see figure 1. The site is bounded to the north-west by residential apartment buildings, on the north-east by Greenwich Waste Disposal and on the south-east by Bimbo Bakeries. The site is currently occupied by natural grass athletic fields and wooded areas. Site grades in the north-western portion of the site area generally flat and slope down to the west from approximately 60 to 57. A 3:1 slope separates the northwestern portion of the site from the existing athletic fields to the southeast. Grades rise from approximately 60 to 78. Site grades are mostly flat within the existing athletic fields with grades ranging from an elevation of approximately 78 to 85. There is an isolated mound within the existing athletic fields, along the south-eastern border, with a high point of approximately 94. Site grades within the existing athletic fields slope down in the north-west direction to approximately 55, in the north-east direction to approximately 57, in the south-east direction to approximately 80 and in the south-west direction to approximately 71. Grades are based off of North American Vertical Datum of 1988 (NAVD88) (Geoid 12B) found in the survey prepared by Langan dated May 12th, 2021.

2.1 Construction Activity (Section 5(b)(1)(B)(ii)(a) of General Permit)

The project includes the remediation/removal of impacted fill material beneath the existing athletic fields and the construction of new synthetic turf athletic fields with associated site, grading, stormwater, and landscaping improvements. Access to and from the site will be maintained through the southern driveway

along Western Junior Highway and through the pedestrian pathway along Muskrat Pond Drive.

2.2 Area of Site and Area of Disturbance (Section 5(b)(1)(B)(ii)(b) of General Permit)

The total area of land disturbance associated with this development is ±9.5 acres.

2.3 Proposed Stormwater Runoff (Section 5(b)(1)(B)(ii)(c) of General Permit)

A complete narrative, calculations and figures describing the stormwater management is contained in the memo entitled Stormwater Management Analysis prepared by Langan, dated 17 June 2022. A full copy of this can be found in Appendix G.

Stormwater quality measures/improvements include landscaped areas, catch basins with sumps, outlet control structures, and drainage aggregate to be utilized as storage beneath the turf athletic fields.

2.4 Receiving Waters (Section 5(b)(1)(B)(ii)(d) of General Permit)

The site is located in the Southwest Shoreline regional watershed basin. Stormwater runoff from the site is either collected in on-site drainage structures or flows overland to the northern wetland or surround properties.

2.5 Area of Wetlands on-site (Section 5(b)(1)(B)(ii)(e) of General Permit)

There are wetlands located to the north of the property. No wetland disturbances are proposed.

3.0 CONSTRUCTION SEQUENCING (SECTION 5(b)(1)(B)(iii) OF GENERAL PERMIT)

3.1 Sequence and Estimated Timetable of Major Activities

1. Construction begins – Spring 2023.
2. Hold a preconstruction meeting with all appropriate town departments prior to construction commencement and in accordance with all approvals.
3. Placed crushed stone stabilized construction entrance and set up construction trailers.
4. Install inlet protection and sediment control measures at the existing drainage inlets.
5. Establish all other remaining stormwater runoff control measures.

6. Remdiate/remove impacted fill material beneath the existing fields per the project Remedial Action Plan (RAP).
7. Remove all surficial features per demolition plan.
8. Clear, grub, strip, and stockpile topsoil from construction area.
9. Temporarily stabilize area of excavation and any disturbed areas.
10. Install synthetic turf athletic surfacing in accordance with the site plan.
11. Install storm drainage system, including pipe and manholes. Provide inlet protection for all new structures. Ensure outlet locations have adequate outlet protection and are stable.
12. Install concrete curbing.
13. Install binder course of pavement.
14. Install wearing course of pavement.
15. Install traffic control signage.
16. Place landscape trees and shrubs as noted on the landscape plan.
17. Clean and flush the storm drainage system.
18. Upon turf establishment, remove all soil erosion and sediment control measures.
19. Obtain all required sign-offs from all appropriate city departments.
20. End construction – Winter 2024.

4.0 CONTROL MEASURES (SECTION 5(B)(1)(B)(iv) OF GENERAL PERMIT)

The stabilization practices, structural practices and maintenance procedures are described on the Grading & Drainage Plan, the Soil Erosion & Sediment Control Plan, and in the Soil Erosion & Sediment Control Details. The locations of these controls are shown on the above referenced plans. All erosion and sediment control measures will be designed and constructed in accordance with the Guidelines for Soil Erosion and Sediment Control published by the Connecticut Council on Soil and Water Conservation (the "Guidelines").

4.1 Sediment removal controls (Section 5(B)(1)(B)(iv)(a) of General Permit)

Soil erosion and sediment control measures will be put in place to mitigate runoff from the site. Details of these measures can be found on the included plans.

4.2 Velocity Dissipation (Section 5(B)(1)(B)(iv)(b) of General Permit)

Both drainage aggregate storage utilized for detention and outlet control structures are proposed for energy dissipation of runoff leaving the site. No new stormwater outfalls are proposed.

5.0 RUNOFF REDUCTION AND LOW IMPACT DEVELOPMENT INFORMATION (SECTION 5(b)(1)(B)(v) OF GENERAL PERMIT)

Impervious surfaces will be increased for this project; however runoff will be reduced through the use of drainage aggregate storage for underground stormwater detention with outlet control structures. In addition, silt fencing, hay bales, and inlet filters will be used. Details of these measures can be found within the included drawings (CG101, CE101).

6.0 INSPECTION (SECTION 5(b)(1)(B)(vi) OF GENERAL PERMIT)

6.1 Inspection by Qualified Personnel

All construction activities submitting a registration for this general permit shall be inspected initially for Plan implementation and then weekly for routine inspections. Plan implementation and inspections shall be conducted by designing qualified professional.

Inspectors from the DEEP and the appropriate District may inspect the site for compliance with this general permit at any time construction activities are ongoing and upon completion of construction activities to verify the final stabilization of the site and/or the installation of post-construction stormwater management measures pursuant to Section 6(*a*) of the general permit.

6.1.1 Plan Implementation Inspections

Within the first 30 days following commencement of the construction activity on the site, the permittee shall contact: (1) the appropriate District; or (2) a qualified soil erosion and sediment control professional or a qualified professional engineer to inspect the site. The site shall be inspected at least once and no more than three times, with seven or more days between inspections, during the first 90 days to confirm compliance with the general permit and proper initial implementation of all controls measures designated in the Plan for the site for each phase of construction. The following conditions shall apply:

a. For all projects not conducted by a state agency and which disturb more than one acre, the inspector shall be someone who:

    1. is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant, and

2. has no ownership interest of any kind in the project for which the registration is being submitted.

b. For projects conducted by a state agency and which disturb more than one acre, the inspector shall be someone who:

1. Is not an employee, defined by the Internal Revenue Service in the Internal Revnue Code of 1986, if the registrant, and
2. has no ownership interest of any kind in the project for which the registration is being submitted and
3. is included in the list of qualified professionals specified in Section 3(*b*)(12)(B) of the general permit.

6.1.2 Routine Inspections

The permittee shall routinely inspect the site for compliance with the general permit and the Plan for the site until a Notice of Termination has been submitted.

1. The permittee shall maintain a rain gauge on-site to document rainfall amounts. At least once a week and within 24 hours of the end of a storm that generates a discharge, a qualified inspector (provided by the permittee), as defined in the "Definitions" section (Section 2) of the general permit, shall inspect, at a minimum, the following: disturbed areas of the construction activity that have not been finally stabilized; all erosion and sedimentation control measures; all structural control measures; soil stockpile areas; washout areas and locations where vehicles enter or exit the site. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking. For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours.
2. Where sites have been temporarily stabilized, routine inspections shall occur at least weekly until final stabilization has been achieved.

3. Once all post-construction stormwater measures have been installed and final stabilization has been achieved, routine inspections shall occur once a month for a period of three months.

Inspection procedures for these routine inspections shall be addressed and implemented in the following manner. The qualified inspector(s) shall evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls implemented to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharges. In addition, during each routine inspection the site including, but not limited to, all of the areas noted in the preceding paragraph, shall be inspected for evidence of, or the potential for, pollutants discharging to waters, or entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking.

6.1.3 Post Construction Inspection

For locally exempt projects except those conducted by state agencies, once all postconstruction stormwater measures have been installed in accordance with the Section 5(b)(2)(C) of the general permit, "Post-Construction Stormwater Management", and cleaned of any construction sediment or debris, the permittee shall ensure that a qualified soil erosion and sediment control professional or a qualified professional engineer inspects the site to confirm compliance with the post-construction stormwater management requirements of the general permit. A report shall be prepared and certified in accordance with Sections 6(a) and (b) of the general permit to indicate compliance with this requirement on the Notice of Termination form.

For projects conducted by state agencies, once all post-construction stormwater measures have been installed in accordance with the Post-Construction Stormwater Management section (subsection 5(b)(2)(C)) and cleaned of any construction sediment or debris, the DOT District Engineer or his/her designee and/or DOT District Environmental Coordinator, or the designated employee of another state agency, will inspect the site to confirm compliance with the post-construction stormwater management requirements of the general permit.

6.1.4 Final Stabilization Inspection

Once the site has achieved final stabilization for at least one full growing season (April – October) in the year following the end of construction, the Permittee shall have the site inspected by a qualified inspector to confirm such stabilization is maintained. The Permittee shall indicate compliance with this requirement on the Notice of Termination form.

6.2 Reporting and Record Keeping

A report shall be prepared and retained as part of the Plan. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel making the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharges from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the permittee or his/her authorized representative in accordance with the "Certification of Documents" section of the general permit.

The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven days and incorporated into a revised Plan within ten days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

The reports specified in this section shall be provided to the Commissioner within the timeframe specified in any request by the Commissioner, and if no timeframe is specified, no later than thirty (30) days after the date of any such

request. If requested by the Commissioner, the reports shall be submitted to the Commissioner using NetDMR in the manner specified in subsection (B), below.

NetDMR Reporting The permittee shall submit all reporting of inspections, Plan updates or other reporting electronically using NetDMR, a web-based tool that allows Permittees to electronically submit stormwater reports through a secure internet connection. Unless otherwise approved in writing by the commissioner, no later than thirty (30) days after authorization under this permit the Permittee shall begin reporting electronically using NetDMR. Specific requirements regarding subscription to NetDMR and submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

1. Submittal of NetDMR Subscriber Agreement At or before the time the Permittee submits a registration for this permit, the Permittee and/or the person authorized to sign the Permittee's reports ("Signatory Authority") as described in RCSA Section 22a-430-3(b)(2) shall contact the Department at deep.netdmr@ct.gov and initiate the NetDMR subscription process for electronic submission of Stormwater Report information. Information on NetDMR is available on the Department's website at www.ct.gov/deep/netdmr. On or before the date of authorization under this permit the Permittee shall submit a signed and notarized copy of the Connecticut DEEP NetDMR Subscriber Agreement to the Department.

2. Submittal of Reports and other documents Using NetDMR Unless otherwise approved by the commissioner, on or before thirty (30) days following authorization under this permit, the Permittee and/or the Signatory Authority shall electronically submit reports and any other documents required under this permit or by request of the Commissioner to the Department using NetDMR in satisfaction of the requirements of Section 5(c)(2)(A) of this permit. Reports shall be submitted electronically to the Department no later than fifteen (15) days following the completed reporting period. NetDMR is accessed from: http://www.epa.gov/netdmr.

3. Submittal of NetDMR Opt-Out Requests If the Permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for electronically submitting reports, the commissioner may approve an alternative for the submission of reports. Any such request shall be submitted in writing to the Department for written approval on or before the Permittee's date of permit authorization. This demonstration shall be valid for twelve (12) months from the date of the Department's approval and shall thereupon expire. At such time, reports shall

be submitted electronically to the Department using NetDMR unless the Permittee submits a renewed request for an alternative and such request is approved by the Department. All requests under this provision and requests for the NetDMR subscriber form should be sent to the following address or by email at deep.netdmr@ct.gov:

Attn: NetDMR Coordinator
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

7.0 CONTRACTORS (SECTION 5(b)(1)(B)(vii) OF GENERAL PERMIT)

Contained in Appendix B is a copy of the certification statement required for all contractors and subcontractors that will perform action on this site.

7.1 Certification Statement

Copies of the certification statement have been included in Appendix B which is required for all contractors and subcontractors that will perform action on this site. This certification shall be signed by each contractor and subcontractor identified in the Plan and will include the name and title of the person providing the signature, the name, address and telephone number of the contracting firm; the address of the site; and the date of the certification.

7.2 Subdivisions

The project is not proposing a subdivision and therefore this requirement is not applicable.

8.0 IMPAIRED WATERS (SECTION 5(b)(1)(B)(viii) OF GENERAL PERMIT)

Construction activities from this project do not discharge directly into impaired waters.

9.0 STORMWATER CONTROL MEASURES (SECTION 5(b)(2) OF GENERAL PERMIT)

9.1 Erosion and Sediment Controls (Section 5(b)(2)(A) of General Permit)

The stabilization practices, structural practices and maintenance procedures are described on the Grading & Drainage Plans, the Soil Erosion & Sediment Control Plans, and in the Soil Erosion & Sediment Control Details. The location of these controls is shown on the above referenced plans. All erosion and sediment control measures are designed and will be constructed in accordance with the

Guidelines for Soil Erosion and Sediment Control published by the Connecticut Council on Soil and Water Conservation (the "Guidelines").

9.1.1 Soil Stabilization and Protection

Prior to any construction activity, soil stabilization practices including anti-tracking pads, hay bales, silt fence, and inlet protection will be installed. Anti-tracking pads will be installed to service the site in order to maintain soil stability in this high trafficked area and to prevent tracking soil onto adjacent roads. Haybales, silt fence or combination hay bale/silt fence barriers will be placed at key locations where run-off potential exists including down-gradient areas, around the perimeter of the site, and around stockpiles or stockpile areas. Two levels of barriers are required at all locations where slopes are equal to or greater than 8%. Inlet filter protection will be deployed at all existing and proposed catch basins/inlets. All disturbed areas will be temporarily stabilized where necessary and final stabilization provided as soon as practical.

9.1.2 Wetland Protection

A double row of silt fence and hay bales will be installed upgradient of all wetlands on site in accordance with the Guidelines.

9.1.3 Structural Measures

Structural practices included in the Soil Erosion & Sedimentation Control Plan that divert flows away from exposed soils, store flows and limit runoff and discharge of pollutants from the site include but are not limited to earth berms, diversion swales, and sediment basins. Earth berms, diversion swales, and sediment traps will be located as a system to divert water into the sediment trap prior to discharging towards down-gradient systems. For additional detail regarding structural practices refer the Soil Erosion & Sediment Control Plan (CE101) and the Soil Erosion & Sediment Control Details (CE501).

9.1.4 Maintenance

The contractor shall be responsible for the proper construction and stabilization, and maintenance of all temporary erosion and sediment control measures and related items, and shall also be responsible for the proper construction and stabilization of all pertinent erosion and sedimentation control measures and related items.

The contractor shall also issue a report summarizing the scope of his inspection, time, personnel used, observations and action taken for each inspection. These reports shall be retained as part of the erosion and sedimentation control plan.

Silt fence and haybales shall be inspected once every seven calendar days or after every storm event producing 0.25 inches of rainfall or greater. Any necessary repairs shall be made immediately. Accumulated sediments shall be removed as required to keep the silt fence and fiber rolls functional. Deposits shall be removed when accumulations reach one-half the above ground height of the fence. Undercutting or erosion of the toe anchor shall be replaced immediately with rock filters.

The stabilized construction entrances shall be inspected at the end of each workday. The thickness shall be constantly maintained to the specified thickness by adding additional rock. A stockpile of rock material shall be maintained on-site for this purpose. At the end of each workday, any sediment deposited on the public roadways shall be removed and returned to the construction site. Washing of the roadway with water shall not be permitted.

Inlet filters shall be inspected once a week or after each storm event with 0.25 inch of rainfall or greater, whichever comes first. Any necessary repairs shall be made immediately. Accumulated sediments shall be removed as required to keep the filter and sediment basins functional.

Inspect erosion control blankets at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.25 inch or greater for failures. Blanket failure has occurred when (1) soils and/or seed have washed away from beneath the blanket and the soil surface can be expected to continue to erode at an accelerated rate, and/or (2) the blanket has become dislodged from the soil surface or is torn.

Inspect temporary soil stockpiles daily. The side slopes of stockpiled material that is erodible should be no steeper than 2: 1. Stockpiles that are not to be used within 30 days need to be seeded and mulched immediately after formation of the stockpile.

10.0 DEWATERING WASTEWATERS (SECTION 5(b)(2)(B) OF GENERAL PERMIT)

Groundwater was encountered during an environmental investigation conducted by Langan in June 2017 and August 2017. Groundwater was observed between 7 feet below existing grade at the southwestern portion of the athletic fields and 16.5 feet below existing grade at the western portion of the recreational area. Groundwater was observed between 14 and 25 feet below existing grade at the central portion of the athletic fields and between 18.5 and 22 feet below existing grade at the eastern portion of the athletic fields. Groundwater can be expected to fluctuate with time as a result of seasonal changes, precipitation, and other conditions.

11.0 POST CONSTRUCTION STORMWATER MANAGEMENT (SECTION 5(b)(2)(C) OF GENERAL PERMIT)

11.1 Runoff Reduction and Low Impact Development Practices

Methods for runoff reduction and low impact development on site include outlet control structures and drainage aggregate storage for underground stormwater detention.

11.2 Suspended Solids and Floatables Removal

The stormwater management system has been designed to remove suspended solids and floatables in accordance with the 2004 CTDOT *Stormwater Quality Manual*. Post-construction stormwater management measures designed to remove suspended solids and floatables include the use of: catchbasin with sumps and outlet control structures. See the Stormwater Report for detailed information.

11.3 Velocity Dissipation

Measures for velocity dissipation include outlet control structures and drainage aggregate storage for underground stormwater detention. See the Stormwater Report and plans for detailed information.

12.0 OTHER CONTROLS (SECTION 5(b)(2)(D) OF GENERAL PERMIT)

12.1 Waste Disposal

Best management practices shall be implemented to minimize the discharge of litter, debris, building materials, hardened concrete waste, or similar materials to waters of the State. These materials will be placed in appropriate containers that prevent release and properly disposed of off-site or segregated and properly reused. Portable toilets containing sanitary wastes will be secured to prevent them from being tipped over. Routine inspections and good housekeeping measures will minimize the potential of a release of waste to surface water.

12.2 Washout Areas

Washout of applicators, containers, vehicles and equipment for concrete, paint and other materials shall be conducted in a designated washout area. There shall be no surface discharge of washout wastewaters from this area. Such washout shall be conducted: (1) outside of any buffers and at least 50 feet from any stream, wetland or other sensitive resource; or (2) in an entirely self-contained washout system. The permittee shall clearly flag off and designate areas to be used for washing and conduct such activities only in these areas. The permittee shall direct all washwater into a container or pit designed such that no overflows can occur during rainfall or after snowmelt.

In addition, dumping of liquid wastes in storm sewers is prohibited. The permittee shall move and dispose of hardened concrete waste consistent with practices developed for the "Waste Disposal" section (subparagraph 13.1 above). At least once per week, the permittee must inspect any containers or pits used for washout to ensure structural integrity, adequate holding capacity, and to check for leaks or overflows. If there are signs of leaks, holes or overflows in the containers or pits that could lead to a discharge, the permittee shall repair them prior to further use. For concrete washout areas, the permittee shall remove hardened concrete waste whenever the hardened concrete has accumulated to a height of half of the container or pit or as necessary to avoid overflows.

12.3 Vehicle Tracking

Off-site vehicle tracking of sediments and the generation of dust shall be minimized. Wet dust suppression shall be used, in accordance with section 22a-174-18(b) of the Connecticut General Statutes, for any construction activity that causes airborne particulates. The volume of water sprayed for controlling dust

shall be minimized so as to prevent the runoff of water. No discharge of dust control water shall contain or cause visible oil sheen, floating solids, visible discoloration, or foaming in the receiving stream.

12.4 Post-Construction

All post-construction stormwater structures shall be cleaned of construction sediment and any remaining silt fence and fiber rolls shall be removed upon stabilization of the site.

All chemical and petroleum product containers stored on the site (excluding those contained within vehicles and equipment) shall be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers shall be stored under a roofed area except for those chemicals stored in containers of 100 gallon capacity or more, in which case a roof is not required. Double-walled tanks satisfy this requirement.

13.0 PLAN AMENDMENTS AND KEEPING PLANS CURRENT

The Permittee is responsible for keeping their Plan in compliance with this general permit at all times. This may involve any or all of the following:

1. The permittee shall amend the Plan if the actions required by the Plan fail to prevent pollution or unauthorized discharges to the waters of the state, or fail to comply with any other provision of this general permit. The Plan shall also be amended whenever there is an addition of or change in contractors or subcontractors at the site, the designing qualified professional, District personnel, or a change in design, construction, operation, or maintenance at the site which has not otherwise been addressed in the Plan.

2. The permittee shall submit a new registration to the commissioner in accordance with the general permit if the amount of disturbed area increases from the amount specified in the registration approved by the Commissioner or there are changes to engineered or non-engineered construction or post-construction control measures that have the potential to increase the quantity or quantity of pollution in the site's stormwater discharges. Such new registration shall be submitted before any such increases or changes are implemented.

3. The commissioner may notify the permittee at any time that the Plan or the site does not meet one or more requirements of this general permit. Within seven (7) days of such notice, or such other time as the commissioner may allow, the permittee shall make the required changes to the Plan and perform all actions required by such revised Plan. Within 15 days of such notice, or such other time as the commissioner may allow, the permittee shall submit to the commissioner a written certification that the requested changes have been made and implemented and such other information as the commissioner requires. Any such certification or information shall be submitted in accordance with the 'Duty to Provide Information" and "Certification of Documents," Sections 5(g) and 5(h) of this general permit.

For any stormwater discharges authorized under any previous version of this general permit, the Permittee shall, excluding any provisions for which an exemption is provided for in Section 4(c)(3)(C) of the general permit, update their Plan prior to their re-registration pursuant to Section 4(c)(3) of the general permit, and in no case later than one hundred twenty (120) days after the effective date of this general permit to ensure and maintain compliance with any applicable term and condition of this general permit.

For previously authorized sites discharging to impaired waters or other sensitive areas, the commissioner may require additional control measures or provide authorization under an individual permit pursuant to Sections 4(i) and 3(i). The Permittee shall ensure that any person keeping this Plan or part thereof current, under the Keeping Plans Current section of this permit, has qualifications that would be required under this general permit to initially prepare the Plan or part thereof. The permittee shall retain as part of the Plan all modifications, and any documentation associated with each modification, made under this Section 5(b)(5) of the General Permit.

The Contractor responsible for the measures at the site will amend the SWPCP if there is a change in contractors or subcontractors at the Site, or a change in design, construction, operation, or maintenance at the Site which has the potential for the discharge of pollutants as a result of stormwater runoff. The permittee and their consultant shall be notified if amendments to the SWPCP or control measures utilized at the Site fail to prevent stormwater runoff pollution.

The CT DEEP may notify the permittee at any time that the SWPCP and/or Site does not meet the requirements of the permit, and the permittee will be required to modify the plan within 7 days to address the concerns of CT DEEP. Within 15 days, the permittee shall submit a written certification that the requested changes

14.0 NOTICE OF TERMINATION FORM

At the completion of a construction project the Permittee shall submit a Notice of Termination in accordance with the requirements of this section. A project shall be considered complete after all postconstruction measures are installed, cleaned, functioning, and inspected and the site has achieved final stabilization and inspection (see Sections 5(b)(4)(C) & (D) of the general permit, respectively) for at least one full growing season (i.e. April through October) in the year following the cessation of construction activities. Final stabilization must be achieved for all phases of construction, and for solar projects, any additional requirements in Appendix I complied with, before a Notice of Termination may be submitted.

A Notice of Termination shall be filed on forms prescribed and provided by the commissioner.

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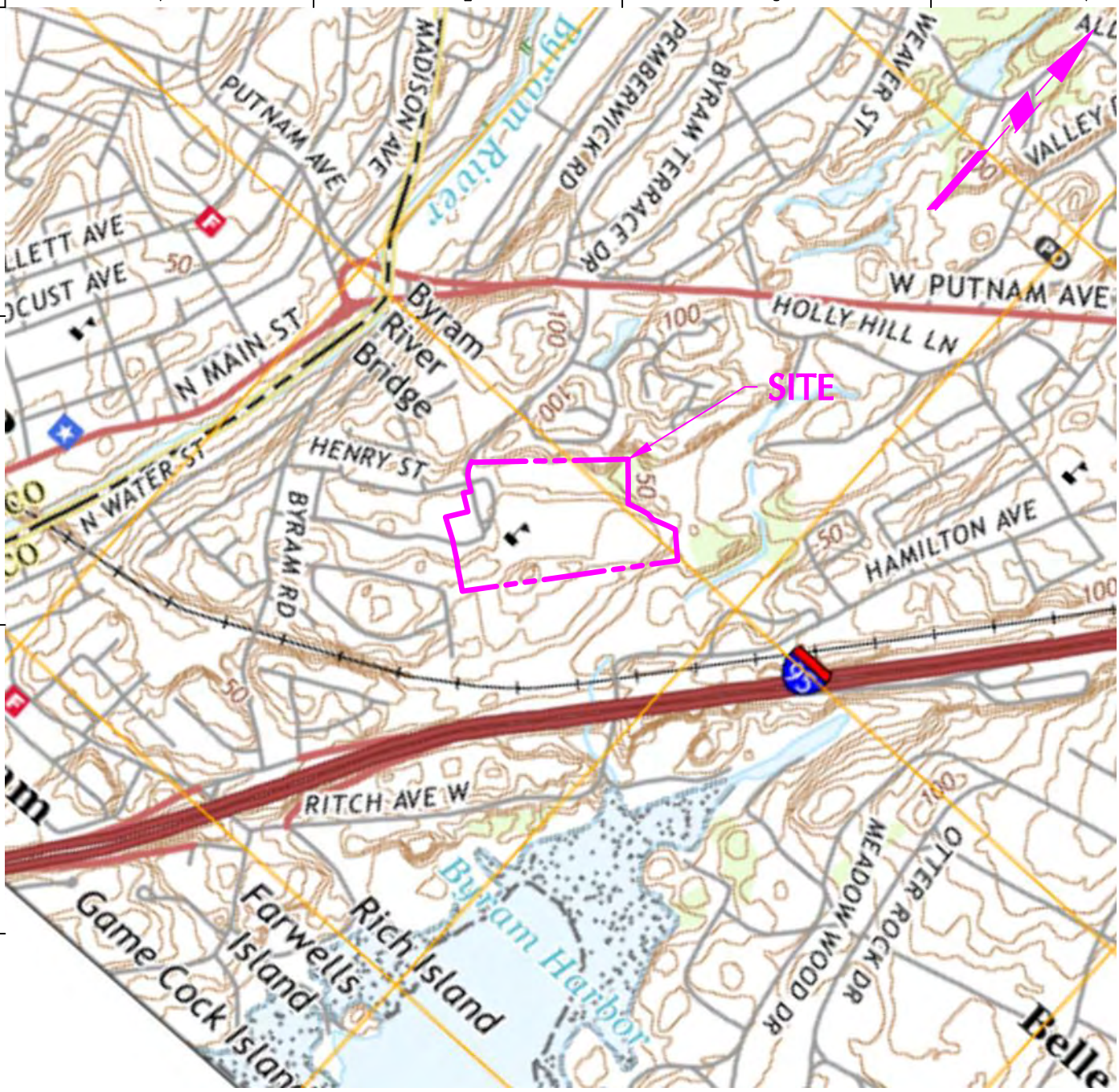

REFERENCE: USGS 7.5-MINUTE MAP FOR GLENVILLE, CONNECTICUT, U.S. GEOLOGICAL SURVEY, DATED 2021.

1000 0 500 1000

SCALE: 1 INCH = 1000 FEET

LANGAN

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T: 203.562.5771 F: 203.789.6142 www.langan.com

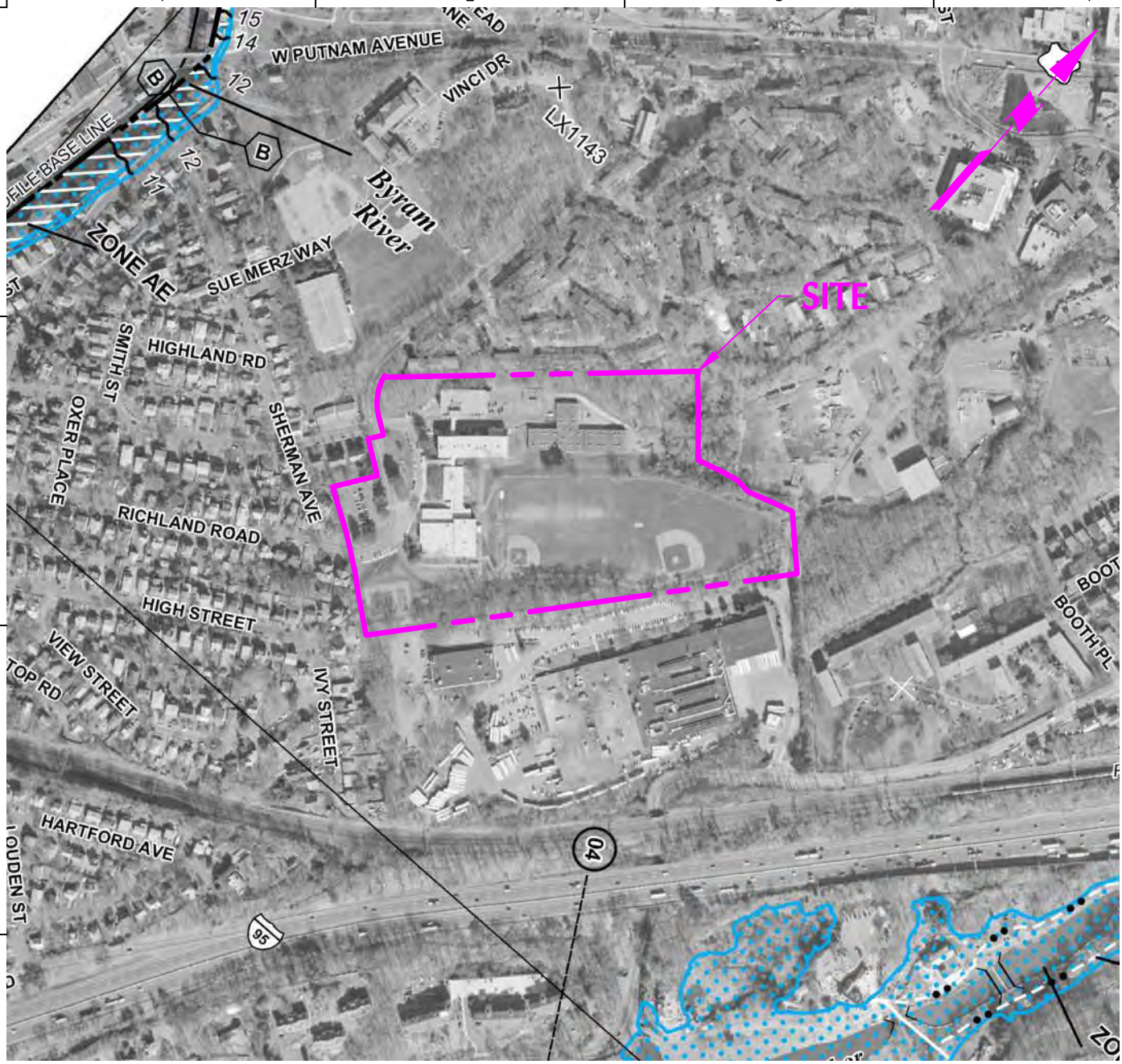
Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
USGS LOCATION MAP

Project No. 140148202
Date 12/8/2021
Drawn By BTW
Checked By BP

Drawing No.
FIG. 1
Sheet 1 of 3

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Figures\FIG.1.dwg Date: 3/17/2022 Time: 10:06 User: bwillsey Style Table: Langan.stb Layout: FIG.1



LEGEND	ZONE	DESCRIPTION
	AE FLOODWAY	THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASE IN FLOOD HEIGHTS.
	AE	BASE FLOOD ELEVATIONS DETERMINED
	VE	COASTAL FLOOD ZONE WITH VELOCITY HAZARD (WAVE ACTION); BASED ON FLOOD ELEVATIONS DETERMINED.
	X UNSHADED	AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

500 0 250 500

SCALE: 1 INCH = 500 FEET

REFERENCE: "FLOOD INSURANCE RATE MAP" FAIRFIELD, CONNECTICUT, MAP NUMBER 09001C0494G, EFFECTIVE DATE 07/08/2013.

LANGAN

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
FEMA FLOOD MAP

Project No. 140148202
Date 12/8/2021
Drawn By BTW
Checked By BP

Drawing No.
FIG. 2
Sheet 2 of 3

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Figures\FIG.2.dwg Date: 3/17/2022 Time: 10:06 User: bwillsey Style Table: Langan.stb Layout: FIG.2

NOTES

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
   a. THIS SURVEY IS A PROPERTY SURVEY CONFORMING TO A HORIZONTAL ACCURACY OF A-2 AND A PARTIAL TOPOGRAPHIC SURVEY CONFORMING TO A T-2 ACCURACY. THE BOUNDARY DETERMINATION IS A RESURVEY. THE PURPOSE OF THIS SURVEY IS TO PROVIDE A BOUNDARY OPINION AND DEPICT SITE FEATURES.

2. THIS SURVEY IS BASED UPON EXISTING PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, DEED INFORMATION AND THE FOLLOWING REFERENCES:

   A. MAP TITLED "MAP OF BYRAM CREST PARK BELONGING TO TIMOTHY LOUGHLIN SITUATE IN THE TOWN OF GREENWICH, CONNECTICUT", SCALE: 1"=60', DATED: AUGUST, 1910, BY: S.E. MINOR. RECORDED IN GREENWICH LAND RECORDS AS MAP #457.

   B. MAP TITLED "MAP OF HIGHLAND PARK EXTENSION IN THE TOWN OF GREENWICH, CONNECTICUT, THE PROPERTY OF SEAMAN AND HENILECKY", SCALE: 1"=40', DATED: JANUARY 21, 1925, BY: F.S. ODELL ENGINEERING CORP., RECORDED IN GREENWICH LAND RECORDS AS MAP #1002.

   C. MAP TITLED "PROPERTY OF TOWN OF GREENWICH, GREENWICH, CONNECTICUT", SCALE: 1"=100', DATED: MARCH 9, 1959, REVISED TO ARPIL 24, 1959, BY: S.E. MINOR & CO., INC., RECORDED IN GREENWICH LAND RECORDS AS MAP #4027.

   D. MAP TITLED "SURVEY AND UNIT NUMBERING AND PARKING PLAN OF "SIXTY-SIX RICHLAND ROAD CONDOMINIUM" IN GREENWICH, CONNECTICUT, PREPARED FOR BYRAM HEIGHTS DEVELOPMENT CORPORATION", SCALE: 1"=10', DATED: APRIL 26, 1986, BY: ROCCO V. D'ANDREA, INC. RECORDED IN GREENWICH LAND RECORDS AS MAP #6359.

   E. MAP TITLED "MAP SHOWING SPLIT LOT FOR SYLVIA B. ELROD, GREENWICH, CONNECTICUT", SCALE: 1"=20', DATED: FEBRUARY 6, 1998, BY: S.E. MINOR & CO., INC., RECORDED IN GREENWICH LAND RECORDS AS MAP #7295.

   F. MAP TITLED "MAP SHOWING SUBDIVISION OF PROPERTY IN GREENWICH, CONNECTICUT, PREPARED FOR MOUNTAINVIEW GROUP, LLC", SCALE: 1"=20', DATED: AUGUST 16, 1999, BY: ROCCO V. D'ANDREA, INC., RECORDED IN GREENWICH LAND RECORDS AS MAP #7398.

3. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO CONNECTICUT STATE PLANE COORDINATE SYSTEM NAD 83 (EPOCH 2011). POSITION WAS DETERMINED BY GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) AS PROVIDED BY HXGN SMARTNET CONTINUOUSLY OPERATED REFERENCE STATIONS (CORS).

4. ELEVATIONS SHOWN ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 12B) AS DETERMINED BY GNSS

5. PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY LANGAN CT, INC. FIELD WORK COMPLETED DURING THE MONTH OF APRIL 2021.

6. AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM MAP ENTITLED "FAIRFIELD COUNTY, CONNECTICUT PANEL 494 OF 626, MAP NUMBER 09001C0494G, EFFECTIVE DATE JULY 8, 2013" THE PROJECT AREA IS IN ZONE X (UNSHADED).

7. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.

8. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS.

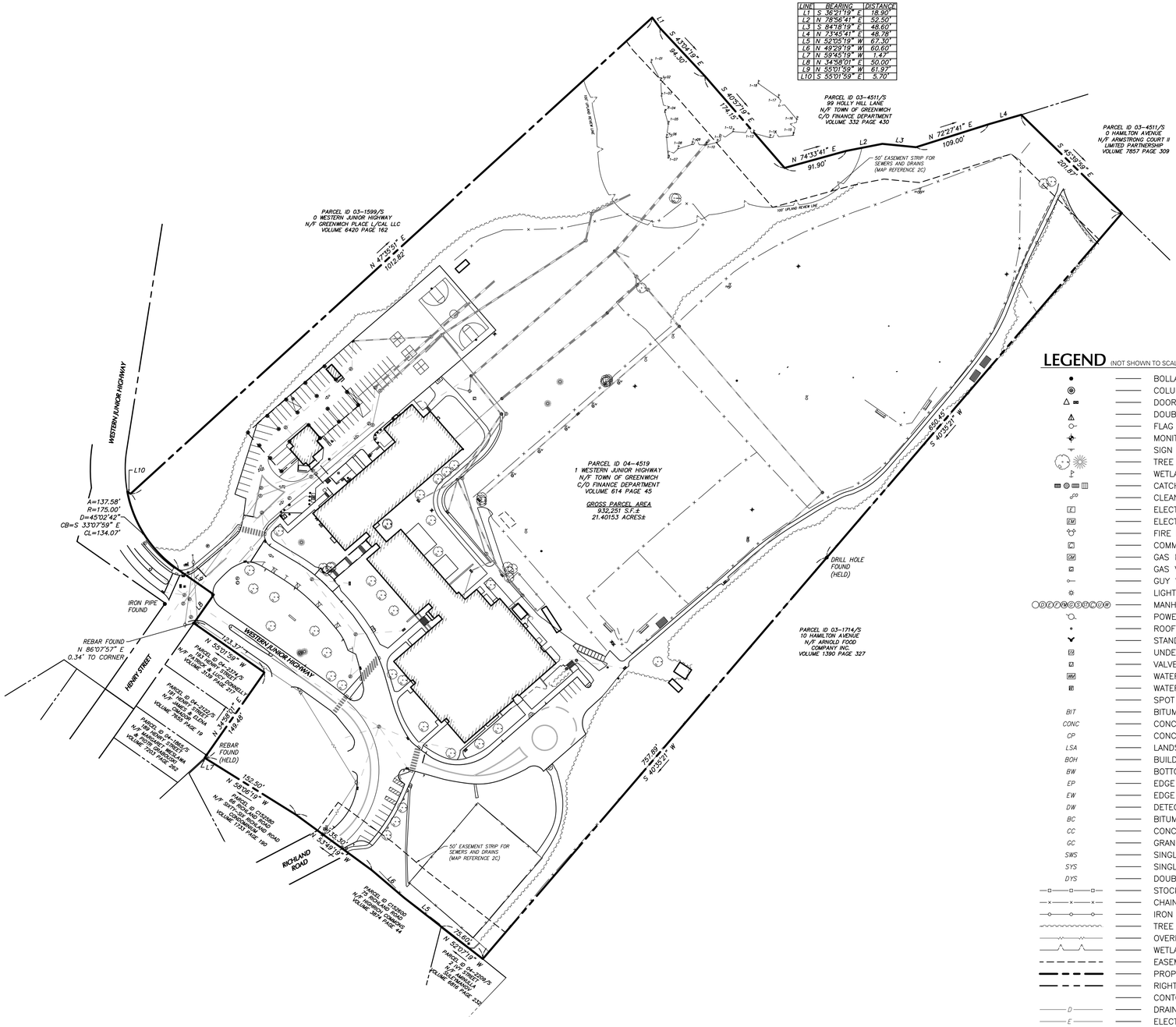
9. UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.

10. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.

11. WETLANDS WERE DELINEATED BY ALL-POINTS TECHNOLOGY IN AUGUST OF 2021.

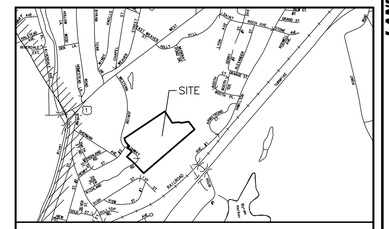
12. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.

13. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.



80 0 40 80
SCALE: 1 INCH = 80 FEET

LINE	BEARING	DISTANCE
L1	S 36°21'19" E	18.90'
L2	N 78°56'41" E	52.50'
L3	S 84°18'19" E	48.60'
L4	N 73°45'41" E	48.78'
L5	N 52°05'19" W	67.30'
L6	N 49°29'19" W	60.60'
L7	N 59°45'19" W	1.47'
L8	N 34°58'01" E	50.00'
L9	N 55°01'59" W	61.97'
L10	S 55°01'59" E	5.70'



PROJECT LOCATION MAP

SCALE: 1"=1500'

SOURCE:
CONNECTICUT DEPARTMENT OF TRANSPORTATION

CT NAD 83

LEGEND (NOT SHOWN TO SCALE)

- BOLLARD
- COLUMN
- DOOR
- DOUBLE DOOR
- FLAG POLE
- MONITORING WELL
- SIGN
- TREE
- WETLAND FLAG
- CATCH BASIN
- CLEANOUT
- ELECTRIC BOX
- ELECTRIC METER
- FIRE HYDRANT
- COMMUNICATION BOX
- GAS METER
- GAS VALVE
- GUY WIRE
- LIGHT POLE
- MANHOLE (TYPE AS LABELED)
- POWER POLE
- ROOF DRAIN
- STANDPIPE
- UNDERGROUND VAULT
- VALVE UNKNOWN
- WATER METER
- WATER VALVE
- SPOT ELEVATION
- BIT — BITUMINOUS
- CONC — CONCRETE
- CP — CONCRETE PAD
- LSA — LANDSCAPED AREA
- BOH — BUILDING OVERHANG
- BW — BOTTOM OF WALL
- EP — EDGE OF PAVEMENT
- EW — EDGE OF WALK
- DW — DETECTABLE WARNING
- BC — BITUMINOUS CURB
- CC — CONCRETE CURB
- GC — GRANITE CURB
- SWS — SINGLE WHITE STRIPE
- SYS — SINGLE YELLOW STRIPE
- DYS — DOUBLE YELLOW STRIPE
- STOCKADE FENCE
- CHAINLINK FENCE
- IRON FENCE
- TREE LINE
- OVERHEAD WIRE
- WETLAND LINE
- EASEMENT LINE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CONTOUR LINE
- D — DRAINAGE MARK OUT LINE
- E — ELECTRIC MARK OUT LINE
- C — COMMUNICATION MARK OUT LINE
- G — GAS MARK OUT LINE
- S — SANITARY SEWER MARK OUT LINE
- W — WATER MARK OUT LINE
- UNK — UNKNOWN MARK OUT LINE
- R* — REFERENCE UTILITY LINE (TYPE AS NOTED) - PLOTTED FROM EXISTING MAPPING

STATE OF CONNECTICUT
ANDREW G. IVES
NO. 70286
LICENSED
LAND SURVEYOR

Date	Description	No.
REVISIONS		

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

ANDREW G. IVES — DATE SIGNED
PROFESSIONAL LAND SURVEYOR
CT STATE LIC. NO. 70286

LANGAN

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

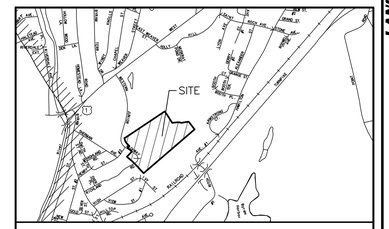
Drawing Title

BOUNDARY SURVEY

Project No.	Drawing No.
140148202	VB101
Date: MAY 12, 2021	
Drawn By: JRL	
Checked By: AGI	Sheet 1 of 2

PROJECT NO. 140148202

LANGAN



PROJECT LOCATION MAP

SCALE: 1"=1500'

SOURCE:
CONNECTICUT DEPARTMENT OF TRANSPORTATION

STATE OF CONNECTICUT
ANDREW G. IVES
NO. 70286
LICENSED
LAND SURVEYOR

Date	Description	No.
REVISIONS		

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

ANDREW G. IVES DATE SIGNED
PROFESSIONAL LAND SURVEYOR
CT STATE LIC. NO. 70286

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

Drawing Title

PARTIAL TOPOGRAPHIC SURVEY

Project No.	Drawing No.
140148202	VT102
Date: **MAY 12, 2021**	
Drawn By: **JRL**	
Checked By: **AGI**	Sheet 2 of 2

40 0 10 25 40
SCALE: 1 INCH = 40 FEET

PROJECT NO. 140148202

LANGAN

EXISTING BUILDING

EXISTING BUILDING

EXISTING BUILDING

EXISTING BUILDING

100' UPLAND REVIEW LINE

1-01 1-02 1-03 1-04 1-05 1-06 1-07 1-08 1-09 1-10 1-11 1-12 1-13 1-14 1-15 1-16 1-17 1-18

APPROXIMATE LIMIT OF EXCAVATION. COORDINATE WITH ENVIRONMENTAL WORK.

LANDSCAPED AREA (TYP.)

LA

16' SWING GATE

4' CHAIN LINK FENCE

END OF ATHLETIC NETTING

END OF 6' CLF
START OF 4' CLF

4' CHAIN LINK FENCE WITH 20' ATHLETIC NETTING

6' CHAIN LINK FENCE WITH SAFETY CAP

100' UPLAND REVIEW LINE

50' EASEMENT STRIP FOR SEWERS AND DRAINS (MAP REFERENCE 2C)

10'

24' ALUMINUM BENCH

FLUSH CONCRETE CURB (TYP.)

360'

10'

220'

180'

330'

10'

18'

300'

350'

40'

12'

5'

25'

8'

5'

19'

8'

BITUMINOUS CONCRETE WALK

BITUMINOUS CONCRETE PAVEMENT

4' CHAIN LINK FENCE WITH 20' ATHLETIC NETTING

END OF ATHLETIC NETTING

4' CHAIN LINK FENCE

CHAIN LINK FENCE BACKSTOP WITH 30' ATHLETIC NETTING

KNEE WALL W/ 4' FENCE

18' (TYP.)

10'
8'
8'

SAWCUT (TYP.)

16' SWING GATE

LIMIT OF 15' X 8.5' CONCRETE BLEACHER PAD

4 ROW STEEL BLEACHER (15' LONG, 7' WIDE)

3' WIDE ACCESS GATE

END OF ATHLETIC NETTING

4' CHAIN LINK FENCE

3' WIDE ACCESS GATE

END OF 8' CLF
START OF 4' CLF

8' CHAIN LINK FENCE

SYNTHETIC TURF

16' SWING GATE

BITUMINOUS CONCRETE PAVEMENT

CHAIN LINK FENCE BACKSTOP WITH 30' ATHLETIC NETTING

6' X 30' PRECAST CONCRETE DUGOUT MANUFACTURED BY EASI-SET BUILDINGS (OR APPROVED EQUAL) (TYP.)

3' WIDE ACCESS GATE

8' CHAIN LINK FENCE

16' SWING GATE

END OF 8' CLF
START OF 4' CLF

LIMIT OF 15' X 8.5' CONCRETE BLEACHER PAD

4 ROW STEEL BLEACHER (15' LONG, 7' WIDE)

10' SWING GATE

8' (TYP.)

FIELD LIGHTING FIXTURE FOUNDATION (TYP.)

FOULPOLE (TYP.)

40 0 10 25 40
SCALE: 1 INCH = 40 FEET

Date	Description	No.
8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1

REVISIONS

LANGAN

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

Drawing Title

SITE PLAN

Project No.	Drawing No.
140148202	CS101
Date: **6/8/2022**	
Drawn By: **BTW**	
Checked By: **BP**	

Sheet 3 of 9

PROJECT NO. 140148202

CUT/FILL TABLE

± 5,000 CY (CUT)
±15,000 CY (FILL)
±10,000 CY (NET FILL)

*NOTE THESE VALUES ARE TAKEN FROM PROPOSED GRADE TO EXISTING GRADE AND DO NOT INCLUDE ANY SOIL TO BE REMOVED FROM THE SITE AS A PART OF THE REMEDIAL ACTION PLAN (RAP).

APPROXIMATE LIMIT OF EXCAVATION. COORDINATE WITH ENVIRONMENTAL WORK.

PERFORATED UNDERDRAINAGE PIPE PLACED 30 FEET ON CENTER @ 0.5% SLOPE WITH MINIMUM 12" COVER (TYP.)

12" PERFORATED HDPE PERIMETER COLLECTOR PIPE IN STONE TRENCH @ 0.5% SLOPE (TYP.)

ex MH
GR: 57.5
INV. IN (18" SE): 55.6
ex INV. OUT (18" NW): 54.9

64 LF 18" HDPE @ 29.45%

12 LF 18" HDPE @ 0.51%

MH-100
GR: 81.3
INV. IN (12" SE): 74.5
INV. IN (18" SW): 75.4
INV. IN (18" NE): 74.9
INV. OUT: 74.5

12 LF 18" HDPE @ 0.48%

OCS-114
GR: 81.2
INV. IN (12" SW): 76.1
INV. IN (12" SE): 75.5
INV. OUT: 75.5
SUMP: 73.5

OCS-116
GR: 81.4
INV. IN (12" NE): 75.4
INV. IN (12" SE): 74.9
INV. OUT: 74.9
SUMP: 72.9

323 LF 12" HDPE @ 0.50%

2.0' (TYP.)

SLOPE TO BE LESS THAN 2% WITHIN ALL ADA ACCESSIBLE PARKING SPACES. CONTRACTOR TO FIELD VERIFY EXISTING SLOPES ARE ACCEPTABLE.

YD-115
GR: 81.2
INV. IN (12" SW): 77.0
INV. OUT: 77.0

YD-107
GR: 79.6
INV. OUT: 77.8
SUMP: 75.8

128 LF 12" HDPE @ 0.50%

YD-106
GR: 79.6
INV. IN (12" SW): 77.2
INV. OUT: 77.2
SUMP: 75.2

117 LF 12" HDPE @ 0.50%

MH-101
GR: 81.4
INV. IN (12" E): 76.2
INV. IN (12" SW): 76.6
INV. OUT: 76.2
SUMP: 74.2

27 LF 12" HDPE @ 0.50%

YD-103
GR: 81.74
INV. IN (12" NE): 76.83
INV. OUT: 76.84
SUMP: 74.83

96 LF 12" HDPE @ 0.50%

YD-102
GR: 81.5
INV. IN (12" NE): 76.4
INV. OUT: 76.4
SUMP: 74.4

YD-105
GR: 81.47
INV. OUT: 78.05
SUMP: 76.05
110 LF 12" HDPE @ 0.50%

YD-104
GR: 81.4
INV. IN (12" NE): 77.5
INV. OUT: 77.5
SUMP: 75.5
134 LF 12" HDPE @ 0.50%

PARCEL ID 03-4511/S
99 HOLLY HILL LANE
N/F TOWN OF GREENWICH
C/O FINANCE DEPARTMENT
VOLUME 332 PAGE 430

PARCEL ID 03-1714/S
10 HAMILTON AVENUE
N/F ARNOLD FOOD
COMPANY INC.
VOLUME 1390 PAGE 3

100' WETLAND REVIEW LINE

40 0 10 25 40
SCALE: 1 INCH = 40 FEET

Date	Description	No.
8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1

REVISIONS

STATE OF CONNECTICUT · CHRISTOPHER P. PHILLIPS · 28321 · REGISTERED PROFESSIONAL ENGINEER

LANGAN

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

Drawing Title

GRADING & DRAINAGE PLAN

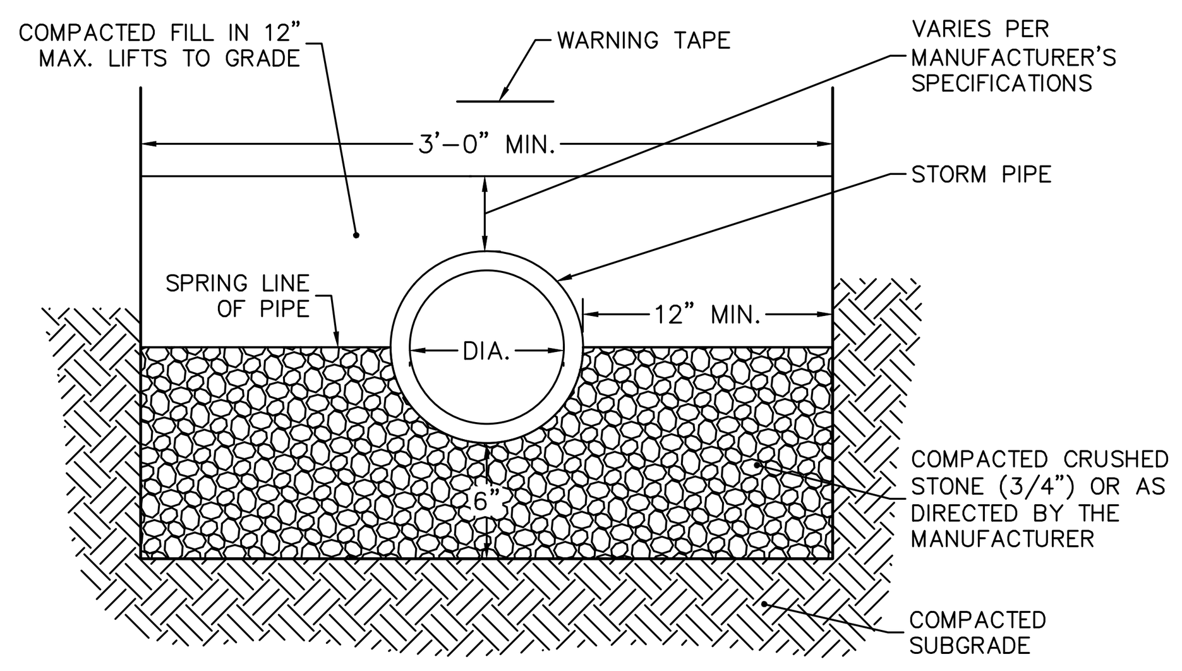
Project No.	Drawing No.
140148202	CG101
Date: **8/11/2022**	
Drawn By: **BTW**	
Checked By: **BP**	

Sheet 6 of 9

LANGAN

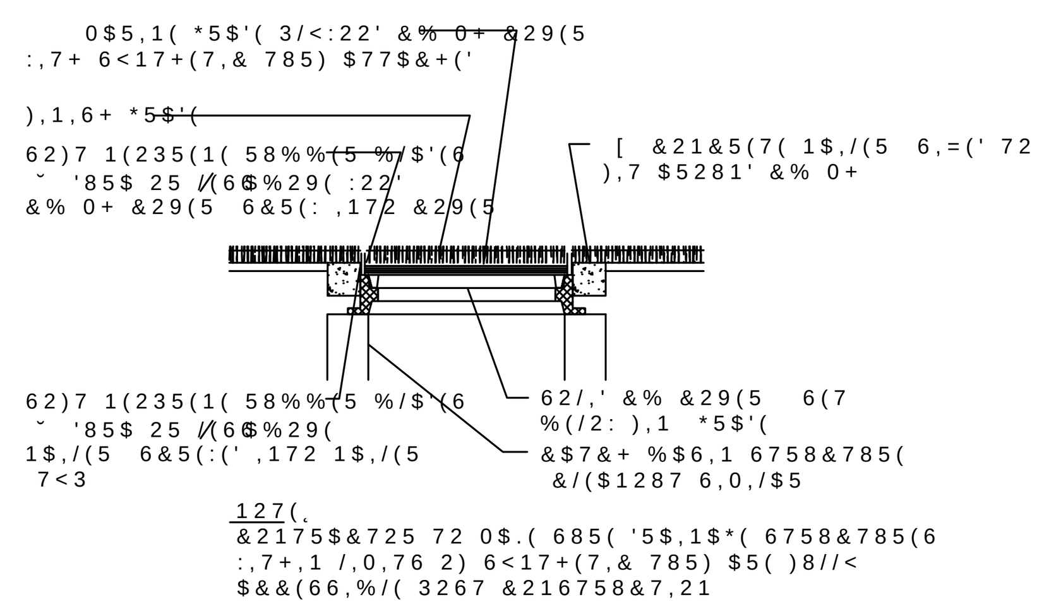
PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Civil\140148202-CG101-0101.dwg Date: 8/11/2022 Time: 14:29 User: bphillips Style Table: Langan.stb Layout: CG101

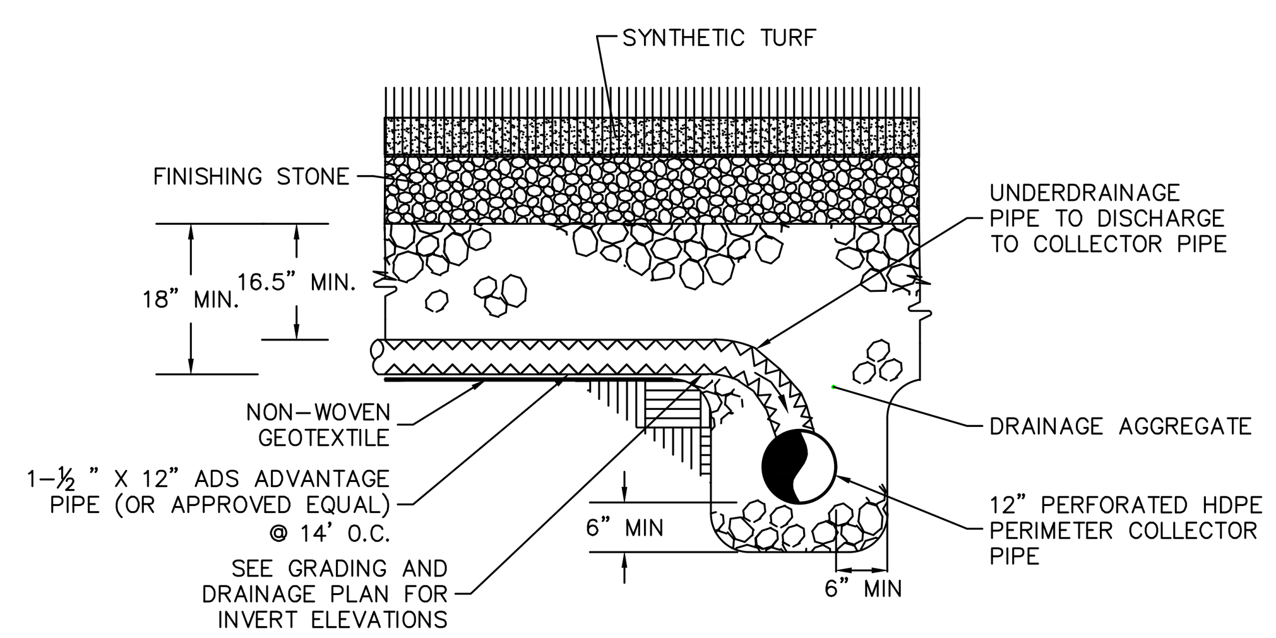


NOTES:
1. ALL BACKFILL SPECIFICATIONS TO CONFORM TO GEOTECHNICAL ENGINEER REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.

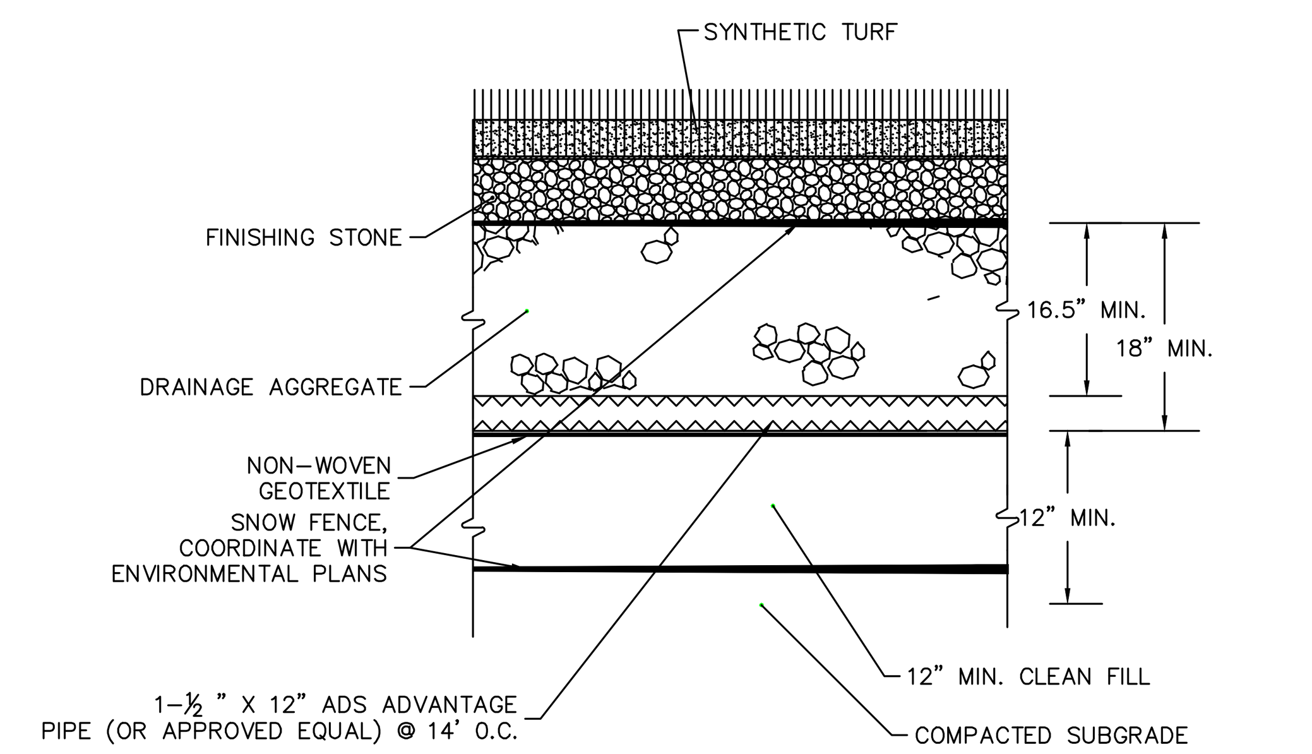
1 STORM PIPE BEDDING
N.T.S



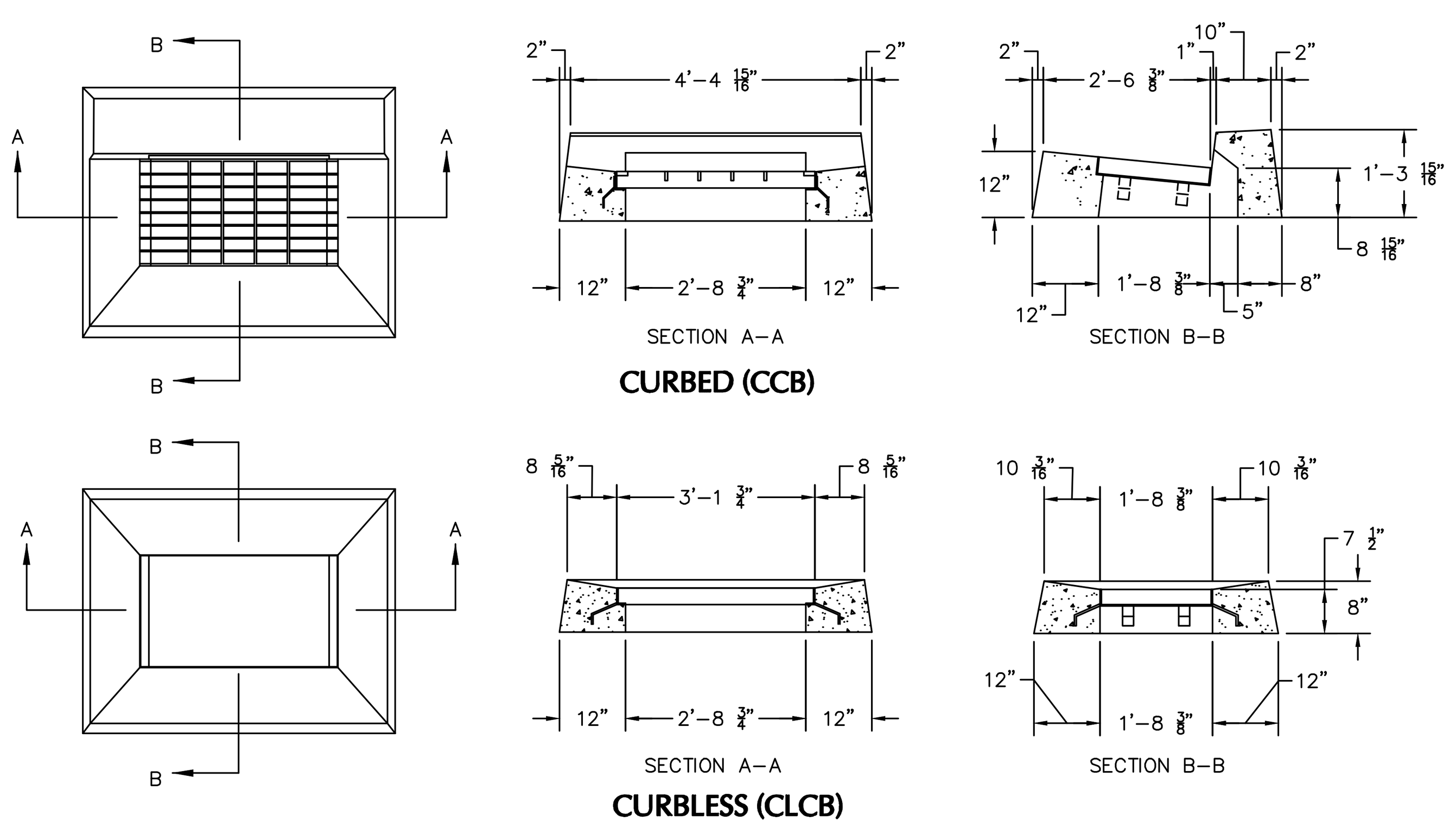
2 MANHOLE COVER AT SYNTHETIC TURF
N.T.S



3 COLLECTOR PIPE
N.T.S

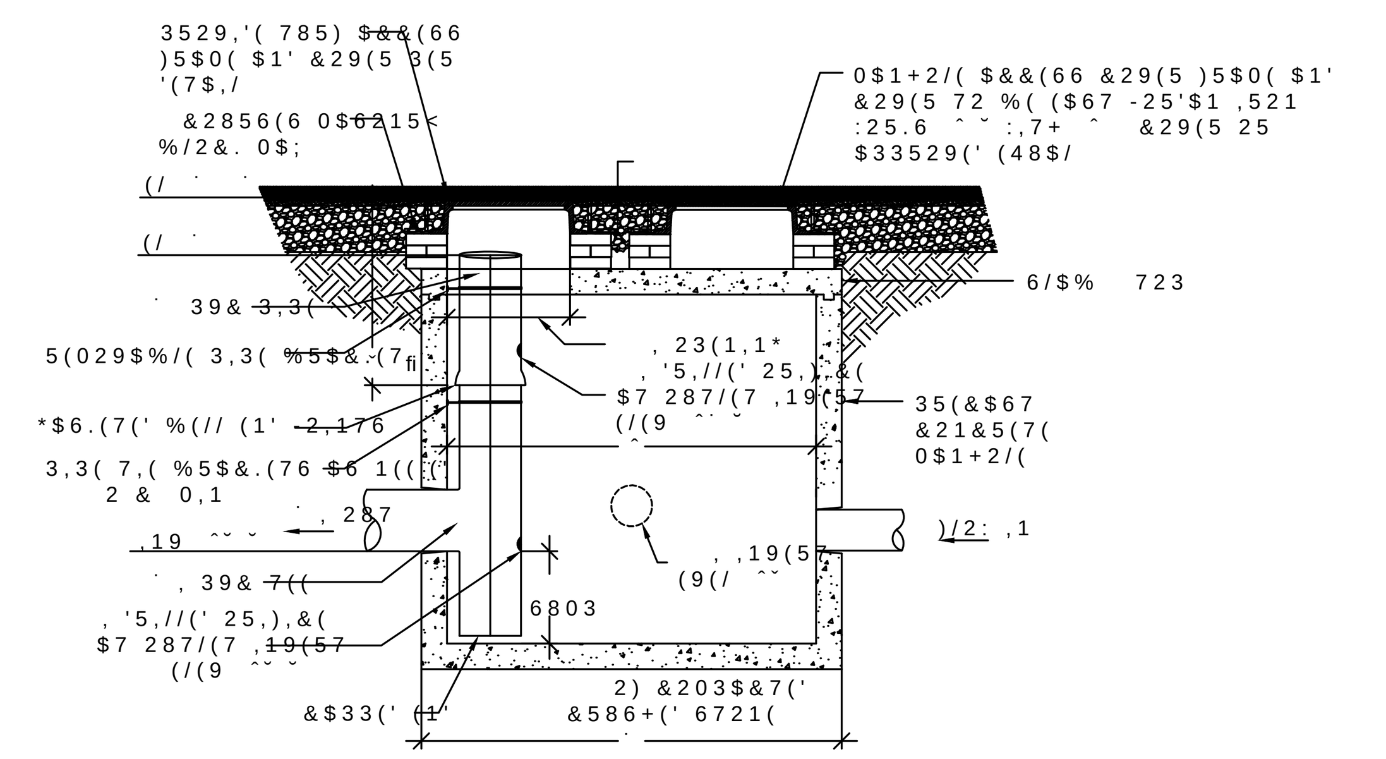


4 PERFORATED UNDERDRAIN
N.T.S

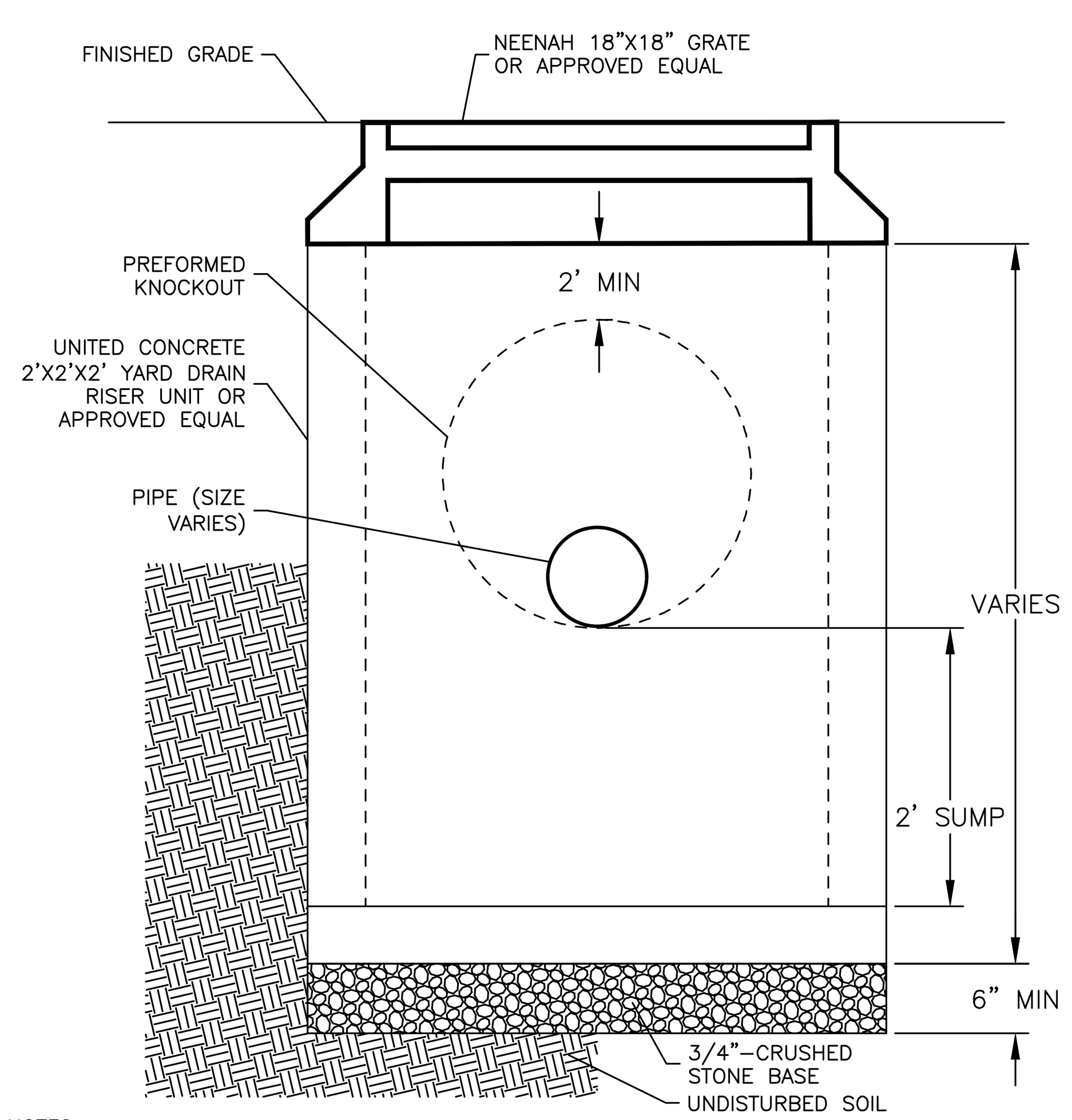


NOTES:
ALL STEEL GRATES AND FRAMES TO BE GALVANIZED IN CONFORMANCE WITH FORM 818 ARTICLE M.06.03.

5 CATCH BASIN TOP
N.T.S

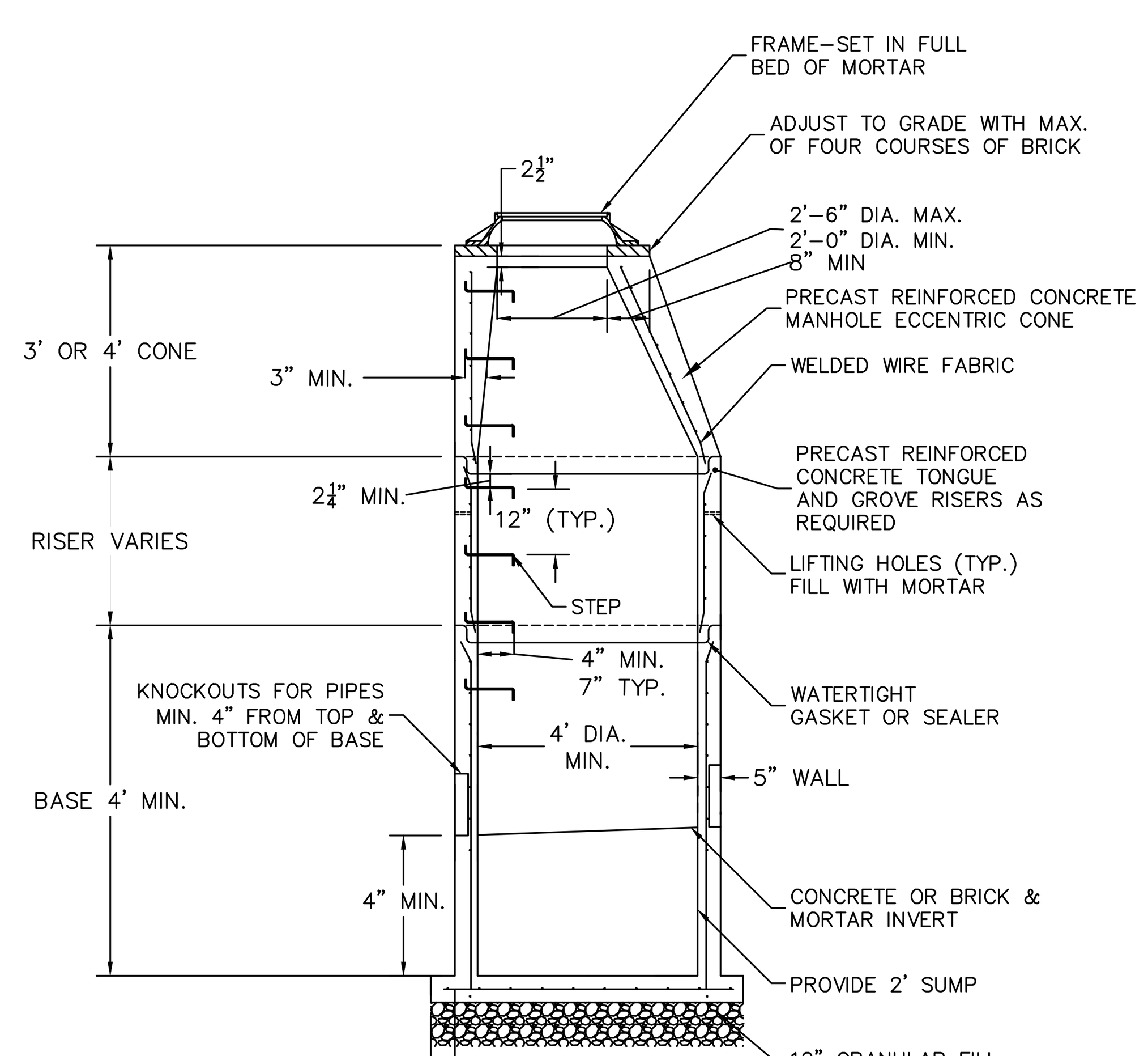


6 OUTLET CONTROL STRUCTURE (OCS-114)



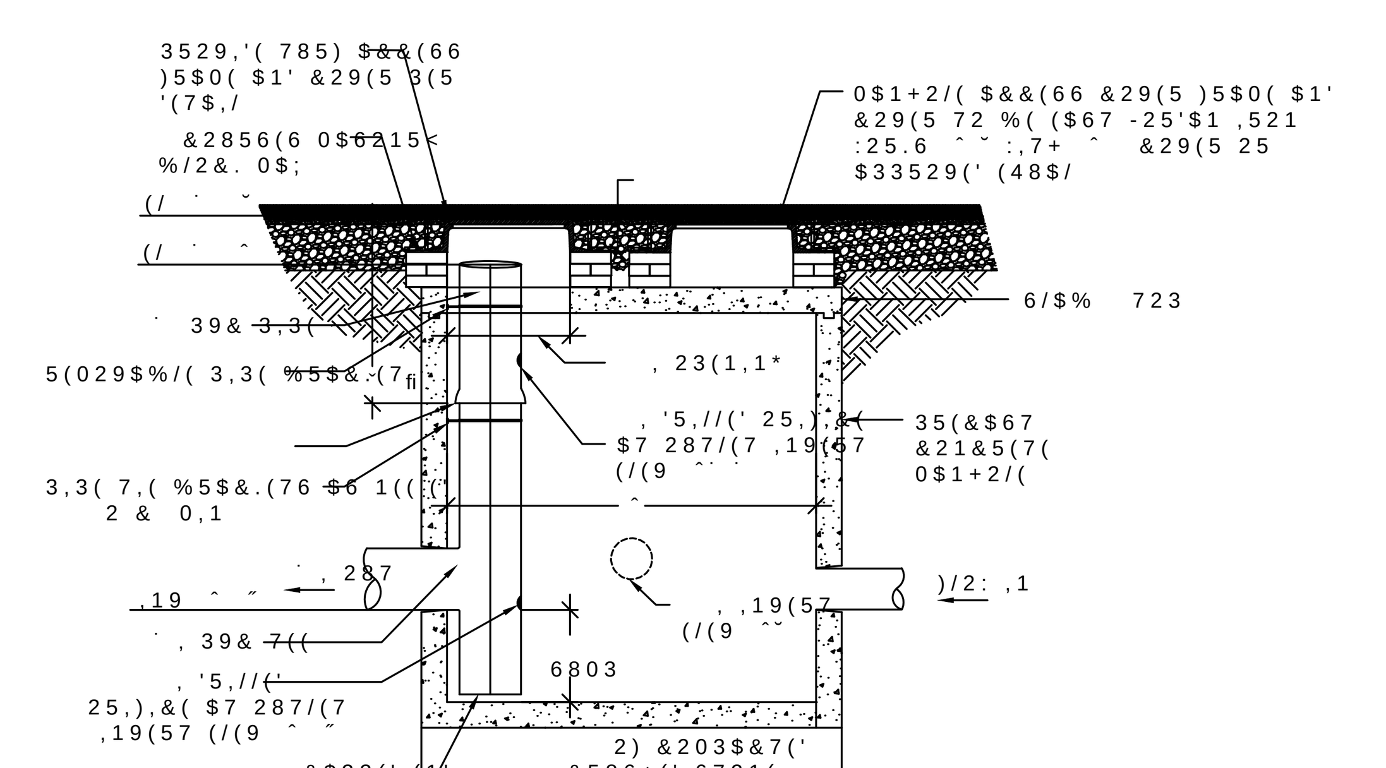
NOTES:
1. GRATES SHALL BE ROUND IN LAWN/FIELD AREAS AND SQUARE IN HARDSCAPE AREAS.
2. NEENAH ADA COMPLIANT TYPE "Q" GRATES OR APPROVED EQUAL (MAXIMUM SLOT OPENING 1/2" MAX.) SHALL BE USED IN ALL ADA ACCESSIBLE AREAS AND WHERE SPECIFIED. CONTRACTOR TO CONFIRM WHETHER OR NOT A GRATE IS LOCATED WITHIN AN ACCESSIBLE ROUTE.
3. GRATES SHALL BE CAPABLE OF H20 LOADING.

7 YARD DRAIN
N.T.S



NOTES:
1. ALL STRUCTURE COMPONENTS TO BE PRE-CAST REINFORCED CONCRETE, ABLE TO WITHSTAND THE APPLIED EARTH LOADS WITH AN HS-20 TRUCK LOAD.
2. ALL JOINTS TO BE MORTARED.
3. STRUCTURE SHALL CONFORM TO ASTM C478.

8 STORM MANHOLE
N.T.S



9 OUTLET CONTROL STRUCTURE (OCS-116)

Date	Description	No.
8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1

REVISIONS

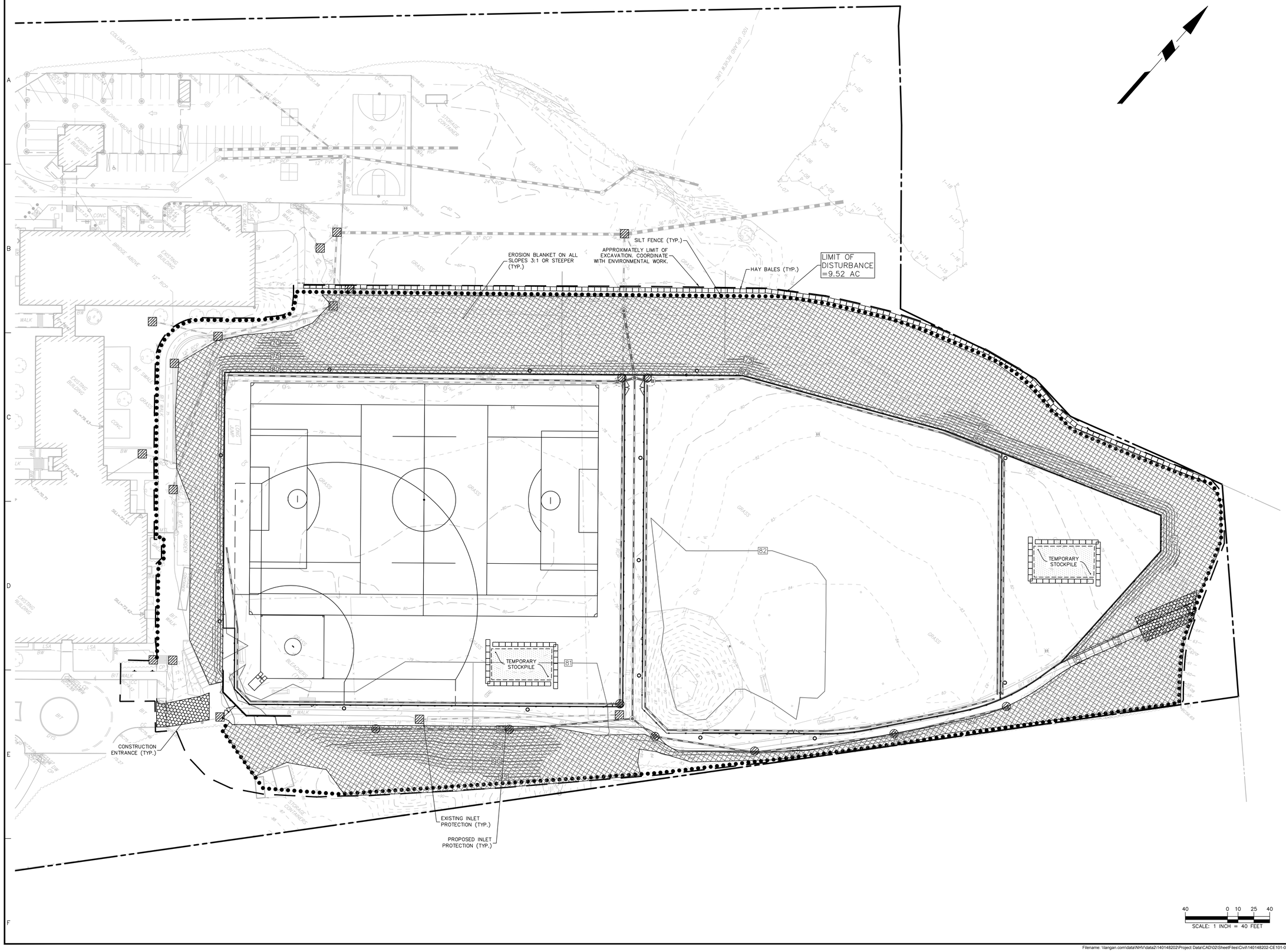
LANGAN

Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
GRADING & DRAINAGE DETAILS

Project No. 140148202
Date 6/17/2022
Drawn By BTW
Checked By BP
Drawing No. CG501
Sheet 7 of 9

PROJECT NO. 140148202



Date	Description	No.
8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1

REVISIONS

LANGAN

Langan CT, Inc.
555 Long Wharf Drive
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

Drawing Title

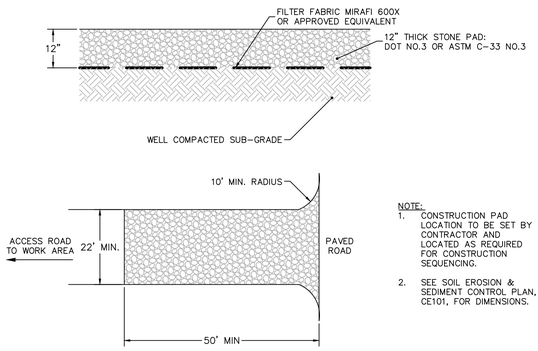
SOIL EROSION & SEDIMENT CONTROL PLAN

Project No.	Drawing No.
140148202	CE101
Date: **6/17/2022**	
Drawn By: **BTW**	
Checked By: **BP**	Sheet 8 of 9

LANGAN

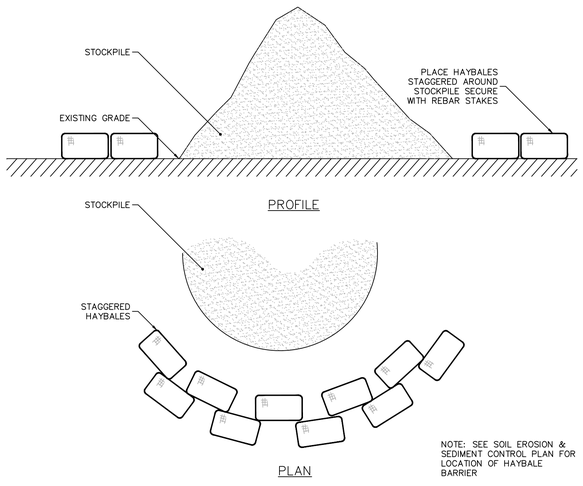
PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Civil\140148202-CE101-0101.dwg Date: 8/11/2022 Time: 10:18 User: bwillsey Style Table: Langan.stb Layout: CE101



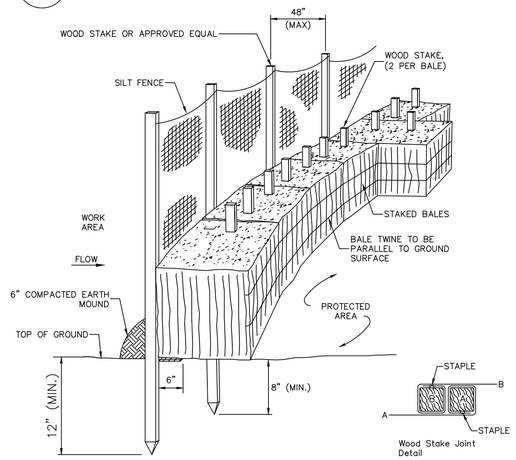
NOTE:
1. CONSTRUCTION PAD LOCATION TO BE SET BY CONTRACTOR AND LOCATED AS REQUIRED FOR CONSTRUCTION SEQUENCING.
2. SEE SOIL EROSION & SEDIMENT CONTROL PLAN, CE101, FOR DIMENSIONS.

1 CONSTRUCTION ENTRANCE
N.T.S



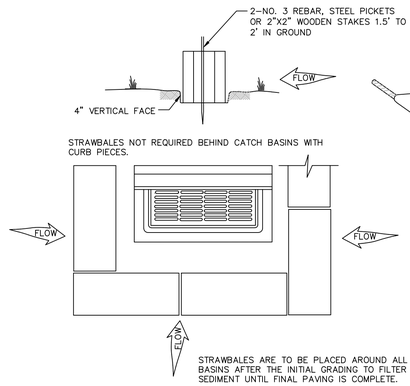
NOTE: SEE SOIL EROSION & SEDIMENT CONTROL PLAN FOR LOCATION OF HAYBALE BARRIER

4 TEMPORARY STOCKPILE
N.T.S

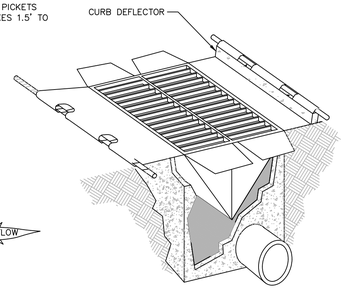


6 STAKED HAY BALES/SILT FENCE
N.T.S

SECURE "SILTSACK" FILTER
(OR EQUIVALENT) TO GRATE.

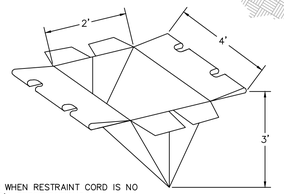


STRAWBALES ARE TO BE PLACED AROUND ALL CATCH BASINS AFTER THE INITIAL GRADING TO FILTER AND DIVERT SEDIMENT UNTIL FINAL PAVING IS COMPLETE.



TYPE B – CURB INLET

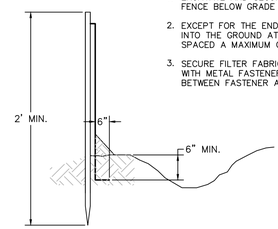
"SILTSACK"
DISTRIBUTOR:
ACS ENVIRONMENTAL
800-644-9223



NOTES:
1. CONTRACTOR IS TO CLEAN INLET FILTER WHEN RESTRAINT CORD IS NO LONGER VISIBLE AS PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR TO REMOVE FILTER JUST PRIOR TO PAVING.

2 INLET PROTECTION
N.T.S

INSTALLATION NOTES:
1. EXCAVATE AND SECURE BOTTOM 6" OF SILT FENCE BELOW GRADE AS SHOWN.
2. EXCEPT FOR THE END POST, DRIVE ALL POSTS INTO THE GROUND AT BACK SIDE OF TRENCH SPACED A MAXIMUM OF 8 FT O. C.
3. SECURE FILTER FABRIC WITH DRAWSTRING TO POST WITH METAL FASTENERS AND REINFORCEMENT BETWEEN FASTENER AND FABRIC.

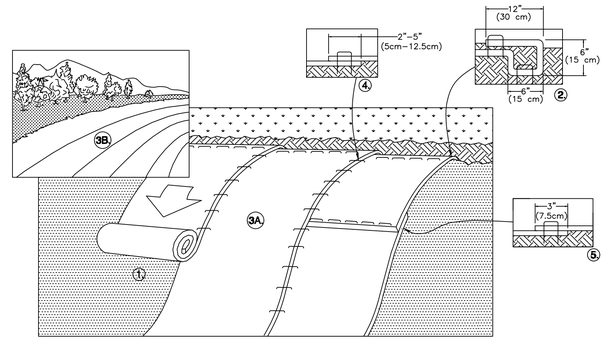


3 SILT FENCE
N.T.S

NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS
14649 HIGHWAY 41 NORTH
EVANSVILLE, IN 47725
800-772-2040
www.nagreen.com

BIONET SC150BN DOUBLE NET STRAW BLANKET – BIODEGRADABLE (OR APPROVED EQUAL)

SLOPE INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM® , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

NOTE:
CONTRACTOR TO PROVIDE EROSION CONTROL BLANKET ON ALL SLOPES 3:1 OR STEEPER.

5 SLOPE STABILIZATION (SLOPES ≥3H:1V)
N.T.S

No.	Description	Date
1	RESPONSE TO TOWN ENGINEER'S COMMENTS	8/11/2022

REVISIONS

STATE OF CONNECTICUT · CHRISTOPHER T. PHILLIPS · PENGINEER

LANGAN
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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SOIL EROSION & SEDIMENT CONTROL DETAILS

Project No. 140148202	Drawing No. CE501
Date 6/17/2022	
Drawn By BTW	
Checked By BP	Sheet 9 of 9

LANGAN
PROJECT NO. 140148202

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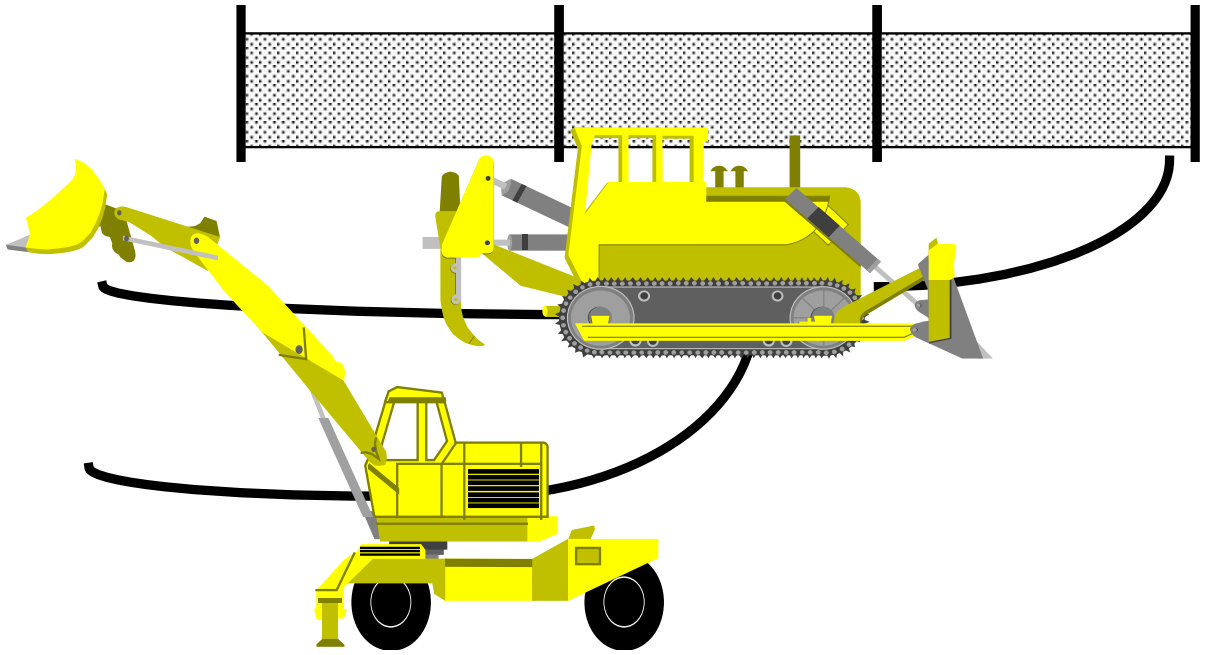
APPENDIX A

GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS ASSOCIATED WITH CONSTRUCTION ACTIVITIES

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities



Effective Date: December 31, 2020

Printed on recycled paper

General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Table of Contents

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Section 1. Authority

This general permit is issued under the authority of section 22a-430b of the Connecticut General Statutes.

Section 2. Definitions

The definitions of terms used in this general permit shall be the same as the definitions contained in section 22a-423 of the Connecticut General Statutes and section 22a-430-3(a) of the Regulations of Connecticut State Agencies. All references to an Appendix in this general permit means the applicable Appendix of this general permit. As used in this general permit, the following definitions shall apply:

"*x-year, 24-hour rainfall event*" means the maximum 24-hour precipitation event with a probable recurrence interval of once in the given number of years (i.e. x=2, 25 or 100), as defined by the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 10, Version 2, Point Precipitation Frequency Estimates (as amended), or equivalent regional or state rainfall probability information developed therefrom.

"*Annual sediment load*" means the total amount of sediment carried by stormwater runoff on an annualized basis.

"*Aquifer protection area*" has the same meaning as provided in section 22a-354h of the Connecticut General Statutes.

"*Best engineering practices*" means the design of engineered control measures to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable.

"*CFR*" means the Code of Federal Regulations.

"*Coastal area*" means coastal area as defined in section 22a-93(3) of the Connecticut General Statutes.

"*Coastal waters*" means coastal waters as defined in section 22a-93(5) of the Connecticut General Statutes.

"*Commissioner*" means the Commissioner of Energy and Environmental Protection or the Commissioner's designee.

"*Construction activity*" means any activity and discharges associated with construction at a site or the site's preparation for construction, including, but not limited to, clearing, grubbing, pile driving, soil disturbance, soil compaction by construction equipment, staging and stockpiling, cleaning and washout, grading, excavation, and dewatering.

"*DOT"* means the State of Connecticut Department of Transportation.

"*Department*" means the Department of Energy and Environmental Protection.

"*Designing qualified professional*" means the qualified professional engineer or qualified soil erosion and sediment control professional, as defined below, who developed the original Stormwater Pollution Control Plan for which authorization was granted under this general permit.

"*Developer*" means a person who or municipality which is responsible, either solely or partially through contract, for the design and construction of a project site.

"*Dewatering wastewater*" means wastewater associated with the construction activity generated from the lowering of the groundwater table, the pumping of accumulated stormwater or uncontaminated groundwater from an excavation, the pumping of surface water from a cofferdam, or pumping of other surface water that has been diverted into a construction site.

"*District*" means a soil and water conservation district established pursuant to section 22a-315 of the Connecticut General Statutes. Appendices E and F list the Districts, their geographic delineations, and contact information.

"*Disturbance*" means the area on a site where soil will be exposed or susceptible to erosion during any construction activity.

"*Effective Impervious Cover*" is the area of impervious cover that is hydraulically connected to a water or wetland by means of continuous paved surfaces, gutters, swales, ditches, drain pipes or other conventional conveyance and detention structures that do not reduce runoff volume. Impervious cover is a surface composed of any material that impedes or prevents infiltration of water into the soil. Impervious surfaces shall include, but are not limited to, roofs, solid decks, driveways, patios, sidewalks, parking areas, tennis courts, concrete or asphalt streets, or compacted soils or compacted gravel surfaces.

"*Engineered stormwater management system*" means any control measure and related appurtenances which requires engineering analysis and/or design by a professional engineer.

"*Erosion*" means the detachment and movement of soil or rock fragments by water, wind, ice and gravity.

"*Final stabilization*" for a site authorized by this general permit means that no disturbed areas remain exposed, there is no active erosion or sedimentation present on the site, and that vegetation or permanent non-vegetative ground cover, as specified in the Permittee's Plan, have been fully established over the entire site.

"*Fresh-tidal wetland*" means a tidal wetland with an average salinity level of less than 0.5 parts per thousand.

"*General Permit*" means the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities issued by the Commissioner effective on December 31, 2020.

"*Groundwater*" means those waters of the state that naturally exist or flow below the surface of the ground.

"*Guidelines*" means the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, established pursuant to section 22a-328 of the Connecticut General Statutes.

"*High Quality Waters*" means those waters defined as high quality waters in RCSA 22a-426-1, as may be amended.

"*Impaired water(s)*" means those surface waters of the state designated by the commissioner as impaired pursuant to Section 303(d) of the Clean Water Act and as identified in the most recent State of Connecticut Integrated Water Quality Report.

"*In Responsible charge*" means professional experience for which the Commissioner determines that a professional's primary duties consistently involve a high level of responsibility and decision making in the planning and designing of engineered stormwater management systems or in the planning and designing of soil erosion and sediment controls for residential and commercial construction projects. The Commissioner

shall consider the following in determining whether a professional's experience qualifies as responsible charge experience:

(i) the level of independent decision-making exercised;

(ii) the number of individuals and the disciplines of the other professionals that the professional supervised or coordinated;

(iii) the extent to which a professional's responsibilities consistently involved the review of work performed by other professionals involved the planning and designing of engineered stormwater management systems or the planning and designing of soil erosion and sediment controls for residential and commercial construction projects;

(iv) the extent to which a professional's responsibilities consistently involved the planning and designing of engineered stormwater management systems or the planning and designing of soil erosion and sediment controls for residential and commercial construction projects and whether such responsibilities were an integral and substantial component of the professional's position;

(v) the nature of a professional's employer's primary business interests and the relation of those interests to planning and designing of engineered stormwater management systems or to planning and designing of soil erosion and sediment controls for residential and commercial construction projects;

(vi) the extent to which a professional has engaged in the evaluation and selection of scientific or technical methodologies for planning and designing of engineered stormwater management systems or for planning and designing of soil erosion and sediment controls for residential and commercial construction projects;

(vii) the extent to which a professional drew technical conclusions, made recommendations, and issued opinions based on the results of planning and designing of engineered stormwater management systems or of planning and designing of soil erosion and sediment controls for residential and commercial construction projects; or

(viii) any other factor that the Commissioner deems relevant.

"*Individual permit*" means a permit issued to a specific permittee under section 22a-430 of the Connecticut General Statutes.

"*Inland wetland*" means wetlands as defined in section 22a-38 of the Connecticut General Statutes.

"*Landscape Architect*" means a person with a currently effective license issued in accordance with chapter 396 of the Connecticut General Statutes.

"*Linear Project*" includes the construction of roads, railways, bridges, bikeways, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

"*Locally approvable project*" means a construction activity for which the registration is not for a municipal, state or federal project and is required to obtain municipal approval for the project.

"*Locally exempt project*" means a construction activity for which a registration is required under this general permit and which is not a locally approvable project.

"*Low Impact Development*" or "*LID*" means a site design strategy that maintains, mimics or replicates pre-development hydrology through the use of numerous site design principles and small-scale treatment practices distributed throughout a site to manage runoff volume and water quality at the source.

"*Minimize*", for purposes of implementing the control measures in Section 5(*b*)(2) of this general permit, means to reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.

"*Municipal separate storm sewer system*" or "*MS4*" means conveyances for stormwater (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) owned or operated by any municipality, DOT or by any other state or federal institution (as defined in the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems) and discharging to surface waters of the state.

"*Municipality*" has the same meaning as provided in section 22a-423 of the Connecticut General Statutes.

"*Normal Working Hours*" are considered to be, at a minimum, Monday through Friday, between the hours of 8:00 am and 6:00 pm, unless additional working hours are specified by the permittee.

"*Permittee*" means any person who or municipality which initiates, creates or maintains a discharge in accordance with Section 3 of this general permit.

"*Person*" means person as defined in section 22a-423 of the Connecticut General Statutes.

"*Phase*" means a portion of a project possessing a distinct and complete set of activities that have a specific functional goal wherein the work to be completed in the phase is not dependent upon the execution of work in a later phase in order to make it functional.

"*Point Source*" means any discernible, confined and discrete stormwater conveyance (including but not limited to, any pipe, ditch, channel, tunnel, conduit, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft) from which pollutants are or may be discharged.

"*Professional Engineer*" or "*P.E.*" means a person with a currently effective license issued in accordance with chapter 391 of the Connecticut General Statutes.

"*Qualified Inspector*" means an individual possessing either (1) a professional license or certification by a professional organization recognized by the commissioner related to agronomy, civil engineering, landscape architecture, soil science, and two years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (2) five years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (3) certification by the DOT. For purposes of solar array projects, a Qualified Inspector shall be selected as specified in Appendix I of the general permit.

"*Qualified professional engineer*" means a professional engineer who has, for a minimum of eight years, engaged in the planning and designing of engineered stormwater management systems for residential and commercial construction projects in accordance with the Guidelines and the Stormwater Quality Manual including, but not limited to, a minimum of four years in responsible charge of the planning and designing of engineered stormwater management systems for such projects. Such qualified professional engineer shall remain in good standing with the Connecticut Department of Consumer Protection and the Commissioner.

"*Qualified soil erosion and sediment control professional*" means a landscape architect or a professional engineer who: (1) has for a minimum of eight years engaged in the planning and designing of soil erosion and sediment controls for residential and commercial construction projects in accordance with the Guidelines including, but not limited to, a minimum of four years in responsible charge of the planning and designing of soil erosion and sediment controls for such projects; or (2) is currently certified as a professional in erosion and sediment control as designated by EnviroCert International, Incorporated (or other certifying organization acceptable to the commissioner) and has, for a minimum of six years, engaged in the planning and designing of soil erosion and sediment controls for residential and commercial construction projects in accordance with the Guidelines including, but not limited to, a minimum of four years in responsible charge in the planning and designing of soil erosion and sediment controls for such projects. Such qualified soil erosion and sediment control professional shall remain in good standing with the Connecticut Department of Consumer Protection and the Commissioner.

"*Registrant*" means a person or municipality that files a registration.

"*Registration*" means a registration filed with the commissioner pursuant to Section 4 of this general permit.

"*Regulated Municipal Separate Storm Sewer System*" or "*Regulated MS4*" means any MS4 (as defined above) authorized by the most recently issued General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems, as well as the separate storm sewer system of the DOT and the City of Stamford including all those located partially or entirely within an Urbanized Area and those additional MS4s located outside an Urbanized Area as may be designated by the commissioner.

"*Retain*" means to hold runoff on-site to promote vegetative uptake and groundwater recharge through the use of runoff reduction or LID practices or other measures. In addition, it means there shall be no subsequent point source release to surface waters from a storm event defined in this general permit or as approved by the commissioner.

"*Runoff reduction practices*" means those post-construction stormwater management practices used to reduce post-development runoff volume delivered to the receiving water, as defined by retaining the volume of runoff from a storm up to the first half inch or one inch of rainfall. Runoff reduction is quantified as the total annual post-development runoff volume reduced through canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration or evapo-transpiration.

"*Sediment*" means solid material, either mineral or organic, that is in suspension, is transported, or has been moved from its site of origin by erosion.

"*Site*" means geographically contiguous land on which a construction activity takes place or on which a construction activity for which authorization is sought under this general permit is proposed to take place. Non-contiguous land or water owned by the same person shall be deemed the same site if such land is part of a linear project (as defined in this section) or is otherwise connected by a right-of-way, which such person controls.

"*Soil*" means any unconsolidated mineral and organic material of any origin.

"*Soil Scientist*" shall be as defined in Conn. Gen. Stat. § 22a-38.

"*Solar array*" means an on-the-ground installation of arrays of photovoltaic cell panels, supporting structures and related equipment for the production of electricity.

"*Stabilize"* means the use of measures as outlined in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, or as approved by the commissioner, to prevent the visible movement of soil particles and development of rills.

"*Standard of care*", as used in Section 3(*b*), means to endeavor to perform in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances.

"*Structural measure*" means a measure constructed for the temporary storage and/or treatment of stormwater runoff.

"*Stormwater*" means waters consisting of rainfall runoff, including snow or ice melt during a rain event.

"*Stormwater Pollution Control Plan*", "*SWPCC*", or "*Plan*" means the stormwater pollution control plan required under Section 5(*b*) of the general permit and approved by Commissioner as part of the approval of a registration.

"*Stormwater Quality Manual*" means the 2004 Connecticut Stormwater Quality Manual published by the Connecticut Department of Energy & Environmental Protection, as amended.

"*Surface water*" means that portion of waters, as the term "waters" is defined in section 22a-423 of the Connecticut General Statutes, located above the ground surface.

"*Tidal wetland*" means a wetland as that term is defined in section 22a-29(2) of the Connecticut General Statutes.

"*Total disturbance*" means the total area of disturbance on a site during all phases of construction activity.

"*Total Maximum Daily Load*" or "*TMDL*" means the maximum capacity of a surface water to assimilate a pollutant as established by the commissioner, including pollutants contributed by point and non-point sources and a margin of safety.

"*Upland soils*" means soils which are not designated as poorly drained, very poorly drained, alluvial, or flood plain by the National Cooperative Soils Survey, as may be amended, of the Natural Resources Conservation Service of the United States Department of Agriculture and/or the inland wetlands agency of the municipality in which the project will take place.

"*Water company*" means water company as defined in section 25-32a of the Connecticut General Statutes.

"*Waters*" shall be as defined in Conn. Gen. Stat. § 22a-423, and for clarification shall include vernal pools and intermittent waters.

"*Water Quality Standards*" means the water quality standards in RCSA 22a-426-1 et seq, and the classification maps adopted pursuant to section 22a-426 of the Connecticut General Statutes, as both may be amended.

"*Water Quality Volume*" or "*WQV*" means the volume of runoff generated by one inch of rainfall on a site as defined in the 2004 Connecticut Stormwater Quality Manual, as amended.

"*Wetland*" shall mean and include both "wetland" as defined in Conn. Gen. Stat. § 22a-29 and "wetlands" as defined in Conn. Gen. Stat. § 22a-38.

Section 3. Authorization Under This General Permit

(a) Eligible Activities

This general permit authorizes construction activities and associated stormwater and dewatering wastewater discharges on a site, as defined in this general permit, with a total disturbance of one or more acres of land area on a site, *regardless of project phasing*.

In the case of a larger plan of development (such as a subdivision), the estimate of total acres of site disturbance shall include, but is not limited to, road and utility construction, individual lot construction (e.g. house, driveway, septic system, etc.), and all other construction associated with the overall plan, regardless of the individual parties responsible for construction of these various elements.

(b) Requirements for Authorization

This general permit authorizes the construction activity and associated discharges listed in the "Eligible Activities" section (Section 3(*a*)) of this general permit provided:

(1) Coastal Management Act

Such construction activity must be consistent with all applicable goals and policies in section 22a-92 of the Connecticut General Statutes, and must not cause adverse impacts to coastal resources as defined in section 22a-93(15) of the Connecticut General Statutes. Please refer to the Appendix D for additional guidance.

(2) Endangered and Threatened Species

Such activity must not threaten the continued existence of any species listed pursuant to section 26-306 of the Connecticut General Statutes as endangered or threatened and must not result in the destruction or adverse modification of habitat designated as essential to such species. See Appendix A for conditions and requirements for compliance.

(3) Aquifer Protection Areas

Such construction activity, if it is located within an aquifer protection area as mapped under section 22a-354b of the General Statutes, must comply with regulations adopted pursuant to section 22a-354i of the General Statutes. Please refer to the Appendix C for additional guidance.

For any construction activity regulated pursuant to sections 22a-354i-8(c) and 9(b) of the Regulations of Connecticut State Agencies (Aquifer Protection Regulations), the Stormwater Pollution Control Plan (Plan) must assure that stormwater run-off generated from the regulated construction activity (i) is managed in a manner so as to prevent pollution of groundwater, and (ii) complies with all the requirements of this general permit.

(4) Mining Operations Exception

The stormwater discharge resulting from an activity classified by the Standard Industrial Classification 10 and 12 through 14 (the mining industry) is not eligible to be authorized by this general permit and is regulated under the most recently issued General Permit for the Discharge of Stormwater Associated with Industrial Activity.

(5) Discharge to POTW

The stormwater is *not* discharged to a Publicly Owned Treatment Works (POTW).

(6) Discharge to Groundwater

The stormwater is *not* discharged entirely to groundwater under all conditions before, during or after construction.

(7) Such construction activity must be consistent with the Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) for those river components and tributaries which have been designated as Wild and Scenic by the United States Congress. Further, such construction activities must not have a direct and adverse effect on the values for which such river designation was established. Please refer to Appendix H for additional guidance.

(8) Certification Requirements for Registrants and other Individuals

As part of the registration for this general permit, the registrant and any other individual or individuals responsible for preparing the registration submits to the commissioner a written certification which, at a minimum, complies with the following requirements:

(A) The registrant and any other individual or individuals responsible for preparing the registration and signing the certification has completely and thoroughly reviewed, at a minimum, this general permit and the following regarding the activities to be authorized under such general permit:

(i) all registration information provided in accordance with Section 4(*c*)(2) of such general permit;

(ii) the project site, based on a site inspection;

(iii) the Stormwater Pollution Control Plan; and

(iv) any plans and specifications and any Department approvals regarding such Stormwater Pollution Control Plan;

(B) The registrant and any other individual or individuals responsible for preparing the registration and signing the certification pursuant to this general permit has, based on the review described in section 3(*b*)(8)(A) of this general permit, made an affirmative determination to:

(i) comply with the terms and conditions of this general permit;

(ii) maintain compliance with all plans and documents prepared pursuant to this general permit including, but not limited to, the Stormwater Pollution Control Plan;

(iii) properly implement and maintain the elements of the Stormwater Pollution Control Plan; and

(iv) properly operate and maintain all stormwater management systems in compliance with the terms and conditions of this general permit to protect the waters of the state from pollution;

(C) Such registrant and any other individual or individuals responsible for preparing the registration certifies to the following statement: "I hereby certify that I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT

ADDRESS OF PROJECT OR ACTIVITY] and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify that I have made an affirmative determination in accordance with Section 3(*b*)(8)(B) of this general permit. I understand that the registration filed in connection with such general permit is submitted in accordance with and shall comply with the requirements of Section 22a-430b of Connecticut General Statutes. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(9) The registrant has submitted to the commissioner a written certification by a professional engineer or, where appropriate, a landscape architect licensed in the State of Connecticut for the preparation, planning and design of the Stormwater Pollution Control Plan ("Plan" or "SWPCP") and stormwater management systems:

The professional engineer or landscape architect shall certify to the following statement:

"I hereby certify that I am a [professional engineer][landscape architect] licensed in the State of Connecticut. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the project or activity covered by this certification. I further certify, based on such review and on the standard of care for such projects, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, the Stormwater Quality Manual, as amended, and the conditions of the general permit, and that the controls required for such Plan are appropriate for the site. I further certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement in this certification may subject me to sanction by the Department and/or be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(10) Plan Review and Certification by a District for Locally Approvable Projects

For locally approvable Plans not reviewed in accordance with Section 3(*b*)(11), below, the registrant has submitted to the commissioner a written certification by the appropriate regional District for the review of the Stormwater Pollution Control Plan pursuant to Appendix E, which, at a minimum, complies with the following requirements:

(A) the Plan Review Certification must be signed by the District. Information on the District review process is outlined in the Memorandum of Agreement provided in Appendix E. In cases where the District is unable to complete review of the Plan within the time limits

specified in the Memorandum of Agreement in Appendix E, a notice to that effect signed by the District may be submitted in lieu of the certification.

(B) the Stormwater Pollution Control Plan has been prepared in accordance with the requirements of Section 5(*b*) of the general permit.

(11) Plan Review and Certification by a Qualified Soil Erosion and Sediment Control Professional and Qualified Professional Engineer for Locally Approvable Projects

For those Plans not reviewed in accordance with Section 3(*b*)(10), above, the registrant has submitted to the commissioner a written certification by a qualified professional engineer or a qualified soil erosion and sediment control professional in accordance with the following requirements:

(A) for projects disturbing more than one acre and less than fifteen (15) acres, such qualified soil erosion and sediment control professional or qualified professional engineer:

(i) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant; and

(ii) has no ownership interest of any kind in the project for which the registration is being submitted.

(B) for projects disturbing fifteen (15) acres or more, such qualified soil erosion and sediment control professional or qualified professional engineer:

(i) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant;

(ii) did not engage in any activities associated with the preparation, planning, designing or engineering of such plan for soil erosion and sediment control or plan for stormwater management systems on behalf of such registrant;

(iii) is not under the same employ as any person who engaged in any activities associated with the preparation, planning, designing or engineering of such plans and specifications for soil erosion and sediment control or plans and specifications for stormwater management systems on behalf of such registrant; and

(iv) has no ownership interest of any kind in the project for which the registration is being submitted.

(C) The qualified professional engineer or qualified soil erosion and sediment control professional signing the certification has, at a minimum, completely and thoroughly reviewed this general permit and the following regarding the discharges to be authorized under such general permit:

(i) all registration information provided in accordance with Section 4(*c*)(1) of such general permit;

(ii) the site, based on a site inspection;

(iii) the Stormwater Pollution Control Plan;

(iv) the Guidelines;

(v) the Stormwater Quality Manual, if applicable; and

(vi) all non-engineered and engineered stormwater management systems, including any plans and specifications and any Department approvals regarding such stormwater management systems.

(D) Affirmative Determination

(i) The qualified soil erosion and sediment control professional signing the certification must have made an affirmative determination, based on the review described in section 3(*b*)(11)(C) of this general permit that:

(a) the Stormwater Pollution Control Plan prepared and certified pursuant to the registration is adequate to assure that the project or activity authorized under this general permit, if implemented in accordance with the Stormwater Pollution Control Plan, will comply with the terms and conditions of such general permit; and

(b) all non-engineered stormwater management systems:

(*1*) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual;

(*2*) will function properly as designed;

(*3*) are adequate to ensure compliance with the terms and conditions of this general permit; and

(*4*) will protect the waters of the state from pollution.

(ii) The qualified professional engineer signing the certification must have made an affirmative determination, based on the review described in section 3(*b*)(11)(C) of this general permit that:

(a) the Stormwater Pollution Control Plan prepared and certified pursuant to the registration is adequate to assure that the activity authorized under this general permit, if implemented in accordance with the Stormwater Pollution Control Plan, will comply with the terms and conditions of such general permit; and

(b) all non-engineered and engineered stormwater management systems:

(*1*) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual;

(*2*) will function properly as designed;

(*3*) are adequate to ensure compliance with the terms and conditions of this general permit; and

(*4*) will protect the waters of the state from pollution.

(E) The qualified professional engineer or qualified soil erosion and sediment control professional shall, provided it is true and accurate, certify to the following statement:

"I hereby certify that I am a qualified professional engineer or qualified soil erosion and sediment control professional, or both, as defined in the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and as further specified in sections 3(*b*)(11)(A) and (B) of such general permit. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(11)(C) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I further certify that I have made the affirmative determination in accordance with Sections 3(*b*)(11)(D)(i) and (ii) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(12) Plan Review and Certification for Projects Conducted by State Agencies

For projects conducted by a state agency (e.g. DOT, DAS, etc.), the registering agency has submitted to the commissioner a written certification by a qualified professional engineer or a qualified soil erosion and sediment control professional in accordance with the following requirements:

(A) the registering agency or another state agency has developed a process to establish a list of qualified professional engineers and qualified soil erosion and sediment control professionals for which the process to qualify has been approved in writing by the commissioner;

(B) the qualified professional engineer or qualified soil erosion and sediment control professional reviewing and certifying the Plan is included on the list prepared by a state agency and for which the process to establish the list has been approved by the commissioner pursuant to Section 3(*b*)(12)(A), above;

(C) the qualified professional engineer or qualified soil erosion and sediment control professional signing the certification has, at a minimum, completely and thoroughly reviewed this general permit and the following regarding the discharges to be authorized under such general permit:

(i) all registration information provided in accordance with Section 4(*c*)(2) of such general permit;

(ii) the site, based on a site inspection;

(iii) the Stormwater Pollution Control Plan;

(iv) the Guidelines;

(v) the Stormwater Quality Manual, if applicable; and

(vi) all non-engineered and engineered stormwater management systems, including any plans and specifications and any Department approvals regarding such stormwater management systems.

(D) Affirmative Determination

(i) The qualified soil erosion and sediment control professional signing the certification must have made an affirmative determination, based on the review described in section 3(*b*)(12)(C) of this general permit that:

(a) the Stormwater Pollution Control Plan prepared and certified pursuant to the registration is adequate to assure that the project or activity authorized under this general permit, if implemented in accordance with the Stormwater Pollution Control Plan, will comply with the terms and conditions of such general permit; and

(b) all non-engineered stormwater management systems:

(*1*) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual;

(*2*) will function properly as designed;

(*3*) are adequate to ensure compliance with the terms and conditions of this general permit; and

(*4*) will protect the waters of the state from pollution.

(ii) The qualified professional engineer signing the certification must have made an affirmative determination, based on the review described in section 3(*b*)(12)(C) of this general permit that:

(a) the Stormwater Pollution Control Plan prepared and certified pursuant to the registration is adequate to assure that the activity authorized under this general permit, if implemented in accordance with the Stormwater Pollution Control Plan, will comply with the terms and conditions of such general permit; and

(b) all non-engineered and engineered stormwater management systems:

(*1*) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual;

(*2*) will function properly as designed;

(*3*) are adequate to ensure compliance with the terms and conditions of this general permit; and

(*4*) will protect the waters of the state from pollution.

(E) The qualified professional engineer or qualified soil erosion and sediment control professional shall, provided it is true and accurate, certify to the following statement:

"I hereby certify that I am a qualified professional engineer or qualified soil erosion and sediment control professional, or both, as defined in the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and as further specified in sections 3(*b*)(12)(A) and (B) of such general permit. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(12)(C) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I further certify that I have made the affirmative determination in accordance with Sections 3(*b*)(12)(D)(i) and (ii) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(F) Projects conducted by a state agency under this subparagraph (Section 3(*b*)(12)) shall be submitted in accordance with the requirements in Sections 3(*c*), 3(*g*)(1)(B) and 4(*c*)(2)(A)(i).

(13) New Discharges to Impaired Waters

(A) For impaired waters identified in the State's most recent Integrated Water Quality Report, new stormwater discharges proposed in a registration submitted under this general permit that will discharge directly to such waters must comply with the requirements of (13)(B), below, if such report indicates the cause or potential cause of the impairment as one of the following:

(i) Site Clearance (Land Development or Redevelopment)

(ii) Post-Development Erosion and Sedimentation

(iii) Source Unknown (if cause of impairment is Sedimentation/Siltation)

(B) Such stormwater discharge is authorized if the permittee complies with the requirements of Section 5(*b*)(3) of this permit and receives a written affirmative determination from the commissioner that the discharge meets the requirements of that section. In such case, the permittee must keep a copy of the written determination onsite with the Plan. If the permittee does not receive such affirmative determination, the construction activity is not authorized by this general permit and must obtain an individual permit.

(14) Solar Arrays

For constructions activities associated with the development of a solar array that is locally exempt, as those respective terms are defined in Section 2, in addition to the other requirements of this general permit a Permittee shall also comply with the requirements in Appendix I.

(15) Cold Water Stream Habitat

A Permittee shall maintain a one-hundred (100) foot undisturbed buffer between any construction activity and any stream, river, or tributary that is included within a Cold Water Stream Habitat as defined at: https://portal.ct.gov/DEEP/Water/Inland-Water-Monitoring/Cold-Water-Stream-Habitat-Map. The buffer shall consist of undisturbed soil and well-established existing vegetation.

(16) Other Requirements for Authorization

The following requirements for authorization shall apply to all projects:

(A) Prior to commencement of any construction activity, the Permittee shall conduct a preconstruction meeting with the qualified professional who designed the project, the qualified inspector who will be conducting inspections, and all site contractors and subcontractors to be involved in construction. Such meeting shall convey the design, stormwater control measures, erosion and sediment controls, plan implementation and routine site inspections, and contract requirements for the project prior to earth disturbance. Such meeting shall also include a site walk of the project site. In the case of solar arrays and any other projects that may be reviewed and/or inspected by a District, the preconstruction meeting and site walk shall also include the appropriate District personnel. The Permittee shall ensure that the date of such meeting and a report summarizing the meeting shall be prepared and retained in the Permittee's Plan.

(B) The following contractor certification shall be signed by all contractors and subcontractors that will perform construction activities on the site that have the potential to cause pollution of the waters of the State:

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this general permit, and must comply with the terms and conditions of this general permit, including, but not limited to, the requirements of the Stormwater Pollution Control Plan prepared for the site."

Such signed certifications shall be maintained with the Plan on-site at all times.

(C) The designing qualified professional shall conduct the Plan Implementation Inspection(s) pursuant to Section 5(*b*)(4)(A) and shall submit such Plan Implementation Inspection report(s) to the commissioner confirming compliance with the general permit and proper initial implementation of all control measures designated in the Plan for the initial phase of construction. In the case of solar arrays and any other projects that may be reviewed and/or inspected by a District, the Plan Implementation Inspection(s) shall also include the appropriate District personnel.

(D) For locally approvable projects, the permittee shall indicate whether any financial assurance was required by the town in which the project is being conducted and, if so, indicate what type of assurance was required and in what amount.

(E) Nothing in this subsection or permit shall be construed to authorize District personnel, a qualified soil erosion and sediment control professional or a qualified professional engineer to engage in any profession or occupation requiring a license under any other provision of the general statutes without such license.

(F) Failure to comply with any provisions of Section 3(*b*)(16) is a violation of this general permit and shall be grounds for the commissioner to revoke authorization.

(G) Specific Provisions Applicable to Projects Conducted by State Agencies

(i) Permittee shall conduct a preconstruction meeting with the contractor that conveys the design, stormwater control measures, plan implementation and routine site inspections, erosion and sediment controls, and contract requirements for the project prior to earth disturbance. Such meeting shall include a site walk of the project site.

(ii) The DOT District Engineer, District Environmental Coordinator, or the designated employee of another state agency shall conduct the Plan Implementation Inspection(s) pursuant to Section 5(*b*)(4)(A) of the general permit and shall submit such Plan Implementation Inspection report(s) to the Commissioner confirming compliance with the general permit and proper initial implementation of all control measures designated in the Plan for the initial phase of construction.

(iii) The State is not required to provide evidence of financial assurance.

(c) Registration

Pursuant to the "Registration Requirements" section (Section 4) of this general permit, a completed registration with respect to the construction activity shall be filed with the commissioner.

(d) Small Construction

For construction projects with a total disturbance of between one and five acres, the permittee shall adhere to the erosion and sediment control land use regulations of the municipality in which the construction activity is conducted, as well as the Guidelines and the Stormwater Quality Manual.

No registration or Plan review and certification shall be required for such construction activity provided a land-use commission of the municipality (i.e. planning/zoning, wetland, conservation, etc) reviews and issues a written approval of the proposed erosion and sediment control measures, pursuant to the requirements of section 22a-329 of the Connecticut General Statutes. In the absence of a municipal commission to review and approve such activity, the permittee shall register with the DEEP under the requirements for a Locally Exempt Project and comply with all applicable conditions of this general permit.

(e) Geographic Area

This general permit applies throughout the State of Connecticut.

(f) Effective Date and Expiration Date of this General Permit

This General Permit shall be effective at 12:00 a.m. on December 31, 2020. The provisions of this General Permit shall expire as of 11:59 p.m. on December 30, 2025.

(g) Effective Date of Authorization

A construction activity is not authorized by this general permit unless a registration has been approved by the Commissioner and the following conditions have been met:

(1) General Timelines

(A) for locally approvable projects, sixty (60) days have elapsed after the submission of a complete and sufficient registration form required by Section 4(*c*) of the general permit, or

(B) for locally exempt projects with a total disturbed area of under fifteen (15) acres, sixty (60) days have elapsed after the submission of a complete and sufficient registration form required by Section 4(*c*), or

(C) for locally exempt projects with a total disturbed area equal to or more than fifteen (15) acres, ninety (90) days have elapsed after the submission of a complete and sufficient registration form required by Section 4(*c*) of the general permit.

(2) Exceptions to Authorization Timelines

If one of the following conditions applies, that condition shall supersede those of subsection (1), above:

(A) for sites for which the registration and Plan availability and review provisions of Section 4(*e*) of the general permit are completed prior to the elapse of the authorization periods in subdivision (1), above, the commissioner may authorize the activity upon such completion, or

(B) for sites for which the conditions of Section 3(*b*)(2), 3(*b*)(13) or Section 5(*a*)(2) of the general permit apply, the activity is authorized only upon the date of the commissioner's affirmative determination and/or approval of a registration, or

(C) for sites authorized by any previous version of this general permit and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" of that general permit, the activity is authorized effective December 31, 2020. Authorization under this general permit shall cease if a re-registration form is not submitted within one hundred twenty (120) days of the effective date of this general permit.

(h) Revocation of an Individual Permit

No person shall seek authorization under this general permit for a construction activity authorized by an individual permit. If a construction activity is eligible for authorization under this general permit and such activity is presently authorized by an individual permit, the existing individual permit may be revoked by the commissioner upon a written request by the permittee. If the commissioner revokes such individual permit in writing, such revocation shall take effect on the effective date of authorization of such activity under this general permit.

(i) Issuance of an Individual Permit

If the commissioner issues an individual permit under section 22a-430 of the Connecticut General Statutes, authorizing a construction activity authorized by this general permit, this general permit shall cease to authorize that activity beginning on the date such individual permit is issued.

Section 4. Registration Requirements

(a) Who Must File a Registration

With the exception noted in the "Small Construction" section (Section 3(*d*)) of this general permit, any person or municipality which initiates, creates, originates or maintains a discharge described in the "Eligible Activities" section (Section 3(*a*)) of this general permit shall file with the commissioner a registration form (or, for existing permittees, a re-registration form) that meets the requirements of the "Contents of Registration" section (Section 4(*d*)) of this general permit (or a re-registration form) and the applicable fee within the timeframes and in the amounts specified in Sections 4(*c*) and 4(*d*)(1)(A), respectively. Any such person or municipality filing a registration remains responsible for maintaining compliance with this general permit.

(b) Scope of Registration

Each registration shall be limited to the discharge at or from one site; no registration shall cover discharges at or from more than one site.

(c) Registration Procedure

(1) Locally Approvable Projects

The registration must:

(A) Be electronically submitted, along with all required elements in subsections (B) through (E), below, at least sixty (60) days prior to the planned commencement of the construction activity. Failure to include any of these required submissions shall, among other potential reasons, be grounds to reject the registration.

(B) Include the electronic Registration Form (available at www.ct.gov/deep/stormwater).

(C) Include any additional forms and information that may be required pursuant to the "Requirements for Authorization" section (Section 3(*b*) of the general permit) regarding compliance and/or consistency with the Coastal Management Act, Impaired Waters (including TMDL requirements), Endangered and Threatened Species, and Aquifer Protection Areas.

(D) Include an electronic copy of the Stormwater Pollution Control Plan. The electronic Plan shall be in Adobe™ PDF format or similar publicly available format in common use. **DO NOT INCLUDE** in this electronic copy any pages or other material that do not pertain to stormwater management or erosion and sediment control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.).

(E) Include a Plan Review Certification in accordance with the plan review certification requirements of either Section 5(*b*)(10) or 5(*b*)(11) of the general permit.

(2) Locally Exempt Projects

The registration must be electronically submitted, along with all required elements in subsections (B), (C) and (D) of this section. The sixty (60) or ninety (90) day periods cited in subparagraph (A) of this subdivision shall not begin until all required elements have been submitted. Failure to include any of these required submissions shall be grounds to reject the registration. A registration shall:

(A) Be submitted at least:

(i) sixty (60) days prior to the planned commencement of the construction activity if the site has a total disturbance of between one (1) and fifteen (15) acres; ***or***

(ii) ninety (90) days prior to the planned commencement of construction activity if the site:

(a) has a total disturbance greater than fifteen (15) acres;

(b) discharges to a tidal wetland (that is not a fresh-tidal wetland) within 500 feet of the discharge point; ***or***

(c) is subject to the impaired waters provisions of Section 3(*b*)(13) of the general permit.

(B) Include the electronic Registration Form (available at www.ct.gov/deep/stormwater).

(C) Include any additional forms and information that may be required pursuant to Section 3(*b*)) of the general permit, "Requirements of Authorization", regarding compliance and/or consistency with the Coastal Management Act, Impaired Waters (including TMDL requirements), Endangered and Threatened Species, Solar Array provisions and Aquifer Protection.

(D) Include an electronic copy of the Stormwater Pollution Control Plan (Plan) (or a web address where the electronic Plan can be downloaded) for the commissioner's review. The electronic Plan shall be in Adobe™ PDF format or similar publicly available format in common use. **DO NOT INCLUDE** in this electronic copy any pages or other material that do not pertain to stormwater management or erosion and sediment control (such as electrical and lighting plans, A-2 boundary or similar lot surveys, building plans, non-stormwater related detail sheets, etc.).

(3) Re-Registration of Existing Projects

(A) *Re-Registration*. In order for discharges to continue to be authorized, a Permittee with a registration previously approved by the Commissioner under any previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" of that general permit shall submit a re-registration. Any such registration shall:

(i) be submitted no later than one hundred twenty (120) days after the effective date of this general permit using an electronic Re-Registration Form (available at www.ct.gov/deep/stormwater) pursuant to Section 4(*c*)(3) of the general permit; and

(ii) be accompanied by the fee set forth in Section 4(*d*)(1)(A)(iii) of the general permit unless that section provides for the waiver of such fee. Resubmission of a Permittee's Plan is not required with a re-registration provided, however, that such Plan shall be provided to, if requested by, the commissioner. Such Plan shall be provided within the time frame provided for in any request, or if no timeframe is provided, within thirty (30) days of the date of any such request.

(B) *Existing Projects that are not re-registered.* Discharges at or emanating from a site, for a Permittee with a registration previously approved by the Commissioner, that is not re-registered in accordance with this section shall no longer be authorized. Any re-registration

received more than one hundred twenty (120) days after the effective date of this general permit shall be considered to be a new registration, and shall not be eligible for any exemption from, or waiver of, any condition or requirement of this general permit, as specified in this section, and shall instead be required to comply with this general permit as if it were a new project, i.e., a project that had not been previously registered.

(C) *Exemption for Existing Projects Upon Re-Registration.* A Permittee that submits a re-registration in compliance with this section shall, except as provided in this section, comply with the terms and conditions of this general permit, including, but not limited to, the Plan in effect for the site. Any such Permittee shall be exempt from compliance with Sections 3(*b*)(15) and 5(*b*)(2)(D)(vi) of this general permit and, for a Permittee submitting a re-registration for construction of a solar array, shall be exempt from paragraphs (1) and (2) of Section I, Design and Construction requirements, in Appendix I and Section II, Design requirements for post-constriction stormwater management measures in Appendix I.

Note: For clarification purposes, the provisions of this general permit, including any updates to a Permittee's Plan, shall not apply retroactively to construction activities that may have already commenced – or been completed - before a Permittee submits a re-registration pursuant to section 4(*c*)(3) of this general permit. For example, the plan implementation inspections required by Section 5(*b*)(4)(A) of this general permit would not be applicable to a phase of construction already begun at the time a re-registration is submitted. By contrast, compliance with those same plan implementation inspection requirements would be required for each phase of construction that commences after a re-registration is submitted.

(4) Latest Date for New Registrations

Unless another date is specified by the Commissioner on the Department's Internet website (www.ct.gov/deep/stormwater), no person shall submit a registration under this general permit on or after October 1, 2025.

(d) Contents of Registration

(1) Fees

(A) Registration Fee

A registration, if required, shall not be deemed complete unless the registration fee has been paid in full.

(i) Locally Approvable Projects

A registration fee of $625.00 shall be submitted to the Department with the registration form.

(ii) Locally Exempt Projects

A registration fee shall be submitted with a registration form as follows:

(a) For sites with total disturbance of one (1) or more acres, but less than fifteen (15) acres, the fee shall be $3,000.

(b) For sites with total disturbance equal to or greater than fifteen (15) acres and less than fifty (50) acres, the fee shall be $4,000.

(c) For sites with total disturbance equal to or greater than fifty (50) acres, the fee shall be $5,000.

The fees for municipalities shall be half of those indicated in subsections (a), (b) and (c) above pursuant to section 22a-6(b) of the Connecticut General Statutes. State and Federal agencies shall pay the full fees specified in this subsection.

(iii) Re-registration

(a) For sites that registered under the previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities prior to August 1, 2019 and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), the re-registration fee shall be $625 payable with submission of the re-registration form within one hundred twenty (120) days from the effective date of this general permit. If a Notice of Termination is submitted prior to January 1, 2020, no re-registration or associated fee are required.

(b) For sites that registered under the previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities on or after August 1, 2019 and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), the permittee shall re-register and there is no re-registration fee.

(B) The registration fee shall be paid electronically or by check or money order payable to the Department of Energy & Environmental Protection in accordance with the instructions on the registration form.

(C) The registration fee is non-refundable.

(2) Registration Form

A registration shall be filed electronically on forms prescribed and provided by the commissioner (available at: www.ct.gov/deep/stormwater).

A registration shall include, but not be limited to, the following:

(A) Legal name, address, email address, and telephone number of the registrant. If the registrant is a person (as defined in Section 2 of this permit) transacting business in Connecticut and is registered with the Connecticut Secretary of the State, provide the exact name as registered with the Connecticut Secretary of the State.

(B) Legal name, address, email address, and telephone number of the owner of the property on which the construction activity will take place.

(C) Legal name, address, email address, and telephone number of the primary contact for departmental correspondence and inquiries, if different from the registrant.

(D) Legal name, address, email address, and telephone number of the developer of the property on which the construction activity is to take place.

(E) Legal name, address, email address, and daytime and off-hours telephone numbers of the general contractor(s) or other representative(s), if different from the developer.

(F) Legal name, address, email address, and telephone number of any consultant(s), engineer(s) or landscape architect(s) retained by the permittee to prepare the registration and Stormwater Pollution Control Plan.

(G) Location address or description of the site for which the registration is filed.

(H) The estimated duration of the construction activity.

(I) Indication of the normal working hours at the site.

(J) A brief description of the construction activity, including, but not limited to:

(i) Total number of acres to be disturbed, regardless of phasing.

(ii) Verification that construction is in accordance with the Guidelines and local erosion and sediment control ordinances, where applicable.

(iii) For sites in the Coastal Boundary, documentation that the DEEP Office of Long Island Sound Programs or local governing authority has issued a coastal site plan approval or a determination that the project is exempt from coastal site plan review (see Appendix D) in accordance with section 22a-92 and 22a-93(15) of the Connecticut General Statutes.

(iv) Documentation that the construction activity will not threaten the continued existence of any species listed pursuant to section 26-306 of the Connecticut General Statutes as endangered or threatened and will not result in the destruction or adverse modification of habitat designated as essential to such species (see Appendix A).

(v) For sites discharging to certain impaired waters, as specified in Section 3(*b*)(13) of the general permit, documentation that the construction activity meets the requirements of that section and Section 5(*b*)(3) of the general permit for authorization under this general permit.

(vi) Verification that the construction activity is not located within an aquifer protection area (see Appendix C) as mapped under section 22a-354b of the Connecticut General Statutes or, if it is located within an aquifer protection area, that the construction activity will comply with regulations adopted pursuant to section 22a-354i of the Connecticut General Statutes.

(vii) For a proposed locally approvable project, a plan review certification from the appropriate District, qualified soil erosion and sediment control professional, and/or qualified professional engineer in accordance with Section 5(*b*)(10) or (11) or a notice from the District that they were unable to complete the Plan review within the time limits specified in the Memorandum of Agreement in Appendix E.

(K) A brief description of the stormwater discharge, including:

(i) The name of the municipal separate storm sewer system or immediate surface water body or wetland to which the stormwater runoff will discharge;

(ii) Verification of whether or not the site discharges to a tidal wetland (that is not a fresh-tidal wetland) within 500 feet of the discharge point, to a high quality water or to an impaired water with or without a TMDL;

(iii) The name of the watershed or nearest waterbody to which the site discharges.

(iv) Location of the stormwater discharge(s) including latitude and longitude.

(L) The total effective impervious cover for the site before and after the proposed construction activity.

(M) Documentation that the proposed construction activity has been reviewed for consistency with state Historic Preservation statutes, regulations, and policies including identification of any potential impacts on property listed or eligible for listing on the Connecticut Register of Historic Places. A review conducted for an Army Corps of Engineers Section 404 wetland permit would meet this qualification. Refer to Appendix G for guidance on conducting the required review.

(N) An electronic copy of their Plan. The electronic Plan shall be in Adobe™ PDF format or similar publicly available format in common use. **DO NOT INCLUDE** in this Plan any pages or other material that do not pertain to stormwater management or erosion and sediment control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.).

(O) The certification of the registrant and of the individual or individuals responsible for actually preparing the registration, in accordance with Section 3(*b*)(8) of the general permit.

(P) A design certification must be signed by a professional engineer or, where appropriate, a landscape architect in accordance with Section 3(*b*)(9) of the general permit.

(Q) For registrations for locally approvable projects a review certification must be signed by either: (i) a District representative in accordance with Section 3(*b*)(10) of the general permit, or (ii) a qualified soil erosion and sediment control professional and/or qualified professional engineer in accordance with either Section 3(*b*)(11) of the general permit.

If the registrant is not capable of submitting electronically, contact the DEEP stormwater staff at DEEP.stormwaterstaff@ct.gov.

(3) Re-Registration Form

For sites previously registered under any previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" in Section 6 of the general permit, a re-registration is required. Such re-registration shall be filed electronically on forms prescribed and provided by the commissioner (available at: www.ct.gov/deep/stormwater) and shall include, but not be limited to, the following:

(A) Legal name, address, email address, and telephone number of the registrant. If the registrant is a person transacting business in Connecticut and is registered with the Connecticut Secretary of the State, provide the exact name as registered with the Connecticut Secretary of the State.

(B) The previously issued permit number (beginning with GSN).

(C) Legal name, address, email address, and telephone number of the owner of the property on which the construction activity will take place.

(D) Legal name, address, email address, and telephone number of the primary contact for departmental correspondence and inquiries, if different from the registrant.

(E) Legal name, address, email address, and telephone number of the developer of the property on which the subject construction activity is to take place.

(F) Legal name, address, email address, and daytime and off-hours telephone numbers of the general contractor(s) or other representative(s), if different from the developer.

(G) Legal name, address, email address, and telephone number of any consultant(s) or engineer(s) retained by the permittee to prepare the registration and Stormwater Pollution Control Plan.

(H) Location address or description of the site for which the re-registration is filed.

(I) Indication of the normal working hours at the site.

(J) The estimated duration of the construction activity.

(K) The signature of the registrant and of the individual or individuals responsible for actually preparing the re-registration, each of who shall certify in writing as follows:

"I hereby certify that I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY] and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that all designs and plans for such activity meet the current terms and conditions of the general permit in accordance with Section 5(b)(5)(C) of such general permit and that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(e) How to Submit a Registration

A registration or re-registration (available at: www.ct.gov/deep/stormwater) shall be filed electronically with the commissioner in accordance with Section 4(*d*)(2) or (3) of the general permit. If a permittee is not capable of submitting electronically, contact the DEEP stormwater staff at DEEP.stormwaterstaff@ct.gov.

(f) Availability of Registration and Plan

The commissioner shall post on the DEEP website a list of registrations submitted. Plans will be posted electronically with the corresponding registration. On or before thirty (30) days from the date such registration is accessible to the public through posting by the commissioner, members of the public may review and comment on a registration and/or Plan. This provision shall not apply to Permittee's submitting a re-registration for sites registered under any previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" in Section 6 of the general permit.

(g) Additional Information

The commissioner may require a Permittee to submit additional information that the commissioner deems necessary to evaluate compliance of the subject construction activity with the requirements for authorization under this general permit.

(h) Additional Notification

(1) No later than five (5) days after submitting a registration to the commissioner, the Permittee shall provide the following additional notifications:

(A) For discharges authorized by this general permit to a regulated municipal separate storm sewer system, a notification that a registration has been submitted to the Department shall also be submitted to the owner and operator of that system.

(B) For discharges authorized by this general permit to a DOT separate storm sewer system, a copy of the registration and all attachments thereto shall also be submitted to the DOT upon request.

(C) For discharges within a public drinking water supply watershed or aquifer protection area, a copy of the registration and the Plan described in subsection 5(*b*) of this general permit shall be submitted to the water company.

(D) For discharges to river components and tributaries which have been designated as Wild and Scenic under the Wild and Scenic Rivers Act, a copy of the registration and the Plan described in 5(*b*) of this general permit shall be submitted to the applicable Wild and Scenic Coordinating Committee. Please refer to Appendix H for additional guidance.

(2) The Permittee shall ensure that a copy of the registration submitted to the Commissioner and the Plan shall be available upon request to the local inland wetlands agency established pursuant to section 22a-42 of the Connecticut General Statutes, or its duly authorized agent.

(i) Action by Commissioner

(1) The commissioner may reject without prejudice a registration that the commissioner deems insufficient. For example, if it does not satisfy the requirements of the "Contents of Registration" section (subsection 4(*d*)) of this general permit. Any registration refiled after such a rejection shall be accompanied by the fee specified in the "Fees" subsection (subsection 4(*d*)(1)) of this general permit.

(2) The commissioner may disapprove a registration if it does not comply with the requirements of this general permit or for any other reason provided for by law. For example, if it is inconsistent with the requirements for authorization under the "Requirements for Authorization" section

(Section 3(*b*)) of this general permit, or an individual permit is required pursuant to Conn. Gen. Stat. § 22a-430b(c). Disapproval of a registration under this subsection shall constitute notice to the registrant that the subject construction activity must be authorized under an individual permit.

(3) Rejection or disapproval of a registration by the commissioner shall be in writing and state the reasons for such rejection or disapproval.

(4) Pursuant to Conn. Gen. Stat. § 22a-430b(c), the commissioner may require that a person or municipality obtain an individual permit, in which case, such person or municipality will be ineligible for authorization under this general permit.

(5) When approving a registration, the commissioner may include in any such approval any term or condition the commissioner deems necessary to protect human health and the environment..

Section 5. Conditions of this General Permit

The permittee shall comply with all of the requirements of this general permit at all times. In addition, a permittee shall be responsible for conducting authorized construction activities in accordance with the following conditions:

(a) General Conditions

(1) Structures and Dredging in Coastal and Tidal Areas

Any person who or municipality that discharges stormwater into coastal tidal waters for which a permit is required under section 22a-361 of the Connecticut General Statutes (structures and dredging) or section 22a-32 of the Connecticut General Statutes (Tidal Wetlands Act), shall obtain such permit(s) from the commissioner. A tidal wetland permit is required for any regulated activity conducted within a tidal wetland, including, but no limited to, the placement of any sediment upon a tidal wetland, whether it is deposited directly or indirectly.

(2) Discharges to Tidal Wetlands

Any site which has a post-construction stormwater discharge to a tidal wetland (that is not a fresh-tidal wetland) where such discharge is within 500 feet of the tidal wetland, shall discharge such stormwater through a system designed to retain and infiltrate the volume of stormwater runoff generated by 1 inch of rainfall on the site. If there are site constraints that would prevent retention of this volume on-site (e.g., brownfields, capped landfills, bedrock, elevated groundwater, etc.), documentation must be submitted, for the commissioner's review and written approval, which explains the site limitations and offers an alternative retention volume. In such cases, the portion of 1 inch that cannot be retained must be provided with additional stormwater treatment so as to protect water quality. Any such treatment shall be designed, installed and maintained in accordance with the Stormwater Quality Manual.

For sites unable to comply with this section, the commissioner, at the commissioner's sole discretion, may require the submission of an individual permit in lieu of authorization under this general permit.

(3) Toxicity to Aquatic and Marine Life/Risk to Human Health

Any discharge authorized under this general permit shall not cause pollution due to acute or chronic toxicity to aquatic and marine life, impair the biological integrity of aquatic or marine ecosystems, or result in an unacceptable risk to human health.

(4) Water Quality Standards

Any discharge authorized under this general permit shall not cause or contribute to an exceedance of the applicable Water Quality Standards in the receiving water.

(5) High Quality Waters

Any new or increased discharge authorized under this general permit to high quality waters shall be discharged in accordance with the Anti-Degradation Implementation requirements in the Water Quality Standards, section 22a-426-8 of RCSA.

(b) Stormwater Pollution Control Plan

All Permittees shall develop and maintain on-site a Stormwater Pollution Control Plan ("Plan" or "SWPCP") for the construction activity authorized by this general permit. Once the construction activity begins, the permittee shall perform all actions required by such Plan and shall maintain compliance with the Plan at all times. The permittee shall ensure that the design and implementation of the Plan minimizes: (1) soil erosion and sedimentation during and after construction; and (2) stormwater pollution from the site after construction is completed.

(1) Development and Contents of Plan

(A) The Plan shall consist of site plan drawings and a narrative. The Plan shall be prepared in accordance with sound engineering practices, and shall be consistent with the Guidelines, the Stormwater Quality Manual (available at http://www.ct.gov/deep/stormwater) and any applicable requirements of this general permit. The Plan shall also be consistent with any remedial action plan, closure plan or other plan required by any other DEEP permit.

(B) The Plan shall include, at a minimum, the following items:

(i) Site Plan

Site drawings indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, the location of major structural and non-structural controls (as specified in subsection 5(*b*)(2), below), the location of areas where stabilization practices are expected to occur, areas which will be vegetated following construction, surface waters, impaired waters (identifying those with and without a TMDL), high quality waters, inland wetlands, tidal wetlands, fresh-tidal wetlands, and locations where stormwater will be discharged to a surface water (both during and post-construction);

(ii) Site Description

(a) A narrative description of the nature of the construction activity;

(b) An estimate of the total area of the site and the total area of the site that is expected to be disturbed by construction activities;

(c) An estimate of the average runoff coefficient of the site after construction activities are completed;

(d) The name of the immediate receiving water(s) and the ultimate receiving water(s) of the discharges authorized by this general permit; and

(e) Extent of wetland acreage on the site.

(iii) Construction Sequencing

The Plan shall clearly identify the expected sequence of all construction activities on the site and corresponding erosion and sediment controls and shall include an estimated timetable for all construction activities, which shall be revised as necessary to keep the Plan current. Wherever practicable, site construction activities shall be phased to avoid the disturbance of over five acres at one time (or a lesser area of disturbance as required in Section 5(*b*)(3) of the general permit regarding "Impaired Waters". In addition, permanent stormwater control measures, including, but not limited to, stormwater basins should be constructed, where practicable, in the early phases of the construction sequence. The Plan shall clearly show the limits of total disturbance for the construction activity and for each phase.

(iv) Control Measures

The Plan shall include a description, in a separate narrative and on the site plan drawings, of control measures that will be implemented at the site to minimize the discharge of pollutants. Control measures shall be implemented in accordance with Section 5(*b*)(2) of the general permit. In addition, the following information shall be provided:

(a) Calculations supporting the design of sediment and floatables removal controls pursuant to Section 5(*b*)(2)(C)(ii)(b) of the general permit.

(b) Calculations supporting the design of velocity dissipation controls pursuant to Section 5(*b*)(2)(C)(ii)(c) of the general permit.

(v) Runoff Reduction and Low Impact Development (LID) Information

Where runoff reduction practices and/or LID measures are utilized, the following information shall be included in the site plan and narrative (refer to Appendix B for guidance):

(a) The location of the site's streams, floodplains, all wetlands, riparian buffers, slopes 3:1 and steeper, and vegetation identified for preservation and non-disturbance during construction such as forested areas, hay fields, and old fields;

(b) Natural drainage patterns, swales, and other drainage ways, that are not streams, floodplains, or wetlands;

(c) The location of all areas with soils suitable for infiltration[1] and areas of the site best suited for infiltration for the siting of runoff reduction practices and LID design measures;

(d) The location of all areas unsuitable or least suitable for infiltration for the siting of areas of development/building;

1 Infiltration rates must be measured by a field permeability test. The measured field design infiltration rate is equal to one-half the field-measured infiltration rate.

(e) The location of all post-construction stormwater management measures, runoff reduction practices and LID design measures developed pursuant to subsection 5(*b*)(2)(C)(i) of the general permit;

(f) Identification of areas inappropriate for the infiltration of stormwater runoff from land uses with a significant potential for groundwater pollution;

(g) A narrative describing the nature, purpose, implementation and long-term maintenance of post-construction stormwater management measures, runoff reduction practices and LID design measures;

(h) Calculations, for measures developed pursuant to Section 5(*b*)(2)(C)(i) of the general permit, illustrating the retention of the water quality volume or half the water quality volume for the site, as applicable, including a discussion of the impact of any runoff reduction and/or LID practices on these calculations;

(i) A narrative describing any site constraints that prevent retention of the appropriate volume specified in Section 5(*b*)(2)(C)(i) of the general permit including: an explanation of the site limitations; a description of the runoff reduction practices implemented; an explanation of why the amount retained constitutes the maximum extent achievable; an alternative retention volume; and a description of the measures used to provide additional stormwater treatment for sediment, floatables and nutrients above the alternate volume up to the water quality volume; and

(j) Calculations showing the proposed effective impervious cover for the site and, where required or proposed for linear projects pursuant to Section 5(*b*)(2)(C)(i) of the general permit, each outfall drainage area.

(vi) Inspections

(a) Plan Implementation Inspections

The Plan shall include a Plan Implementation inspection checklist, a schedule for conducting inspections, and identification of the designing qualified professional (and District personnel, as appropriate) conducting such inspections and their responsibilities and procedures pursuant to subsection 5(*b*)(4)(A) of the general permit. The Plan shall also include documentation of the qualifications of the inspector and the findings, actions and results of all inspections conducted at the site. For inspection requirements for solar arrays (as defined in Section 2), see Appendix I.

(b) Routine Inspections

The Plan shall include a routine inspection checklist, schedule for conducting inspections, and identification of the qualified inspector(s) conducting the routine inspections and their responsibilities and procedures pursuant to subsection 5(*b*)(4)(B) of the general permit. The Plan shall also include documentation of the qualifications of the inspector(s) and the findings, actions and results of all inspections conducted at the site.

(c) For additional Plan Implementation and Routine Inspection requirements for solar arrays, see Appendix I.

(d) Inspection Checklists

The checklists required by (vi)(a) and (vi)(b) of this subparagraph shall include the information described in the checklist forms found at: www.ct.gov/deep/stormwater. Such inspection checklists shall comply with the requirements and conditions of Section 5(*b*)(4) of the general permit, and include a space for the qualified professional's signature and professional stamp.

(vii) Contractors

(a) The Plan shall clearly identify each contractor and subcontractor that will perform construction activities on the site that have the potential to cause pollution of the waters of the State. The Plan shall also include a copy of the certification statement pursuant to "Other Requirements for Authorization" in Section 3(*b*)(16) of the general permit, signed by each such contractor and subcontractor.

(b) Subdivisions

Where individual lots in a subdivision or other common plan of development are conveyed or otherwise the responsibility of another person or municipality, those individual lot contractors shall be required to comply with the provisions of this general permit and the Stormwater Pollution Control Plan, regardless of lot size or disturbed area. In such cases, the permittee shall provide a copy of the Plan to each individual lot contractor, obtain signed certifications pursuant to Section 3(*b*)(16)(B) of the general permit from such contractors and retain all signed certifications in the Plan.

(viii) Impaired Waters

For construction activities that discharge to impaired waters, as specified in "New Discharges to Impaired Waters" (Section 3(*b*)(13)), the Plan shall include a description of the provisions for controlling the construction and post-construction stormwater discharges to these waters pursuant to subsection 5(*b*)(3) below.

(2) Stormwater Control Measures

Control Measures are required Best Management Practices (BMPs) that the permittee must implement to minimize the discharge of pollutants from the permitted activity. The term "minimize" is defined in Section 2 of this general permit. The Permittee shall comply with the following requirements.

Control Measures shall be designed in accordance with the Guidelines, the Stormwater Quality Manual or the DOT Qualified Products List (https://portal.ct.gov/-/media/DOT/documents/dresearch/ConnDOT-Qualified-Product-List.pdf?la=en). Use of control measures to comply with the "Erosion and Sediment Controls" section (subsection (A) below) of this general permit that are not included in such references must be approved by the commissioner. The narrative and drawings of controls shall address the following minimum components:

(A) Erosion and Sediment Controls

(i) Soil Stabilization and Protection

The Plan shall include a narrative and drawings of interim and permanent soil stabilization practices for managing disturbed areas and soil stockpiles, including a schedule for implementing the practices. The Permittee shall ensure that existing vegetation is preserved to the maximum extent practicable and that disturbed portions of the site are minimized and stabilized throughout the duration of the construction activity at the site.

Regardless of any provisions for erosion control barriers prescribed in the Guidelines, the Permittee shall ensure that two rows of erosion control barriers are installed and maintained on sites with slopes equal to or greater than eight percent (8%) within the contributing drainage area to such barrier. Notwithstanding the foregoing, use of two rows of erosion control barriers shall not be required on the sites specified in this paragraph when: (i) the Commissioner determines, for a limited section or portion of such erosion control barriers, that it is necessary to accommodate animal crossing or animal movement; (ii) the Commissioner approves a Plan that includes an erosion control system whose performance is equivalent to, or exceeds, two rows of erosion control barriers; or (iii) for *linear projects*, the Commissioner has determined that two rows of erosion control barriers, when compared to one row, will cause greater adverse impact to wetlands, waters, or other sensitive resources. In such situation the Commissioner may approve a Plan with one row of erosion control barriers or an alternative erosion control system. When implementing this paragraph the Commissioner may consider the contributing disturbed area, drainage area, length of the slope, flow conditions to maintain sheet flow, the efficacy of the proposed barrier, any adverse impacts from the use of one or two rows of erosion control barriers, and any other factor the Commissioner deems necessary.

Where construction activities have permanently ceased or when final grades are reached in any portion of the site, stabilization and protection practices as specified in Chapter 5 of the Guidelines or as approved by the commissioner shall be implemented within seven days. Notwithstanding any provisions of the Guidelines, areas that will remain disturbed but inactive for at least fourteen calendar days shall receive temporary seeding or soil protection within seven days in accordance with the Guidelines unless site conditions warrant shorter time periods for these provisions.

Areas that will remain disturbed beyond the seeding season as identified in the Guidelines, shall receive long-term, non-vegetative stabilization and protection sufficient to protect the site through the winter. In all cases, stabilization and protection measures shall be implemented as soon as possible in accordance with the Guidelines or as approved by the commissioner.

Temporary or permanent vegetation or other ground cover shall be maintained at all times in all areas of the site, except those undergoing active disturbance, in order to prevent erosion and soil compaction during construction activities. All new temporary and permanent vegetation shall consist of native plant species. With respect to such vegetation, the Permittee shall not use chemical fertilization, herbicides, or pesticides except as necessary to establish such vegetation.

A reverse slope bench is required for any slope steeper than 3:1 (horizontal: vertical) that exceeds 15 feet vertically, except when engineered slope stabilization structures or measures are included or a detailed soil mechanics analysis has been conducted to

verify stability. Engineered analyses and measures must be designed by a CT licensed Professional Engineer with experience in geotechnical engineering or soil mechanics.

(ii) Wetland Protection

Where site disturbance occurs within fifty (50) feet upgradient of a wetland, wetlands, or waters as defined in Section 2 of the general permit, a double row of sediment barrier (e.g. hay bales, silt fence, wattles, etc.) shall be installed in accordance with the Guidelines between the disturbed area and any such downgradient wetland, wetlands or waters.

(iii) Structural Measures

The Plan shall include a narrative and drawings of structural measures to divert flows away from exposed soils, store flows or otherwise limit runoff and minimize the discharge of pollutants from the site. Unless otherwise specifically approved in writing by the commissioner, or if otherwise authorized by another state or federal permit, structural measures shall be installed on upland soils.

For points of discharge from disturbed sites with a total contributing drainage area of between two to five acres, a temporary sediment trap or temporary sediment basin shall be designed and installed in accordance with the Guidelines. For points of discharge from disturbed sites with a total contributing drainage area greater than five acres, a temporary sediment basin shall be designed and installed in accordance with the Guidelines. Such trap(s) or basin(s) must be maintained until final stabilization of the contributing area as defined in "Notice of Termination" (Section 6(*a*)).

The requirement for sediment traps or basins shall not apply to flows from off-site areas and flows from areas of the site that are either undisturbed or have undergone final stabilization, provided such flows are diverted around the temporary sediment trap or basin and are approved in writing by the commissioner.

(iv) Maintenance

The Plan shall include a narrative of the procedures to maintain, in good and effective operating condition, all erosion and sediment control measures, including vegetation, and all other protective measures identified in the Plan. Maintenance of all erosion and sediment controls shall be performed in accordance with the Guidelines, or more frequently as necessary.

(B) Dewatering Wastewaters

Dewatering wastewaters shall be managed in accordance with the Guidelines. Dewatering wastewaters discharged to surface waters shall be discharged in a manner that minimizes the discoloration of the receiving waters. The Plan shall include a narrative and drawings of the operational and structural measures that will be used to ensure that all dewatering wastewaters will not cause scouring or erosion or contain suspended solids in amounts that could reasonably be expected to cause pollution of surface waters of the State. Unless otherwise specifically approved in writing by the commissioner, or if otherwise authorized by another state or federal permit, dewatering measures shall be installed on upland soils.

No discharge of dewatering wastewater(s) shall contain or cause a visible oil sheen, floating solids, or foaming in the receiving water.

(C) Post-Construction Stormwater Management

The Plan shall include a narrative and drawings of measures that will be installed during the construction process to minimize the discharge of pollutants in stormwater discharges that will occur after construction operations have been completed. Post-construction stormwater management measures shall be designed and implemented in accordance with the Stormwater Quality Manual, the DOT Qualified Products List or as approved by the commissioner. Unless otherwise specifically provided by the commissioner in writing, or authorized by another state or federal permit, structural measures shall be placed on upland soils. The Plan shall include provisions to address the long-term maintenance of any post-construction stormwater management measure installed.

(i) Post-Construction Performance Standards

The permittee shall utilize runoff reduction practices (as defined in Section 2 of the general permit) to meet runoff volume requirements based on the conditions below.

(a) Redevelopment

For sites that are currently developed with an effective impervious cover of forty percent or more and for which the permittee is proposing redevelopment, the permittee shall design the site in such a manner as to retain on-site half the water quality volume (as defined in Section 2 of the general permit) for the site and provide additional stormwater treatment without retention for discharges up to the full water quality volume for sediment, floatables and nutrients to the maximum extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice. In cases where the permittee is not able to retain half the water quality volume (e.g., brownfields, capped landfills, bedrock, elevated groundwater, etc.), the permittee shall design the redevelopment to retain runoff volume to the maximum extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice. In such cases, additional stormwater treatment up to the full water quality volume is still required. Any such treatment shall be designed, installed and maintained in accordance with the Stormwater Quality Manual. If retention of half the water quality volume is not achieved, the permittee shall submit a report for the commissioner's review and written approval describing: the measures taken to maximize runoff reduction practices on the site; the reasons why those practices constitute the maximum extent achievable; the alternative retention volume; and a description of the measures used to provide additional stormwater treatment above the alternate volume up to the water quality volume.

(b) Linear Redevelopment

In the case of linear redevelopment projects (e.g. roadway reconstruction or widening or public utility rights of way) for the developed portion of the right of way: (1) for projects that may be unable to comply with the retention of the appropriate portion of the water quality volume specified in subparagraphs (a) and (c) of this subsection, the alternate retention and treatment provisions may also be applied as specified in such subparagraphs, or (2) for projects that will not increase the effective impervious cover within a given watershed, the permittee shall implement the additional stormwater treatment measures referenced in subsections (a) and (c) of this subsection, but will not be required to retain the appropriate portion of the water quality volume specified in such paragraphs.

(c) Other Development

The following performance standard applies to all sites that are currently undeveloped or are currently developed with less than forty percent effective impervious cover. For these sites, the permittee shall design the site to retain the water quality volume for the site. If there are site constraints that would prevent retention of this volume on-site (e.g., brownfields, capped landfills, bedrock, elevated groundwater, etc.), documentation must be submitted, for the commissioner's review and written approval, which: explains the site limitations; provides a description of the runoff reduction practices implemented; provides an explanation of why this constitutes the maximum extent achievable; offers an alternative retention volume; and provides a description of the measures used to provide additional stormwater treatment for sediment, floatables and nutrients above the alternate volume up to the water quality volume. In the case of linear projects that do not involve impervious surfaces (e.g. electrical transmission rights-of-way or natural gas pipelines), retention of the water quality volume is not required as long as the post-development runoff characteristics do not differ significantly from pre-development conditions.

(ii) Post-Construction Control Measures

(a) Runoff Reduction and Low Impact Development ("LID") Practices

The site design shall incorporate runoff reduction practices, low impact development ("LID") practices or other post-construction control measures to meet the performance standards in subsection (i) above, promote groundwater recharge and minimize post-construction impacts to water quality. Please refer to Appendix B for additional guidance information.

(b) Suspended Solids and Floatables Removal

The permittee shall install post-construction stormwater control measures designed to minimize the discharge of suspended solids and floatables (e.g. oil and grease, other floatable liquids, floatable solids, trash, etc.) from stormwater. A goal of 80 percent removal of the annual sediment load from the stormwater discharge shall be used in designing and installing such stormwater control measures. The Plan shall provide calculations supporting the capability of such measures in achieving this goal and any third-party verification, as applicable, of the sediment removal efficiencies of such measures. This goal is not intended to limit local approval authorities from requiring a higher standard pursuant to local requirements.

(c) Velocity Dissipation

Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow to receiving waters so that the natural physical and biological characteristics and functions of such waters are maintained and protected.

(D) Other Controls

The following additional controls shall be implemented:

(i) Waste Disposal

Best management practices shall be implemented to minimize the discharge of litter, debris, building materials, hardened concrete waste, or similar materials to waters of the State. A narrative of these practices shall be provided in the Plan. In addition, the dumping of liquid wastes in storm sewers is prohibited.

(ii) Washout Areas

Washout of applicators, containers, vehicles and equipment for concrete, paint and other materials shall be conducted in a designated washout area. There shall be no surface discharge of washout wastewaters from this area. Such washout shall be conducted: (1) outside of any buffers and at least 50 feet from any stream, wetland or other sensitive resource; or (2) in an entirely self-contained washout system. The permittee shall clearly flag off and designate areas to be used for washing and conduct such activities only in these areas. The permittee shall direct all washwater into a container or pit designed such that no overflows can occur during rainfall or after snowmelt. At least once per week, the permittee shall inspect all of the containers or pits used for washout to ensure structural integrity, adequate holding capacity, and to check for leaks or overflows. If there are signs of leaks, holes or overflows in the containers or pits that could lead to a discharge, the permittee shall repair them prior to further use.

For concrete washout areas, the permittee shall remove hardened concrete waste whenever the hardened concrete has accumulated to a height of ½ of the container or pit or as necessary to avoid overflows. The permittee shall remove and dispose of such hardened concrete waste in accordance with the practices developed for "Waste Disposal" (see Section 5(*b*)(2)(D)(i) of this general permit).

A narrative of maintenance procedures and a record of maintenance and inspections shall be included in the Plan.

(iii) Off-site Vehicle Tracking/Dust Suppression

Off-site vehicle tracking of sediments and the generation of dust shall be minimized. Wet dust suppression shall be used, in accordance with section 22a-174-18(c) of the Regulations of Connecticut State Agencies, for any construction activity that causes airborne particulates. The volume of water sprayed for controlling dust shall be minimized so as to prevent the runoff of water. No discharge of dust control water shall contain a visible oil sheen, floating solids, visible discoloration, or foaming agents or cause a visible sheen, floating solids, visible discoloration, or foaming in any receiving waters.

(iv) Cleaning

All post-construction stormwater structures shall be cleaned of construction sediment and any remaining silt fence shall be removed upon stabilization of the site.

(v) Storage of Chemical and Petroleum Products

All chemical and petroleum product containers stored on the site (excluding those contained within vehicles and equipment) shall be stored within an impermeable containment system that is free of gaps and cracks, can contain any leaks or spills and accumulated precipitation until the collected materials are detected and removed, and

which can hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment system. In addition, all chemicals and petroleum products shall be stored under a roofed area except for those chemicals stored in containers of 100 gallon capacity or more, in which case a roof is not required. Double-walled tanks satisfy the requirements of this paragraph for containment and roofing.

(vi) Cold Water Stream Habitat

For construction activities within a Cold Water Stream Habitat watershed, as specified in Section 3(*b*)(15) of this general permit, the one hundred (100) foot undisturbed buffer specified is that section must be verified post-construction and, where such buffer is located within the boundaries of the construction site, supplemented with additional plantings as necessary to maintain canopy/stream cover.

(3) Additional Control Measures for Impaired Waters

Construction activities discharging directly to impaired waters that do not comply with this subsection are not authorized by this general permit. For construction activities that discharge directly to impaired waters, as specified in "New Discharges to Impaired Waters" (Section 3(*b*)(13) of this general permit), the Plan shall include the following provisions:

(A) In lieu of the provisions regarding "Construction Sequencing" in Section 5(*b*)(1)(B)(iii) of this general permit, no more than 3 acres may be disturbed at any one time. For those areas for which construction activity will be temporarily suspended for a period of greater than 14 days, temporary stabilization measures shall be implemented within 3 days of such suspension of activity. For all areas, permanent stabilization shall be implemented within 30 days of disturbance; ***or***

(B) The Plan shall document that measures are in place to ensure that there will be no discharge to the impaired water from rain events up to a 2-year, 24-hour rain event while construction activity is occurring; ***or***

(C) For discharges to impaired waters with an established TMDL, the requirements for stormwater discharges specified in the TMDL shall be met, or:

(i) the Plan shall document that there is sufficient remaining Waste Load Allocation (WLA) in the TMDL to allow the discharge;

(ii) measures shall be implemented to ensure the WLA will not be exceeded; ***and***

(iii) stormwater discharges shall be monitored, if applicable, for any indicator pollutant identified in the TMDL for every rain event that produces a discharge to ensure compliance with the WLA.

(4) Inspections

All construction activities authorized by this general permit shall be inspected initially for Plan implementation and then weekly for routine inspections. Upon project completion and prior to submission of a Notice of Termination, post-construction and final stabilization inspections shall also be conducted. For inspections at solar arrays, see additional requirements in Appendix I.

(A) Plan Implementation Inspections

Prior to commencement of each phase of the construction activity on the site, the permittee shall contact the designing qualified professional and, for locally exempt projects including, but not limited to, solar arrays subject to Appendix I, the appropriate District to ensure that all required inspections are conducted. For each phase of construction, the site shall be inspected at least once within the first thirty (30) days of construction activity and at least three times, with seven (7) or more days between inspections, within the first ninety (90) days of construction activity to confirm compliance with the general permit and proper initial implementation of all control measures designated in the Plan for each phase of construction. The following conditions shall apply:

(i) for all projects not conducted by a state agency and which disturb more than one (1) acre, the inspector shall be someone who:

(a) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant, and

(b) has no ownership interest of any kind in the project for which the registration is being submitted.

(ii) for projects conducted by a state agency and which disturb more than one (1) acre, the inspector shall be someone who:

(a) meets the requirements in subparagraph (i), above, or

(b) is included in the list of qualified professionals specified in Section 3(*b*)(12)(B) of the general permit.

(B) Routine Inspections

The permittee shall routinely inspect the site for compliance with the general permit, including, but not limited to, compliance with the Plan for the site, until a Notice of Termination under Section 6 of the general permit has been submitted to the Commissioner. Inspection procedures for these routine inspections shall comply with the following:

(i) The permittee shall maintain a rain gauge on-site to document rainfall amounts. At least once a week and within 24 hours of the end of a storm that generates a discharge, a qualified inspector (provided by the permittee), shall inspect, at a minimum, the following: disturbed areas of the construction activity that have not been finally stabilized; all erosion and sediment control measures; all structural control measures; all soil stockpile areas; all washout areas and locations where vehicles enter or exit the site. For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, a routine inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours.

In areas of the site where temporary stabilization has been implemented, a routine inspection shall be conducted at least weekly until final stabilization has been achieved. Once all post-construction stormwater measures have been installed in accordance with the Post-Construction Stormwater Management section (subsection 5(*b*)(2)(C) of this general permit) and cleaned of any construction sediment or debris, a post-construction inspection shall be conducted in accordance with subsection (C), below. For sites that

have implemented final stabilization, a routine inspection shall be conducted in accordance with subsection (D), below.

(ii) During each routine inspection the qualified inspector(s) shall, among other things, evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls implemented to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharge(s). In addition, during each routine inspections the site including, but not limited to, all of the areas noted in the preceding paragraph, shall be inspected for evidence of, or the potential for, pollutants discharging to waters, or entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking.

(iii) The qualified inspector conducting routine inspections shall prepare a report of each inspection. Each such report shall be retained as part of the Plan. A copy of each inspection report shall be submitted electronically in accordance with Section 5(*c*)(2) of the general permit. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel conducting the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharge(s) from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the permittee or his/her authorized representative in accordance with the "Certification of Documents," see Section 5(*h*) of this general permit.

The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three (3) calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven (7) calendar days and incorporated into a revised Plan within ten (10) calendar days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

(iv) Inspectors from the DEEP and the appropriate District, where applicable, may inspect the site to verify compliance with this general permit at any time construction activities are ongoing, and upon completion of construction activities, until a Notice of Termination has been accepted by the Commissioner pursuant to Section 6 of the general permit.

(C) Post-Construction Inspection

(i) For locally approvable projects, once all post-construction stormwater measures have been installed in accordance with Section 5(*b*)(2)(C) of the general permit, Post-Construction Stormwater Management, and cleaned of any construction sediment or debris, the Permittee shall ensure that the appropriate Conservation District or a qualified soil erosion and sediment control professional or a qualified professional

engineer, as appropriate, inspects the site to confirm compliance with the post-construction stormwater management requirements. The permittee shall ensure that the person inspecting the site pursuant to this paragraph is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the Permittee and that such person has no ownership interest of any kind in the project for which the site's registration was submitted. A report shall be prepared and certified in accordance with Sections 6(*a*) and (*b*) of the general permit to indicate compliance with this requirement on the Notice of Termination form.

(ii) For locally exempt projects except those conducted by state agencies, once all post-construction stormwater measures have been installed in accordance with the Section 5(*b*)(2)(C) of the general permit, "Post-Construction Stormwater Management", and cleaned of any construction sediment or debris, the permittee shall ensure that a qualified soil erosion and sediment control professional or a qualified professional engineer inspects the site to confirm compliance with the post-construction stormwater management requirements of the general permit. A report shall be prepared and certified in accordance with Sections 6(*a*) and (*b*) of the general permit to indicate compliance with this requirement on the Notice of Termination form.

(iii) For projects conducted by state agencies, once all post-construction stormwater measures have been installed in accordance with the Post-Construction Stormwater Management section (subsection 5(*b*)(2)(C)) and cleaned of any construction sediment or debris, the DOT District Engineer or his/her designee and/or DOT District Environmental Coordinator, or the designated employee of another state agency, will inspect the site to confirm compliance with the post-construction stormwater management requirements of the general permit.

(D) Final Stabilization Inspection

For all projects, once the site has achieved final stabilization for at least one full growing season (April – October) in the year following the end of construction, the Permittee shall have the site inspected by a qualified inspector to confirm such stabilization is maintained. The Permittee shall indicate compliance with this requirement on the Notice of Termination form.

(5) Keeping Plans Current

The Permittee is responsible for keeping their Plan in compliance with this general permit at all times. This may involve any or all of the following:

(A) The permittee shall amend the Plan if the actions required by the Plan fail to prevent pollution or unauthorized discharges to the waters of the state, or fail to comply with any other provision of this general permit. The Plan shall also be amended whenever there is an addition of or change in contractors or subcontractors at the site, the designing qualified professional, District personnel, or a change in design, construction, operation, or maintenance at the site which has not otherwise been addressed in the Plan.

The permittee shall submit a new registration to the commissioner in accordance with Section 4 of this general permit if the amount of disturbed area increases from the amount specified in the registration approved by the Commissioner or there are changes to engineered or non-engineered construction or post-construction control measures that have the potential to increase the quantity or quantity of pollution in the site's stormwater discharges. Such new registration shall be submitted before any such increases or changes are implemented.

(B) The commissioner may notify the permittee at any time that the Plan or the site does not meet one or more requirements of this general permit. Within seven (7) days of such notice, or such other time as the commissioner may allow, the permittee shall make the required changes to the Plan and perform all actions required by such revised Plan. Within 15 days of such notice, or such other time as the commissioner may allow, the permittee shall submit to the commissioner a written certification that the requested changes have been made and implemented and such other information as the commissioner requires. Any such certification or information shall be submitted in accordance with the 'Duty to Provide Information" and "Certification of Documents," Sections 5(*g*) and 5(*h*) of this general permit.

(C) For any stormwater discharges authorized under any previous version of this general permit, the Permittee shall, excluding any provisions for which an exemption is provided for in Section 4(*c*)(3)(C) of the general permit, update their Plan prior to their re-registration pursuant to Section 4(*c*)(3) of the general permit, and in no case later than one hundred twenty (120) days after the effective date of this general permit to ensure and maintain compliance with any applicable term and condition of this general permit. For previously authorized sites discharging to impaired waters or other sensitive areas, the commissioner may require additional control measures or provide authorization under an individual permit pursuant to Sections 4(*i*) and 3(*i*).

(D) The Permittee shall ensure that any person keeping this Plan or part thereof current, under the Keeping Plans Current section of this permit, has qualifications that would be required under this general permit to initially prepare the Plan or part thereof.

(E) The permittee shall retain as part of the Plan all modifications, and any documentation associated with each modification, made under this section.

(6) Failure to Prepare, Maintain or Update Plan

In no event shall failure to complete, maintain or update a Plan, in accordance with the "Development of Contents of the Plan" and "Keeping Plans Current" sections (subsections 5(*b*)(1) and 5(*b*)(5)) of this general permit, excuse non-compliance or relieve a permittee of responsibility to implement any actions required to protect the waters of the state or comply with the requirements of this permit.

(7) Plan Signature

The Plan shall be signed and certified as follows:

(A) The Plan shall be signed by the permittee in accordance with the Section 5(*h*) of this general permit, "Certification of Documents".

(B) The Plan shall include certification by all contractors and subcontractors in accordance with Section 5(*b*)(1)(B)(vii)) of this general permit, "Contractors".

(C) The Plan shall include a copy of the certification by a professional engineer or landscape architect made in accordance with Section 3(*b*)(9) of this general permit.

(8) Plan Review Certification

For a locally approvable project pursuant to Section 4(*c*) of this general permit, a copy of the Plan review certification made in accordance with Section 3(*b*)(10) or (11) of this general permit, as

applicable, shall be maintained with the Plan. (Note: Construction activities reviewed and certified pursuant to those sections are still subject to the local erosion and sediment control and stormwater management regulations of the municipality in which the activity is conducted.)

(9) Plan Submittal

The Permittee shall ensure that the Plan is submitted to the commissioner and other parties as follows:

(A) For all Locally Exempt Projects with greater than one acre of soil disturbance, the Permittee shall submit an electronic copy of the Plan and a completed Registration Form to the commissioner.

(B) For Locally Approvable projects, the permittee shall provide an electronic copy of the Plan and a completed Registration Form to the commissioner. In addition, a completed Registration Form for this general permit shall be submitted to the following persons immediately upon request:

(i) The municipal planning commission, zoning commission and/or inland wetlands agency, or its respective enforcement officer or designated agent; and

(ii) In the case of a stormwater discharge through a municipal separate storm sewer system, the municipal operator of the system; and

(iii) In the case of a stormwater discharge located within a public drinking water supply watershed or aquifer area, the water company responsible for that water supply.

DO NOT SUBMIT any information that does not pertain to stormwater management or erosion and sediment control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.). Any plans stamped "not for construction" will not be accepted.

(c) Reporting and Record Keeping Requirements

(1) Record Keeping

(A) For a period of at least five years from the date the Notice of Termination is accepted by the Commissioner, the permittee shall retain copies of the Plan and all reports required by this general permit, and records of all data used to complete the registration for this general permit, unless the commissioner specifies another time period in writing.

(B) The permittee shall retain an updated copy of the Plan required by this general permit at the construction site from the date construction is initiated at the site until the date construction at the site is completed.

(C) Inspection records must be retained as part of the Plan for a period of five (5) years after the date of inspection. In addition, the following inspection reports shall be kept on-site with the Plan and shall be submitted to the Commissioner upon request:

(i) Plan Implementation Inspections conducted in accordance with Section 5(*b*)(4)(A) and recorded on checklist forms prepared pursuant to Section 5(*b*)(1)(B)(vi)(a).

(ii) Routine Inspections conducted in accordance with Section 5(*b*)(4)(B) and recorded on checklist forms prepared pursuant to Section 5(*b*)(1)(B)(vi)(b).

(D) Plan Modification

Plan modifications made pursuant to Section 5(*b*)(5) of this general permit and any documentation associated with such modification shall be kept on-site with the Plan.

(2) Reporting

(A) The reports specified in this section shall be provided to the Commissioner within the timeframe specified in any request by the Commissioner, and if no timeframe is specified, no later than thirty (30) days after the date of any such request. If requested by the Commissioner, the reports shall be submitted to the Commissioner using NetDMR in the manner specified in subsection (B), below.

(B) NetDMR Reporting

The permittee shall submit all reporting of inspections, Plan updates or other reporting electronically using NetDMR, a web-based tool that allows Permittees to electronically submit stormwater reports through a secure internet connection. Unless otherwise approved in writing by the commissioner, no later than thirty (30) days after authorization under this permit the Permittee shall begin reporting electronically using NetDMR. Specific requirements regarding subscription to NetDMR and submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

(i) Submittal of NetDMR Subscriber Agreement

At or before the time the Permittee submits a registration for this permit, the Permittee and/or the person authorized to sign the Permittee's reports ("Signatory Authority") as described in RCSA Section 22a-430-3(b)(2) shall contact the Department at deep.netdmr@ct.gov and initiate the NetDMR subscription process for electronic submission of Stormwater Report information. Information on NetDMR is available on the Department's website at www.ct.gov/deep/netdmr. On or before the date of authorization under this permit the Permittee shall submit a signed and notarized copy of the *Connecticut DEEP NetDMR Subscriber Agreement* to the Department.

(ii) Submittal of Reports and other documents Using NetDMR

Unless otherwise approved by the commissioner, on or before thirty (30) days following authorization under this permit, the Permittee and/or the Signatory Authority shall electronically submit reports and any other documents required under this permit or by request of the Commissioner to the Department using NetDMR in satisfaction of the requirements of Section 5(*c*)(2)(A) of this permit.

Reports shall be submitted electronically to the Department no later than fifteen (15) days following the completed reporting period. NetDMR is accessed from: http://www.epa.gov/netdmr.

(iii) Submittal of NetDMR Opt-Out Requests

If the Permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for electronically submitting reports, the commissioner may approve an alternative for the submission of reports. Any such request shall be submitted in writing to the Department for written approval on or before the Permittee's date of permit authorization. This demonstration

shall be valid for twelve (12) months from the date of the Department's approval and shall thereupon expire. At such time, reports shall be submitted electronically to the Department using NetDMR unless the Permittee submits a renewed request for an alternative and such request is approved by the Department.

All requests under this provision and requests for the NetDMR subscriber form should be sent to the following address or by email at deep.netdmr@ct.gov:

Attn: NetDMR Coordinator
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

(d) Regulations of Connecticut State Agencies Incorporated into this General Permit

The permittee shall comply with sections 22a-430-3 and 22a-430-4 of the Regulations of Connecticut State Agencies which are hereby incorporated into this general permit, as if fully set forth herein.

(e) Reliance on Registration

In evaluating a registration submitted under this general permit, the commissioner has relied on information provided by the registrant. If such information proves to be false or incomplete, any authorization reliant on such information may be suspended or revoked in accordance with law, and the commissioner may take any other action authorized by law.

(f) Duty to Correct and Report Violations

Upon learning of any violation of this general permit, including, but not limited to, any failure to follow the Plan or any adverse impacts on wetlands or waters a permittee shall immediately cease all construction activities and take all reasonable action to determine the cause of such violation, return to compliance, correct and mitigate the results of such violation, and prevent such violation from recurring. Construction activities shall not recommence until such reasonable action(s) have been taken and such violation and/or adverse impacts have been corrected and compliance has been restored. The permittee shall ensure that any violations of the terms and conditions of the general permit, including but not limited to, the Plan, identified during an inspection or at any other time, that result in the potential to discharge pollutants to waters of the state are reported to the commissioner within two (2) hours of discovery, or, for those violations discovered outside normal business hours, at the start of the next business day. Violations shall be reported to the DEEP stormwater staff at deep.stormwaterstaff@ct.gov and by calling (860) 424-3025. Furthermore, within five (5) days of discovery of a violation, the Permittee shall prepare and submit to the commissioner a written report signed by the Permittee, which documents the cause of the violation, duration including dates and times, and corrective action taken to address the violation and any action taken or planned to prevent future occurrences. Such information shall be filed in accordance with Section 5(*h*) of this general permit, "Certification of Documents".

In addition, nothing in this section shall affect any other action the commissioner is authorized to take regarding a violation of this general permit.

(g) Duty to Provide Information

The commissioner may request any information pertinent to the construction activity or concerning the Permittee's compliance with this general permit. If requested, the permittee shall provide any such information within fifteen (15) days of such request or other time period as may be specified in writing by the commissioner.

(h) Certification of Documents

Unless otherwise specified in this general permit, any document, including but not limited to any notice, information or report, which is submitted to the commissioner under this general permit shall be signed by the permittee, or a duly authorized representative of the permittee, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with section 22a-6 of the Connecticut General Statutes, pursuant to section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

(i) Date of Filing

For purposes of this general permit, the date of filing with the commissioner of any document is the date such document is received by the commissioner. The word "day" as used in this general permit means the calendar day; if any date specified in the general permit falls on a Saturday, Sunday, or legal holiday, such deadline shall be the next business day thereafter.

(j) False Statements

Any false statement in any information submitted pursuant to this general permit may be punishable as a criminal offense, in accordance with section 22a-6 of the Connecticut General Statutes, pursuant to section 53a-157b of the Connecticut General Statutes.

(k) Correction of Inaccuracies

Within fifteen (15) days after the date a permittee becomes aware of a change in any information submitted pursuant to this general permit, or becomes aware that any such information is inaccurate or misleading or that any relevant information has been omitted, such permittee shall correct the inaccurate or misleading information or supply the omitted information in writing to the commissioner. Such information shall be filed in accordance with the certification requirements prescribed in Section 5(*h*) of this general permit.

(l) Transfer of Authorization

Any authorization issued by the commissioner under this general permit is transferable only in accordance with the provisions of section 22a-6o of the General Statutes. Any person or municipality proposing to transfer any such authorization shall submit a license transfer form to the commissioner. For state projects, the Permittee must be contractually authorized to conduct the transfer. The transferee is not authorized to conduct any activities under this general permit until the transfer is approved by the commissioner. The transferee may adopt by reference the Plan developed by the transferor. The transferee shall update the Plan as required by Section 5(*b*)(5) of this general permit, "Keeping Plans Current".

(m) Other Applicable Requirements

Nothing in this general permit shall relieve the permittee of the obligation to comply with any other applicable federal, state and local requirements, including but not limited to the obligation to obtain any other required authorizations or licenses.

(n) Other Rights

This general permit is subject to and does not derogate any present or future rights or powers of the State of Connecticut and conveys no rights in real or personal property nor any exclusive privileges, and is subject to all public and private rights and to any federal, state, and local laws pertinent to the property or construction activity affected by such general permit. In conducting any construction activity authorized hereunder, the permittee shall not cause pollution, impairment, or destruction of the air, water, or other natural resources of this state. The issuance of this general permit shall not create any presumption that this general permit should or will be renewed.

Section 6. Termination Requirements

(a) Notice of Termination

At the completion of a construction project the Permittee shall submit a Notice of Termination in accordance with the requirements of this section. A project shall be considered complete after all post-construction measures are installed, cleaned, functioning, and inspected and the site has achieved final stabilization and inspection (see Sections 5(*b*)(4)(C) & (D) of the general permit, respectively) for at least one full growing season (i.e. April through October) in the year following the cessation of construction activities. Final stabilization must be achieved for all phases of construction, and for solar projects, any additional requirements in Appendix I complied with, before a Notice of Termination may be submitted.

(b) Termination Form

A Notice of Termination shall be filed on forms prescribed and provided by the commissioner and shall include the following:

(1) The permit number as provided to the permittee on the permit certificate;

(2) The name of the registrant as reported on the general permit registration form (DEEP-PED-REG-015), or if a license transfer has been approved by the commissioner, the name of the permittee on a license transfer form;

(3) The address of the completed construction site;

(4) The dates when:

(A) Construction was completed;

(B) All storm drainage structures were cleaned of construction debris pursuant to the "Other Controls" section (subsection 5(*b*)(2)(D)) of this general permit;

(C) The post-construction inspection was conducted pursuant to Section 5(*b)(*4)(C);

(D) The final stabilization inspection was conducted pursuant to Section 5(*b*)(4)(D).

(5) A description of the post-construction activities at the site; and

(6) Signatures of:

(A) The permittee; and

(B) The person who conducted the post-construction inspection pursuant to Section 5(*b*)(4)(C) of the general permit.

(C) The person who conducted the final stabilization inspection pursuant to Section 5(*b*)(4)(D) of the general permit.

(c) Where to File a Termination Form

A termination form shall be filed with the commissioner at the following address:

CENTRAL PERMITS PROCESSING UNIT
BUREAU OF MATERIALS MANAGEMENT & COMPLIANCE ASSURANCE
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Section 7. Commissioner's Powers

(a) Abatement of Violations

The commissioner may take any action provided by law to abate a violation of this general permit, including but not limited to penalties of up to $25,000 per violation per day under Chapter 446k of the Connecticut General Statutes, for such violation. The commissioner may, by summary proceedings or otherwise and for any reason provided by law, including violation of this general permit, revoke a permittee's authorization hereunder in accordance with sections 22a-3a-2 through 22a-3a-6, inclusive, of the Regulations of Connecticut State Agencies. Nothing herein shall be construed to affect any remedy available to the commissioner by law.

(b) General Permit Revocation, Suspension, or Modification

The commissioner may, for any reason provided by law, by summary proceedings or otherwise, revoke or suspend this general permit or modify to establish any appropriate conditions, schedules of compliance, or other provisions which may be necessary to protect human health or the environment.

(c) Filing of an Individual Permit Application

If the commissioner notifies a permittee in writing that such permittee must obtain an individual permit, the permittee shall file an application for an individual permit within thirty (30) days of receiving the commissioner's notice or such other time that the commissioner specified in the notice to the permittee. While such application is pending before the commissioner, the permittee shall continue to comply with the terms and conditions of this general permit. Nothing herein shall affect the commissioner's power to revoke a permittee's authorization under this general permit at any time.

Issued: December 21, 2020

Katherine S. Dykes

Katherine S. Dykes
Commissioner

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX A

Endangered and Threatened Species

In order to be eligible for coverage under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("GP" or "the GP"), under section 3(*b*)(2) of the GP, a registrant must ensure that the construction activity, as defined in Section 2 of the GP, does not threaten the continued existence of any state or federal species listed as endangered or threatened ("listed species") or result in the destruction or adverse modification of any habitat associated with such species.

In order to prevent significant, unforeseen delays in the processing of a registration under the GP, registrants should assess compliance with section 3(*b*)(2) early in the planning stages of a project. The Department of Energy and Environmental Protection ("the Department") strongly recommends that this assessment *be initiated up to one year, or more,* prior to the projected construction initiation date, and even before the purchase of the site of the construction activity. At a minimum, registrants must assess compliance with section 3(*b*)(2) prior to submission of the Registration Form for the GP.

This Appendix describes the ways that a registrant can comply with section 3(*b*)(2) of the GP. In connection with the filing of a registration a registrant can perform a self-assessment described in Section 1, seek a limited two-year determination or a safe harbor determination from the Department's Wildlife Division under Sections 2 or 3, respectively, or stipulate in writing to the presence of listed species or any habitat associated with such species and develop a mitigation plan pursuant to Section 5 of this Appendix. While some means of compliance are more limited than others, the options set out in this Appendix are not mutually exclusive and all options remain available to a registrant. For example, a registrant may perform a self-assessment under Section 1 and seek a safe harbor determination under Section 3 of this Appendix. Provided the requirements of this Appendix are met, the choice of how to proceed is the registrant's.

Section 1. Self Assessment through Natural Diversity Database Map Review and Screening

Before submission of a registration for coverage under this GP, a registrant must review the current versions of the Department's Natural Diversity Data Base ("NDDB") maps. Except as provided for in Sections 2, 3 or 5 of this Appendix, such review must occur no more than six months before such submission. Such review provides a method for screening whether the Department is already aware of listed species that may be present on the site of the construction activity. These maps can be viewed online at:

CT DEEP Natural Diversity Data Base Maps
CTECO Webpage (in the interactive Map Viewer)

Screening

The site of the construction activity must be compared to the shaded areas depicted on the NDDB map to determine if the site is entirely or partially within a shaded area. If the site is entirely or partially within a shaded area for a listed species a registrant can only achieve compliance with section 3(*b*)(2) of the GP by obtaining a limited two-year determination under Section 2, a safe harbor determination under Section 3, or an approved mitigation plan under Section 5 of this Appendix from the Department's Wildlife Division.

If the site of the construction activity is not entirely or partially within a shaded area, then the Department is not aware of any listed species at the site of the construction activity. Based upon this screening, and provided the registrant has no reasonably available verifiable, scientific or other credible information that the construction activity could reasonably be expected to violate section 3(*b*)(2) of the GP, when completing the Registration Form for this GP a registrant may check the box that indicates that the construction activity will not impact federal or state listed species.

A registrant using only self-assessment under this section may utilize the results of any such self-assessment for up to, but no more than, six months from the date of such assessment. Note, however, that the NDDB maps are not the result of comprehensive state-wide field investigations, but rather serve as a screening tool. Using such maps as a screening tool does not provide a registrant with an assurance that listed species or their associated habitat may not be encountered at the site of the construction activity. Notwithstanding the NDDB screening results, if a listed species is encountered at the site of the construction activity, the registrant shall promptly contact the Department and may need to take additional action to ensure that the registrant does not violate section 3(*b*)(2) of the GP.

Section 2. Obtaining a Limited Two-Year Determination

A registrant may seek a written determination from the Department's Wildlife Division, good for two years, that the proposed construction activity complies with section 3(*b*)(2) of the GP. To obtain this limited two-year determination, a registrant must, in addition to conducting the NDDB map review in Section 1 of this Appendix, provide the Department's Wildlife Division with (1) any reasonably available verifiable, scientific or other credible information about whether the construction activity could reasonably be expected to result in a violation of section 3(*b*)(2) of the GP, and (2) limited information about the site of the proposed construction activity, but less information than would be necessary for a safe harbor determination under Section 3 of this Appendix. The limited information necessary for a two-year determination is on the current "Request for Natural Diversity Database (NDDB) State Listed Species Review" form on the Department's website. The form and instructions for seeking such a limited two-year determination are available at www.ct.gov/DEEP/nddbrequest.

Provided the registrant's information is accurate and the Department's Wildlife Division determines that the construction activity will not violate section 3(*b*)(2) of the GP, the registrant shall receive a limited two-year determination from the Department. Any such determination may indicate that the construction activity will not impact listed species or their associated habitat, or it may include specific conditions to be implemented to avoid or significantly minimize any impacts that may be encountered at the site of the construction activity. For purposes of submitting a registration for the GP, any such limited two-year determination can be relied upon by the person receiving such determination for two years from the date of such determination. Like, however, the NDDB screening procedure in Section 1 of this Appendix, a limited two-year determination does not provide a registrant with an assurance that listed species or their associated habitat may not be encountered at the site of the construction activity. If a listed species is encountered, the registrant shall promptly contact the Department and may need to take additional action to ensure that the construction activity does not violate section 3(*b*)(2) of the GP.

If a registrant receives a limited two-year determination from the Department, the registrant should check the limited two-year determination box on the GP registration form and include the Department's two-year limited determination letter with the GP Registration form. Checking the limited two-year determination box on the registration form and failing to provide the determination letter from the Department's Wildlife Division with the GP Registration form will delay and may prevent processing of a registration.

If based upon the information provided by a registrant seeking a limited two-year determination the Department's Wildlife Division determines that the construction activity could impact listed species or their associated habitat, or that the Department needs additional information to make a limited two-year determination, the registrant may still achieve compliance with section 3(*b*)(2) of the GP through providing additional information pursuant to Section 4 or developing a mitigation plan pursuant to Section 5 of this Appendix.

A registrant may request one or more one-year extensions to a limited two-year determination under this section. If the Department's Wildlife Division has prescribed a form for requesting an extension, any such request shall be made using the prescribed form. There is a presumption that requests for a one-year extension of a limited two-year determination shall be granted. However, this presumption can be rebutted if the Department determines that a change in any of the following has occurred since an initial limited two-year determination or any extension was granted: the construction activity affecting or potentially affecting listed species or their associated habitat; the NDDB maps for the site of the construction activity; the limited information upon which a limited two-year determination or any extension was granted; or other information indicative of a change in circumstance affecting listed species or their associated habitat. Any one-year extension granted under this paragraph shall run from the date the Department's Wildlife Division issues its determination to grant an extension and shall be treated under the same conditions as a limited two-year determination as provided for in this section. Any letter granting a one-year extension shall be included with a registration along with the original limited two-year determination as provided for in this section.

Section 3. Obtaining a Safe Harbor Determination

A registrant may seek a written determination from the Department's Wildlife Division, good for three years, with the potential to be extended for an additional year, that proposed construction activity complies with section 3(*b*)(2) of the GP. Any such determination shall constitute a "safe harbor" for purposes of section 3(*b*)(2) of the GP.

To obtain a safe harbor determination, a registrant must, in addition to conducting the NDDB review in section 1 of this Appendix, provide the Department's Wildlife Division with any reasonably available verifiable, scientific or other credible information about whether the construction activity could reasonably be expected to result in a violation of section 3(*b*)(2) of the GP and specific information about the site of the construction activity. The specific information necessary for a safe harbor determination is listed in Attachment A to this Appendix. This information must be sufficient to allow the Wildlife Division to adequately assess the site for potential risks to listed species and their associated habitat. While the Department recognizes certain information is necessary to make a safe harbor determination, it also recognizes that a registrant may need to obtain a safe harbor determination early in its project's approval process in order to make prudent business decisions about purchasing a site or proceeding to final project designs. The form and instructions for seeking a safe harbor determination are available at www.ct.gov/DEEP/nddbrequest.

Provided the registrant's information is accurate and the Department's Wildlife Division determines that the construction activity will not violate section 3(*b*)(2) of the GP, the registrant shall receive a safe harbor determination from the Department. A safe harbor determination may indicate that the construction activity will not impact listed species or their associated habitat, or it may include specific conditions to be implemented to avoid or significantly minimize any impacts that may be encountered at the site of the construction activity. The Department shall honor the safe harbor determination for three years from the date it is issued, meaning that unlike the NDDB review in Section 1 or the limited two-year determination in Section 2 of this Appendix, if the Department makes a safe harbor determination and a registrant remains in compliance with any conditions in any such determination, irrespective of what may be found at the site of the construction activity, a registrant shall be considered in compliance with section 3(*b*)(2) of the GP. However, a safe harbor determination shall

not be effective if a construction activity may threaten the continued existence of any federally listed species or its critical habitat under federal law. If a federally listed species or its critical habitat is encountered on the site of the construction activity, the registrant shall promptly contact the Department and may need to take additional action to ensure that the construction activity does not violate federal law or section 3(*b*)(2) of the GP.

If a registrant receives a safe harbor determination from the Department, the registrant should check the safe harbor determination box on the GP registration form and include the Department's safe harbor determination with the GP Registration form. Checking the safe harbor box on the registration form and failing to provide the safe harbor determination letter from the Department's Wildlife Division with the GP Registration form will delay and may prevent processing of a registration.

If based upon the information provided by a registrant seeking a safe harbor determination the Department's Wildlife Division determines that the construction activity could impact listed species or their associated habitat, or that the Department needs additional information to make a safe harbor determination, the registrant may still achieve compliance with section 3(*b*)(2) of the GP through providing additional information pursuant to Section 4 or developing a mitigation plan pursuant to Section 5 of this Appendix.

If a registrant receives a safe harbor determination from the Department's Wildlife Division, anytime during the third year of such safe harbor, a registrant may request a one-year extension of that safe harbor. If the Department's Wildlife Division has prescribed a form for requesting an extension, any such request shall be made using the prescribed form. There is a presumption that a request for a one-year extension of a safe harbor shall be granted. However, this presumption can be rebutted if the Department determines that a change in any of the following has occurred since the safe harbor was granted: the construction activity affecting or potentially affecting listed species or their associated habitat; the NDDB maps for the site of the construction activity; the information upon which the safe harbor was granted; or other information indicative of a change in circumstance affecting listed species or their associated habitat. A registrant may seek only one extension, for one year, to a safe harbor determination. Any one-year extension granted under this paragraph shall run from the date of the Department's Wildlife Division issues its determination to grant an extension and shall be honored by the Department in the same manner as a safe harbor determination noted above. Any letter granting a one-year extension shall be included with a registration along with the original safe harbor determination as provided for in this section.

Section 4. Providing Additional Information

For the Department's Wildlife Division to make a limited two-year determination under Section 2 or a safe harbor determination under section 3 of this Appendix, limited additional information may be required to determine if the construction activity would impact listed species or their associated habitat. If the species in question is a state listed endangered or threatened species under section 26-306 of the general statutes, a registrant shall, in consultation with the Department's Wildlife Division, provide the limited additional information requested by the Department's Wildlife Division. Such information may include, but is not limited to, a survey of specific listed species in question. If the species in question is a federally listed threatened or endangered species, in addition to the Department's Wildlife Division, a registrant shall also consult with the U.S. Fish and Wildlife Service and shall provide any additional information requested by that agency. A registrant that initially sought or obtained a limited two-year determination may, after providing the additional information required under this section request a safe harbor determination under Section 3 of this Appendix.

At any time, as an alternative to proceeding under Section 2, 3 or 4 of this Appendix, a registrant may stipulate, in writing, to the presence of one or more listed species or their associated habitat. A registrant choosing this alternative shall proceed to develop a mitigation plan under Section 5 of this Appendix.

If based upon any additional information provided to the Department's Wildlife Division, and as applicable, the U.S. Fish & Wildlife Service, the Department's Wildlife division determines that construction activity will be in compliance with section 3(*b*)(2) of the GP, a registrant shall receive a limited two-year determination under Section 2 or a safe harbor determination under Section 3 of this Appendix, as applicable.

If the Department's Wildlife Division determines that additional information is necessary to determine if the construction activity has the potential to impact listed species or their associated habitat, and a registrant chooses to not provide such information, a registrant shall proceed with the self-assessment through an NDDB review under Section 1 of this Appendix, or stipulate to the existence of a listed species or associated habitat and develop a mitigation plan under Section 5 or such registrant shall not be eligible to register under the GP.

Section 5. Developing a Mitigation Plan

The Department's Wildlife Division may determine that the construction activity has the potential to adversely impact listed species or their associated habitat. However, it may be possible to modify the construction activity or undertake certain on-site measures to avoid or significantly minimize such impacts. If the species or associated habitat in question is a state listed endangered or threatened species under section 26-306 of the general statutes, a registrant shall consult with the Department's Wildlife Division to determine if an acceptable mitigation plan can be developed so impacts can be avoided or minimized such that a registrant remains in compliance with section 3(*b*)(2). If the species in question is a federally listed threatened or endangered species, any such consultation shall also include the U.S. Fish and Wildlife Service.

If a registrant in consultation with the Department's Wildlife Division, and as applicable, the U.S. Fish & Wildlife Service, develops a mitigation plan that is approved by the Department's Wildlife Division, or as applicable, the U.S. Fish & Wildlife Service, the registrant shall receive a limited two-year determination under Section 2 or a safe harbor determination under Section 3 of this Appendix. In this situation, in addition to checking the two-year determination box or the safe harbor determination box, as applicable, on the registration form, the registrant shall also check the box on the registration form indicating that it has an approved mitigation plan and provide a status update on the registration form as to whether it has completed or is still in the process of implementing the approved mitigation plan.

If an approved mitigation plan has not been fully implemented by the time a registration is submitted, completing all remaining tasks in the plan shall become an enforceable condition of any registration issued to the registrant.

If the Department determines that the construction activity has the potential to adversely impact listed species or their associated habitat and the registrant and the Department, and as applicable, the U.S. Fish & Wildlife Service, are not able to agree on an acceptable mitigation plan that is approved by the Department, and as applicable, the U.S. Fish & Wildlife Service, any such registrant shall not be eligible to register under the GP.

APPENDIX A
ATTACHMENT A

Specific Information Needed to Apply for a Safe Harbor Determination

A Safe Harbor Determination will be made upon the submission of a detailed report that fully addresses the matters noted below. For the Department's Wildlife Division to make a safe harbor determination, the report should synthesize and analyze this information, not simply compile information. Those providing synthesis and analysis need appropriate qualifications and experience. A request for a safe harbor determination shall include:

1) Habitat Information, including GIS mapping overlays, identifying:

- wetlands, including wetland cover types;
- plant community types;
- topography;
- soils;
- bedrock geology;
- floodplains, if any;
- land use history; and
- water quality classifications/criteria.

2) Photographs - The report should also include photographs of the site, including all reasonably available aerial or satellite photographs and an analysis of such photographs.

3) Inspection - The report should include a visual inspection(s) of the site, preferably when the ground is visible. This inspection can also be helpful in confirming or further evaluating the items noted above.

4) Biological Surveys - The report should include all biological surveys of the site where construction activity will take place that are reasonably available to a registrant. A registrant shall notify the Department's Wildlife Division of biological studies of the site where construction activity will take place that a registrant is aware of but are not reasonably available to the registrant.

5) Based on items #1 through 4 above, the report shall include a Natural Resources Inventory of the site of the construction activity. This inventory should also include a review of reasonably available scientific literature and any recommendations for minimizing adverse impacts from the proposed construction activity on listed species or their associated habitat.

6) In addition, to the extent the following is available at the time a safe harbor determination is requested, a request for a safe harbor determination shall include and assess:

- Information on Site Disturbance Estimates/Site Alteration information

- Vehicular Use

- Construction Activity Phasing Schedules, if any; and

- Alternation of Drainage Patterns

APPENDIX B

Connecticut Department of Energy & Environmental Protection
Inland Water Resources Division Fact Sheet
Considering Low Impact Development Principles in Site Design

In order to reduce the impact of development and address stormwater quality issues, the Department requires the use of Low Impact Development (LID) measures in accordance with Sections 5(*b*)(2)(C)(i) and (ii) of the general permit. LID is a site design strategy intended to maintain or replicate predevelopment hydrology through the use of small-scale controls, integrated throughout the site, to manage stormwater runoff as close to its source as possible. Infiltration of stormwater through LID helps to remove sediments, nutrients, heavy metals, and other types of pollutants from runoff.

Key Strategies for LID

Key strategies for effective LID include: infiltrating, filtering, and storing as much stormwater as feasible, managing stormwater close to where the rain/snow falls, managing stormwater at multiple locations throughout the landscape, conserving and restoring natural vegetation and soils, preserving open space and minimizing land disturbance, designing the site to minimize impervious surfaces, and providing for maintenance and education. Water quality and quantity benefits are maximized when multiple techniques are grouped together. In areas of compacted and/or possibly contaminated soils, soil suitability should be further investigated prior to selecting optimum treatment and/or remediation measures. Where soil conditions permit, the DEEP encourages the utilization of one, or a combination of, the following measures:

- the use of pervious pavement or grid pavers (which are very compatible for parking lot and fire lane applications), or impervious pavement without curbs or with notched curbs to direct runoff to properly designed and installed infiltration areas;
- the use of vegetated swales, tree box filters, and/or infiltration islands to infiltrate and treat stormwater runoff (from building roofs, roads, and parking lots);
- the minimization of access road widths and parking lot areas to the maximum extent possible to reduce the area of impervious surface;
- the use of dry wells to manage runoff from building roofs;
- incorporation of proper physical barriers or operational procedures for special activity areas where pollutants could potentially be released (e.g. loading docks, maintenance and service areas, dumpsters, etc.);
- the installation of rainwater harvesting systems to capture stormwater from building roofs for the purpose of reuse for irrigation (i.e. - rain barrels for residential use and cisterns for larger developments);
- the use of residential rain gardens to manage runoff from roofs and driveways;
- the use of vegetated roofs (green roofs) to detain, absorb, and reduce the volume of roof runoff; and
- providing for pollution prevention measures to reduce the introduction of pollutants to the environment.

The 2004 Stormwater Quality Manual LID Appendix and the 2002 Erosion and Sediment Control Guidelines LID Appendix both provide guidance on implementing LID measures. A guide to LID resources can also be found in the DEEP Low Impact Development Resources Factsheet (PDF).

LID in Urban Areas

If the proposed site is located in a highly urbanized area, it is likely underlain by urban land complex soils. The Natural Resources Conservation Service (NRCS) Soil Web Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm) provides information on soil textures, parent materials, slopes, height of seasonal high water table, depth to restrictive layer, and permeability. In highly developed areas, infiltration may be limited due to the high percentage of impervious cover. However, infiltration practices may be suitable at urban sites depending on:

- Potential contamination of soils in historically industrialized areas. The siting of areas for infiltration must consider any existing soil or groundwater contamination.

- Site specific soil conditions. NRCS mapping consists of a minimum 3 acres map unit and soils may vary substantially within each mapping unit. Test pits should be dug in areas planned for infiltration practices to verify soil suitability and/or limitations.

- Investigation of areas of compacted soils and the utilization of proper construction staging. Planning should insure that areas to be used for infiltration are not compacted during the construction process by vehicles or machinery.

Even if infiltration is limited at a site, it is still possible to implement LID practices. Specifically, potential exists for the installation of green roofs on buildings and/or the use of cisterns to capture and reuse rainwater.

LID in Areas with a High Seasonal Water Table or Hardpan Layer

- The impact of stormwater runoff to any streams and/or wetlands near the site should be considered. Water quality treatment is influenced by hydraulic conductivity and time of travel. If stormwater infiltration is limited by an impermeable layer close to the surface, the water may run laterally through the ground and discharge to the stream or wetlands, providing limited water quality treatment. However, a longer time of travel may provide sufficient treatment. Proper soil testing for infiltration potential will increase the likelihood of successful BMP design.

- In areas with a high seasonal water table, bioretention areas/rain gardens should be planted with water tolerant/wetland plants. The presence of a high seasonal water table suggests that water may drain slowly or not at all during certain parts of the year. Planting native wetland vegetation will help to ensure plant survival and increase the effectiveness of bioretention practices. Information on native plantings that are both drought tolerant and tolerant of wet conditions can be found in The UConn Cooperative Extension System's guide to building a rain garden at http://nemo.uconn.edu/publications/rain_garden_broch.pdf. Native plant lists for Connecticut can also be found at http://www.fhwa.dot.gov/environment/rdsduse/ct.htm.

LID Guidance for Federal Projects

- LID techniques have been utilized by Department of Defense (DoD) agencies during the last several years. The effectiveness of these projects in managing runoff as well as reducing construction and maintenance costs has created significant interest in LID. The DoD has created a Unified Facilities Criteria document, Low Impact Development that provides guidelines for integrating LID planning and design into a facility's regulatory and resource protection programs. It is available on-line at: http://www.wbdg.org/ccb/DOD/UFC/ufc_3_210_10.pdf.

- Section 438 of the Energy Independence and Security Act (EISA) of 2007 requires federal agencies to reduce stormwater runoff from federal development projects to protect water resources. In December 2009, the EPA developed a technical guidance document on implementing the stormwater runoff requirements for federal projects under Section 438 of EISA. The document contains guidance on how compliance with Section 438 can be achieved, measured and evaluated and can be found at: http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf.

For more information contact the CT DEEP Watershed Management/Low Impact Development Program call (860)424-3716.

List of Runoff Reduction/LID Practices

Re-Forestation
Disconnection of Rooftop Runoff
Disconnection of Non-Rooftop Runoff
Sheetflow to Conservation Areas
Green Roof
Permeable Pavement
Rainwater Harvesting
Submerged Gravel Wetlands
Micro-Infiltration
Rain Gardens
Bioretention
Landscape Infiltration
Grass Swales
Bio-swales
Wet Swales
Stormwater Ponds
Stormwater Wetlands
Stormwater Filtering Systems
Stormwater Infiltration

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX C

AQUIFER PROTECTION AREAS AND OTHER GROUNDWATER DRINKING SUPPLY AREAS GUIDANCE INFORMATION

The Stormwater Pollution Control Plan ("the Plan") shall consider measures to reduce or mitigate potential impacts to both ground water (aquifers) and surface waters, taking into consideration both quantity and quality of the runoff. The emphasis should be to minimize, to the extent possible, changes between pre-development and post-development runoff rates and volumes.

The basic stormwater principals for Aquifer Protection Areas (and other groundwater drinking supply areas) are to prevent inadvertent pollution discharges/releases to the ground, while encouraging recharge of stormwater where it does not endanger groundwater quality. Measures include:

- prevent illicit discharges to storm water, including fuel/chemical pollution releases to the ground;
- minimize impervious coverage and disconnect large impervious areas with natural or landscape areas;
- direct paved surface runoff to aboveground type land treatment structures – sheet flow, surface swales, depressed grass islands, detention/retention and infiltration basins, and wet basins. These provide an opportunity for volatilization of volatile organic compounds to the extent possible before the stormwater can infiltrate into the ground;
- provide necessary impervious pavement in high potential pollutant release areas. These "storm water hot spots" include certain land use types or storage and loading areas, fueling areas, intensive parking areas and roadways (see table below);
- only use subsurface recharge structures such as dry wells, galleries, or leaching trenches, to directly infiltrate clean runoff such as rooftops, or other clean surfaces. These structures do not adequately allow for attenuation of salts, solvents, fuels or other soluble compounds in groundwater that may be contained in runoff; and
- restrict pavement deicing chemicals, or use an environmentally suitable substitute such as sand only, or alternative de-icing agents such as calcium chloride or calcium magnesium.

Infiltration of stormwater should be **restricted** under the following site conditions:

- ***Land Uses or Activities with Potential for Higher Pollutant Loads:*** Infiltration of stormwater from these land uses or activities (refer to Table 7-5 below), also referred to as stormwater "hotspots," can contaminate public and private groundwater supplies. Infiltration of stormwater from these land uses or activities may be allowed by the review authority with appropriate pretreatment. Pretreatment could consist of one or a combination of the primary or secondary treatment practices described in the Stormwater Quality Manual provided that the treatment practice is designed to remove the stormwater contaminants of concern.

- ***Subsurface Contamination:*** Infiltration of stormwater in areas with soil or groundwater contamination such as brownfield sites and urban redevelopment areas can mobilize contaminants.

- ***Groundwater Supply and Wellhead Areas:*** Infiltration of stormwater can potentially contaminate groundwater drinking water supplies in immediate public drinking water wellhead areas.

Land Uses or Activities with Potential for Higher Pollutant Loads
Table 7-5 of the 2004 Stormwater Quality Manual

Land Use/Activities	
• Industrial facilities subject to the DEEP Industrial Stormwater General Permit or the U.S. EPA National Pollution Discharge Elimination System (NPDES) Stormwater Permit Program • Vehicle salvage yards and recycling facilities • Vehicle fueling facilities (gas stations and other facilities with on-site vehicle fueling) • Vehicle service, maintenance, and equipment cleaning facilities • Fleet storage areas (cars, buses, trucks, public works) • Commercial parking lots with high intensity use (shopping malls, fast food restaurants, convenience stores, supermarkets, etc.) • Public works storage areas	• Road salt storage facilities (if exposed to rainfall) • Commercial nurseries • Flat metal rooftops of industrial facilities • Facilities with outdoor storage and loading/unloading of hazardous substances or materials, regardless of the primary land use of the facility or development • Facilities subject to chemical inventory reporting under Section 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA), if materials or containers are exposed to rainfall • Marinas (service and maintenance) • Other land uses and activities as designated by the review authority

For further information regarding the design of stormwater collection systems in Aquifer Protection Areas, contact the Aquifer Protection Area Program at (860) 424-3020 or visit www.ct.gov/deep/aquiferprotection.

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX D

Coastal Management Act Determination Form

For sites within the Coastal Boundary, please attach this form and written approval from the local governing authority (or verification of exemption) to the Registration Form for the Discharge of Stormwater and Dewatering Wastewaters From Construction Activities.

SITE INFORMATION

Future Permittee _____

Mailing Address _____

Business Phone _____ ext.: _____ Fax: _____

Contact Person _____ Title: _____

Site Name _____

Site Address/ Location _____

Site Latitude and Longitude _____

Receiving Water (name, basin) _____

Project Description _____

_____

STATEMENT OF REVIEW:

The above referenced project is consistent with the goals and policies in section 22a-92 of the Connecticut General Statutes and will not cause adverse impacts to coastal resources as defined in section 22a-93(15) of the Connecticut General Statutes.

Date of Coastal Site Plan Approval: _____

☐ Copy of written approval attached, or

☐ Verification of exemption attached

Memorandum of Agreement
Between
The Connecticut Department of Energy & Environmental Protection
and the
the Five Conservation Districts of Connecticut
for
Technical Assistance for Locally Approvable Stormwater Construction General Permits

WHEREAS, the Commissioner of the Department of Energy and Environmental Protection ("Department" or "DEEP ") is authorized by section 22a-6(a)(2)(3) and (4) of the Connecticut General Statutes ("CGS") to enter into this Agreement; and

WHEREAS, the five Conservation Districts of Connecticut (collectively, the "Districts"), are not-for-profit corporations duly authorized, organized and existing under the laws of the State of Connecticut and are authorized by section 22a-315 of the CGS and section 22a-315-14 of the Regulations of Connecticut State Agencies to enter into this Agreement; and

WHEREAS, section 22a-430b of the Connecticut General Statutes authorizes the Department to regulate stormwater discharges from construction activities under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities ("the Construction General Permit" or "CGP"), which has been or shall be issued on October 1, 2019. The Construction General Permit requires the implementation of erosion and sediment controls to control the discharge of sediment from construction and post-construction discharges; and

WHEREAS, Construction General Permits require the preparation and implementation of a Stormwater Pollution Control Plan ("Plan" or "SWPCP") to prevent erosion and the discharge of sediment to the waters of the state; and

WHEREAS, pursuant to section 22a-315 of the CGS, soil and water conservation districts and boards were established to advise the Commissioner on matters of soil and water conservation and erosion and sediment control and to assist the Commissioner in implementing programs related to soil and water conservation and erosion and sediment control; and

WHEREAS, pursuant to section 22a-315 of the CGS, the soil and water conservation districts and boards may receive funds from private sources for services provided to promote soil and water conservation and to assist the Commissioner in the implementation of related programs; and

WHEREAS, section 22a-326 of the CGS declares the policy of the state "to strengthen and extend its erosion and sediment control activities and programs and to establish and implement, through the Council on Soil and Water Conservation, soil and water conservation districts, the municipalities and the Commissioner of Energy and Environmental Protection, a state-wide coordinated erosion and sediment control program which shall reduce the danger from storm water runoff, minimize nonpoint sediment pollution from land being developed and conserve and protect the land, water, air and other environmental resources of the state;" and

WHEREAS, the Districts have understanding and experience in reviewing erosion and sediment control plans because of their longstanding participation in the municipal approval process, as required by section 22a-329 of the CGS; and

WHEREAS, DEEP and the Districts are jointly dedicated to protecting the waters of the state by controlling the discharge of sediment and the pollution resulting from stormwater runoff.

NOW, THEREFORE, in consideration of the mutual covenants and conditions hereinafter stated, the Parties agree as follows:

Special Conditions

I. REQUIREMENTS FOR TECHNICAL ASSISTANCE BY DISTRICTS

A. SWPCP technical assistance shall be conducted by a District representative having one or more of the following minimum qualifications: (i) a bachelor's degree in hydrology, engineering (agricultural, civil, environmental, or chemical), landscape architecture, geology, soil science, environmental science, natural resources management, or a related field and two years of professional and field experience, or (ii) the EnviroCert International, Inc. designation as a Certified Professional in Erosion and Sediment Control (CPESC), Certified Erosion, Sediment and Stormwater Inspector (CESSWI), or a Certified Professional in Stormwater Quality (CPSWQ).

B. All technical assistance on SWPCPs undertaken by a District shall be conducted in accordance with the guidelines and procedures established by DEEP in consultation with the Districts, as further described below.

II. LOCALLY APPROVABLE PROJECTS

For locally approvable projects, as defined in the Construction General Permit, with five (5) or more acres of soil disturbance, the appropriate District (as indicated in Exhibit 2 of this agreement) shall review Stormwater Pollution Control Plans submitted to the District in accordance with Section 3(*b*)(10) of the CGP, shall determine whether each such SWPCP is consistent with the requirements of the CGP, and shall advise the Commissioner in writing of its determination regarding the SWPCP's consistency. The appropriate District may request assistance from another District or re-assign a project to another District upon mutual consent of the Districts. The Commissioner will be notified in writing of any re-assignment.

A. Components of the SWPCP Review by the Districts

1. Requirements for Conducting a Review:

   The District shall begin a SWPCP review upon the receipt of the all of following: the developer's request for review, two hard copies and a digital copy of the proposed SWPCP, a non-refundable down payment from the permittee as per the Fee Schedule in Exhibit 1 and the written permission of the developer to enter onto and inspect the project site. Once the District is in receipt of all the documents and the fee as delineated above, the developer's SWPCP shall be considered submitted to the District.

2. Determinations of Consistency by the District after Review of the SWPCP and Subsequent Procedures

   (a) If the District determines the developer's SWPCP is:

   (i) Consistent with the requirements of the Construction General Permit, the District shall issue an affirmative determination notice to both the developer or such developer's designee and to DEEP in order to advise them of the adequacy of the SWPCP. The District shall also provide a copy of the SWPCP to DEEP if requested by the Commissioner.

   (ii) Not consistent with the requirements of the Construction General Permit, the District shall provide a written notice of such inconsistency to the developer or such developer's designee; such notice shall include a list of the SWPCP's deficiencies and any appropriate explanatory comments.

(b) If the developer's SWPCP is found to be inconsistent with the CGP, the developer may revise the SWPCP (the "Revised SWPCP") to address any deficiencies noted by the District and resubmit its Revised SWPCP to the District for review.

(c) If the District receives a Revised SWPCP in accordance with subsection (b) above, the District shall perform a review of the Revised SWPCP. If the Revised SWPCP is deemed:

(i) Consistent with the requirements of the Construction General Permit, the District shall (1) issue an affirmative determination notice to both the project developer or such project developer's designee and to DEEP to advise them of the adequacy of the SWPCP and (2) provide a copy of the SWPCP to the DEEP if requested by the Commissioner; or

(ii) Not consistent with the requirements of the CGP after this review, the District shall provide a written notice of such inconsistency to the developer or such developer's designee. This notice shall include a list of all remaining SWPCP deficiencies and any explanatory comments as appropriate.

(d) In the event the District determines after review of the Revised SWPCP in accordance with subsection (c), above, that the Revised SWPCP remains inconsistent with the requirements of the Construction General Permit, the developer shall continue to resubmit a Revised SWPCP in accordance with subsection (c), above, until such time as the District determines that the SWPCP is consistent with the requirements of the Construction General Permit and issues an affirmative determination notice. As such, the resubmitted Revised SWPCP shall be reviewed by the District in accordance with the timeframes set forth in Section II.B., and other applicable sections of this document, and the fee shall remain in accordance with the Fee Schedule in Exhibit 1.

(e) Revisions to a SWPCP subsequent to the District's prior approval of developer's SWPCP

In the event the developer revises a SWPCP after the District has determined that the developer's SWPCP, prior to this revision, was consistent with the requirements of the Construction General Permit, the SWPCP shall be considered a Post-Approval Resubmission. In such a case, the District shall review the SWPCP in accordance with the timeframes set forth in Section II.B., and other applicable sections of this document, and the fee shall be in accordance with the Fee Schedule in Exhibit 1.

B. Plan Review Timeframes

1. The District shall review a new submission of a SWPCP submitted by a developer or such developer's designee and provide review comments or issue an affirmative determination notice within thirty (30) calendar days of the date of a complete submission as specified in Section II.A.1.

2. If the District identifies deficiencies in the SWPCP, the District shall allow the developer or such developer's designee the opportunity to revise their SWPCP and resubmit it to the District within fifteen (15) calendar days after the date of mailing or delivery of the District's written comments to the developer or such developer's designee.

3. The District shall review any SWPCP revised in accordance with subsection II.B.2., above, and provide a written determination of the SWPCP's consistency or inconsistency within fifteen (15) calendar days after the submission of the revised SWPCP. Subsequent resubmissions of a revised SWPCP shall be in accordance with the same timeframes.

4. At the request of the District or the developer and with the agreement of both the District and the developer, the deadlines stated in subsections 1. – 3., above, may be extended. However, any such

extensions shall be limited to no more than double the original amount of time allowed above for the relevant action.

5. Expedited review of a SWPCP may be requested by a developer. However, the Districts shall have complete discretion to accept or decline such request for an expedited review based on the District's circumstances, including, but not limited to: their existing workload, vacation schedules and staffing. If a District grants an expedited review, the timeframe shall be reduced to no more than one third of the timeframes noted in subsection 1. – 3., above, and the fee and non-refundable down payment shall be twice those amounts listed in Exhibit 1.

6. In the event a District does not complete the review of the SWPCP within sixty (60) days (or within the time allowed under any resubmissions or authorized extension pursuant to subsections B.3 and B.4, above, but in no circumstance later than 120 days) of the date the SWPCP was initially submitted to the District, and provided such delay is not the result of the developer's or such developer's designee's failure to address SWPCP deficiencies as noted in subsection B.2, above, the District shall:

   (a) not later than three (3) days after the District's deadline, notify the DEEP that the developer shall be initiating the registration process for the Construction General Permit in accordance with section II.B of this Agreement, for completion of the SWPCP review, and;

   (b) provide to the DEEP, upon request, the District's complete file, including supporting documentation the developer's SWPCP consistency determination, including, but not limited to, the SWPCP, any other documentation submitted to the District by or on behalf of a developer, and any analysis already performed by the District; and

   (c) not later than seven (7) days after the District's deadline, in accordance with section II.B of this Agreement, for completion of the SWPCP review, transfer to the DEEP all fees that were originally submitted by the developer.

C. Inspections of the Project Site

1. Prior to the commencement of project construction and during the course of the SWPCP review process, the District shall conduct at least one inspection of the project site.

2. Once the construction of the project has begun, the District shall make at least one, but not more than three, inspection(s) of the project site to verify that the developer's SWPCP is being implemented as approved by the District. The District shall report the results of the inspection(s) to the developer or such developer's designee and to DEEP in a manner prescribed by the Commissioner.

3. Upon notification from the developer or developer's designee, in accordance with Section 6(a)(1) of the CGP, that construction of the stormwater collection and management system is complete, the District shall conduct one inspection of the project site to verify that the post-construction stormwater management measures were completed in accordance with the approved SWPCP. The District shall report the results of this inspection to DEEP in a manner prescribed by the Commissioner.

D. Audits

The District agrees that all records pertaining to this Agreement shall be maintained for a period of not less than five (5) years. Such records shall be made available to the DEEP and to the state auditors upon request. For the purposes of this Agreement, "Records" are all working papers and such information and materials as may have been accumulated by the District in performing the Agreement, including, but not limited to, documents, data, analysis, plans, books, computations, drawings, specifications, notes, reports, records, estimates, summaries and correspondence, kept or stored in any form.

III. FEE SCHEDULE.

A. A District may assess fees for the services it renders in conjunction with its SWPCP reviews. Such fees shall be assessed in accordance with the Fee Schedule in Exhibit 1. All fees shall be submitted by the developer to the District with the developer's request for review and inspections. These fees are non-refundable.

B. The Fee Schedule shall be reviewed annually by the Parties. The Fee Schedule may be adjusted as warranted, without a formal amendment to this Agreement, by mutual agreement between the Districts and the Commissioner.

IV. RESPONSIBILITIES OF DEEP.

A. In accordance with the Construction General Permit requirements for SWPCP reviews of locally approvable projects by a third party, DEEP shall conduct outreach to inform the development community that a District may review SWPCPs for consistency with the requirements of the Construction General Permit. DEEP shall also inform the development community that a registration form for authorization of a locally approvable project under the Construction General Permit may only be submitted to DEEP if: the District, or other third party in accordance with Section 3(b)(11) of the CGP, determines that the SWPCP is consistent with the requirements of the CGP, or in the event the time schedule is exceeded for a District review as described in section II.B.6, above.

B. In order to institute standard SWPCP review guidelines and procedures, DEEP shall coordinate with the Districts to prepare a SWPCP checklist. The standard review guidelines and procedures established shall be consistent with the requirements of the Construction General Permit, the 2002 CT Guidelines for Soil Erosion and Sediment Control, and the 2004 Stormwater Quality Manual, as respectively amended. The Commissioner shall have final approval of the review guidelines and procedures.

C. DEEP shall provide initial training regarding SWPCP requirements for District staff involved in SWPCP reviews. The frequency of subsequent training shall be determined by the Commissioner.

D. DEEP shall retain final decision making authority regarding the determination that a SWPCP is or is not consistent with the requirements of the Construction General Permit and shall oversee the permitting process for Construction General Permit coverage.

E. Once a SWPCP has been approved, DEEP shall oversee any subsequent compliance and/or enforcement matters related to a developer's adherence to the requirements of the Construction General Permit.

F. DEEP shall have the discretion to review any of the Districts' records pertaining to any aspect this Agreement.

V. POINTS OF CONTACT.

The following shall be points of contact for this Agreement unless otherwise agreed to by all Parties, notwithstanding section VI. All notices, demands, requests, consents, approvals or other communications required or permitted to be given or which are given with respect to this Agreement (for the purpose of this section collectively called "Notices") shall be deemed to have been effected at such time as the notice is placed in the U.S. mail, first class and postage prepaid, return receipt requested, or, placed with a recognized, overnight express delivery service that provides for a return receipt. All such Notices shall be in writing and shall be addressed as follows:

A. DEEP
Director
Water Permitting & Enforcement Division
Bureau of Material Management & Compliance Assurance
Department of Energy & Environmental Protection
79 Elm St.
Hartford, CT 06106
Phone: 860-424-3018
Fax: 860-424-4074

B. Conservation District
Board Chairperson
Address & Phone of appropriate District:

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790
Ph: 860-626-7222
Fax: 860-626-7222
Email: info@nwcd.org

Eastern Connecticut Conservation District
238 West Town Street
Norwich, CT 06360-2111
Ph**:** 860-319-8806
Email: Dan.Mullins@comcast.net

Connecticut River Coastal Conservation District, Inc.
deKoven House Community Center
27 Washington Street
Middletown, CT 06457
Ph: 860-346-3282
Email: ctrivercoastal@conservect.org

Southwest Conservation District
51 Mill Pond Road
Hamden, CT 06514
Ph: 203-859-7014
Email: csullivan@conservect.org

North Central Conservation District
24 Hyde Avenue
Vernon, CT 06066
Ph: 860-875-3881
Email: tollandc@snet.net

General Conditions

VI. EXECUTIVE ORDERS AND ANTI-DISCRIMINATION. This Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which

are incorporated into and are made a part of the Contract as if they had been fully set forth in it. The Contract may also be subject to Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services and to Executive Order No. 49 of Governor Dannel P. Malloy, promulgated May 22, 2015, mandating disclosure of certain gifts to public employees and contributions to certain candidates for office. If Executive Order 14 and/or Executive Order 49 are applicable, they are deemed to be incorporated into and are made a part of the Contract as if they had been fully set forth in it. At the Contractor's request, the Client Agency or DAS shall provide a copy of these orders to the Contractor.

VII. AMENDMENTS. Either the DEEP or the Districts may recommend revisions to this Agreement as circumstances may warrant; however, any revisions must be upon mutual agreement of DEEP and all five Conservation Districts. Unless otherwise stated in this Agreement, formal written amendment is required for changes to any of the terms and conditions specifically stated in the Agreement, any prior amendments to the Agreement, and any other Agreement revisions determined material by the Department.

VIII. SEVERABILITY. The provisions of this Agreement are severable. If any part of it is found unenforceable, all other provisions shall remain fully valid and enforceable, unless the unenforceable provision is an essential element of the bargain.

IX. SOVEREIGN IMMUNITY. The Parties acknowledge and agree that nothing in the Agreement shall be construed as a modification, compromise or waiver by the State of any rights or defenses of any immunities provided by federal law or the laws of the State of Connecticut to the State or any of the State's, which they may have had, now have or shall have with respect to all matters arising out of the Agreement. To the extent that this section conflicts with any other section, this section shall govern.

X. FORUM AND CHOICE OF LAW. The Agreement shall be deemed to have been made in the City of Hartford, State of Connecticut. Both Parties agree that it is fair and reasonable for the validity and construction of the Agreement to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by federal law or the laws of the State of Connecticut do not bar an action against the State or the Districts, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Districts waive any objection which they may now have or shall have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

XI. TERMINATION. Notwithstanding any provisions in this Agreement, DEEP, through a duly authorized employee, may terminate the Agreement whenever the Agency makes a written determination that such Termination is in the best interests of the State. The Agency shall notify the Districts in writing sent by certified mail, return receipt requested, which notice shall specify the effective date of Termination and the extent to which the Districts must complete its Performance under the Agreement prior to such date; or (b) The Districts may terminate the Agreement for good cause. The Districts shall notify DEEP by written notice at least one hundred eighty (180) days prior to the effective date of termination. In order for the Districts to terminate this Agreement, (1) there must be a consensus between all five Conservation Districts that each District shall be terminating this Agreement with the DEEP; (2) such proof of consensus shall be submitted to the DEEP in the form of a letter signed by the duly authorized agent for each District by certified mail, return receipt requested, at least one hundred eighty (180) days prior to the Districts' intention to cancel or terminate. Upon the Termination of this Agreement by either Party, the Districts shall deliver to the Agency copies of all Records no later than thirty (30) days after the Termination of the Agreement, or fifteen (15) days after the Non-terminating Party receives a written request from the Terminating Party for the Records. The Districts shall deliver those Records that exist in electronic, magnetic or other intangible form in a non-proprietary format, such as, but not limited to, PDF, ASCII or .TXT. Upon receipt of a written notice of

Termination from the Agency, the Districts shall cease operations as the Agency directs in the notice, and take all actions that are necessary or appropriate, or that the Agency may reasonably direct, for the protection, and preservation of records. Except for any work which the Agency directs the Districts to Perform in the notice prior to the effective date of Termination, and except as otherwise provided in the notice, the Districts shall terminate or conclude all existing subcontracts and purchase orders and shall not enter into any further subcontracts, purchase orders or commitments. Upon Termination of the Agreement, all rights and obligations shall be null and void, so that no Party shall have any further rights or obligations to any other Party, except with respect to the sections which survive Termination. All representations, warranties, agreements and rights of the Parties under the Agreement shall survive such Termination to the extent not otherwise limited in the Agreement and without each one of them having to be specifically mentioned in the Agreement. Termination of the Agreement pursuant to this section shall not be deemed to be a breach of Agreement by the Agency.

XII. DURATION OF AGREEMENT. This Agreement shall be effective on July 1, 2019 or on the date of the last signature below, whichever is later, and shall continue in force unless canceled or terminated by either party in accordance with paragraph XI above.

XIII. VOID AB INITIO. Notwithstanding paragraphs XI and XII, the Agreement shall be void *ab initio* if the Construction General Permit is reissued, revoked or modified to eliminate the need for the Districts to review the SWPCP pursuant to such general permit's terms and conditions or if the Construction General Permit expires and is not reissued.

XIV. INTERPRETATION. The Agreement contains numerous references to statutes and regulations. For purposes of interpretation, conflict resolution and otherwise, the content of those statutes and regulations shall govern over the content of the reference in the Agreement to those statutes and regulations.

XV. ENTIRETY OF AGREEMENT. This Agreement is the entire agreement between the Parties with respect to its subject matter, and supersedes all prior agreements, proposals, offers, counteroffers and understandings of the Parties, whether written or oral. The Agreement has been entered into after full investigation, neither Party relying upon any statement or representation by the other unless such statement or representation is specifically embodied in the Agreement.

XVI. PROTECTION OF STATE CONFIDENTIAL INFORMATION.

A. The Districts or District Parties, at their own expense, have a duty to and shall protect from a Confidential Information Breach any and all Confidential Information which they come to possess or control, wherever and however stored or maintained, in a commercially reasonable manner in accordance with current industry standards. Confidential Information is any information that a party claims to be exempt from the state Freedom of Information Act (Section 1-210 et seq of the Connecticut General Statutes, also called FOIA) as specified in that Act.

B. Each District or District Party shall develop, implement and maintain a comprehensive data-security program for the protection of Confidential Information. The safeguards contained in such program shall be consistent with and comply with the safeguards for protection of Confidential Information, and information of a similar character, as set forth in all applicable federal and state law and written policy of the Department or State concerning the confidentiality of Confidential Information. Such data-security program shall include, but not be limited to, the following:

1. A security policy for employees related to the storage, access and transportation of data containing Confidential Information;

2. Reasonable restrictions on access to records containing Confidential Information, including access to any locked storage where such records are kept;

3. A process for reviewing policies and security measures at least annually;

4. Creating secure access controls to Confidential Information, including but not limited to passwords; and

5. Encrypting of Confidential Information that is stored on laptops, portable devices or being transmitted electronically.

C. The District and District Parties shall notify the Department and the Connecticut Office of the Attorney General as soon as practical, but no later than twenty-four (24) hours, after they become aware of or suspect that any Confidential Information which Parties have come to possess or control has been subject to a Confidential Information Breach. If a Confidential Information Breach has occurred, the District shall, within three (3) business days after the notification, present a credit monitoring and protection plan to the Commissioner of Administrative Services, the Department and the Connecticut Office of the Attorney General, for review and approval. Such credit monitoring or protection plan shall be made available by the District at its own cost and expense to all individuals affected by the Confidential Information Breach. Such credit monitoring or protection plan shall include, but is not limited to, reimbursement for the cost of placing and lifting one (1) security freeze per credit file pursuant to Connecticut General Statutes §36a-701a. Such credit monitoring or protection plans shall be approved by the State in accordance with this Section and shall cover a length of time commensurate with the circumstances of the Confidential Information Breach. The District's costs and expenses for the credit monitoring and protection plan shall not be recoverable from the Department, any State of Connecticut entity or any affected individuals.

D. The District shall incorporate the requirements of this Section in all subAgreements requiring each District Party to safeguard Confidential Information in the same manner as provided for in this Section.

E. Nothing in this Section shall supersede in any manner the District's and/ or the District Parties' obligations pursuant to HIPAA or the provisions of this Agreement concerning the obligations of the District as a Business Associate of the Department.

XVII. AMERICANS WITH DISABILITIES ACT. The Districts shall be and remain in compliance with the Americans with Disabilities Act of 1990 ("Act"), to the extent applicable, during the term of the Agreement. The DEEP may cancel the Agreement if the District and District Parties fail to comply with the Act.

XVIII. ADA PUBLICATION STATEMENT. The following statement shall be incorporated into all **publications** prepared under the terms of this Agreement:

"The Department of Energy and Environmental Protection is an affirmative action/equal opportunity employer and service provider. In conformance with the Americans with Disabilities Act, DEEP makes every effort to provide equally effective services for persons with disabilities. Individuals with disabilities who need this information in an alternative format, to allow them to benefit and/or participate in the agency's programs and services, should call DEEP's Human Resources Office at (860) 424-3006, send a fax to (860) 424-3896, or email DEEP.MedRecs@ct.gov. Persons who are hearing impaired should call the State of Connecticut relay number 711."

When advertising any **public meetings** conducted under the terms of this Agreement, the above publications language should be used as well as the following statement:

"Requests for accommodations must be made at least two weeks prior to the program date."

All **videos** produced under the terms of this Agreement must be made available with closed captioning.

XIX. PUBLICATION OF MATERIALS. The District must obtain written approval from the State of Connecticut prior to distribution or publication of any printed material prepared under the terms of this Agreement. Unless specifically authorized in writing by the State, on a case by case basis, the District shall have no right to use, and shall not use, the name of the State of Connecticut, its officials, agencies, or employees or the seal of the State of Connecticut or its agencies: (1) in any advertising, publicity, promotion; or (2) to express or to imply any endorsement of District's products or services; or (3) to use the name of the State of Connecticut, its officials agencies, or employees or the seal of the State of Connecticut or its agencies in any other manner (whether or not similar to uses prohibited by (1) and (2) above), except only to manufacture and deliver in accordance with this Agreement such items as are hereby contracted for by the State. In no event may the Districts use the State Seal in any way without the express written consent of the Secretary of State.

XX. CHANGES IN PRINCIPAL PROJECT STAFF. Any changes in District staff qualified to review Plans must be requested in writing and approved in writing by the Commissioner at the Commissioner's sole discretion. In the event of any unapproved change in District staff, the Commissioner may, in the Commissioner's sole discretion, terminate this Agreement.

XXI. FURTHER ASSURANCES. The Parties shall provide such information, execute and deliver any instruments and documents and take such other actions as may be necessary or reasonably requested by the other Party which are not inconsistent with the provisions of this Agreement and which do not involve the vesting of rights or assumption of obligations other than those provided for in the Agreement, in order to give full effect to the Agreement and to carry out the intent of the Agreement.

XXII. ASSIGNMENT. The Districts shall not assign any of their rights or obligations under the Agreement, voluntarily or otherwise, in any manner without the prior written consent of the Agency. The Agency may void any purported assignment in violation of this section and declare the District in breach of this Agreement. Any termination by the Agency for a breach is without prejudice to the Agency's or the State's rights or possible Claims.

XXIII. EXHIBITS. All exhibits referred to in, and attached to, this Agreement are incorporated in this Agreement by such reference and shall be deemed to be a part of it as if they had been fully set forth in it.

XXIV. FORCE MAJEUR. Events that materially affect the cost of the Goods or Services or the time schedule within which to Perform and are outside the control of the party asserting that such an event has occurred, including, but not limited to, labor troubles unrelated to District(s), failure of or inadequate permanent power, unavoidable casualties, fire not caused by a District, extraordinary weather conditions, disasters, riots, acts of God, insurrection or war.

XXV. INDEMNIFICATION. The Districts shall indemnify, defend and hold harmless the State and its officers, representatives, agents, servants, employees, successors and assigns from and against any and all (1) Claims arising, directly or indirectly, in connection with the Agreement, including the acts of commission or omission (collectively, the "Acts") of the District or District Parties; and (2) liabilities, damages, losses, costs and expenses, including but not limited to, attorneys' and other professionals' fees, arising, directly or indirectly, in connection with Claims, Acts or the Agreement. The Districts obligations under this section to indemnify, defend and hold harmless against Claims includes Claims concerning confidentiality of any part of or all of the Districts' Records, any intellectual property rights, other proprietary rights of any person or entity, copyrighted or uncopyrighted compositions, secret processes, patented or unpatented inventions, articles or appliances furnished or used in the Performance. The Districts shall not be responsible for indemnifying or holding the State harmless from any liability arising due to the negligence of the State or any other person or entity acting under the direct control or supervision of the State. The Districts shall reimburse the State for any and all damages to the real or personal property of the State caused by the Acts of the Districts or any District Parties. The State shall give the Districts reasonable notice of any such Claims. The Districts shall carry and maintain at all times during the term of the Agreement, and during the time that any

provisions survive the term of the Agreement, sufficient general liability insurance to satisfy its obligations under this Agreement. The Districts shall name the State as an additional insured on the policy and shall provide a copy of the policy to the Agency prior to the effective date of the Agreement. The Districts shall not begin Performance until the delivery of the policy to the Agency. The Agency shall be entitled to recover under the insurance policy even if a body of competent jurisdiction determines that the Agency or the State is contributorily negligent. This section shall survive the Termination of the Agreement and shall not be limited by reason of any insurance coverage.

XXVI. DISTRICT PARTIES. A District's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the District is in privity of oral or written contract and the District intends for such other person or entity to Perform under the Agreement in any capacity

XXVII. CAMPAIGN CONTRIBUTION RESTRICTION. For all State contracts as defined in P.A. 07-1 having a value in a calendar year of $50,000 or more or a combination or series of such agreements or contracts having a value of $100,000 or more, the authorized signatory to this Agreement expressly acknowledges receipt of the State Elections Enforcement Commission's notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice. See SEEC Form 11.

Authorizing Signatures

For DEEP: _____ 10/8/19
Katherine S. Dykes, Commissioner — Date

For Northwest Conservation District: Laura M Russell 08/19/2019
Signature — Date

Vice-Chairman
Title

For Eastern Connecticut Conservation District: _____ 8/14/19
Signature — Date

Chairman
Title

For Connecticut River Coastal Conservation District, Inc.: _____ 8/6/19
Signature — Date

CHAIRMAN
Title

For Southwest Conservation District: _____ 8-9-19
Signature — Date

Chairwoman
Title

For North Central Conservation District: _____ 8-6-2019
Signature — Date

Vice Chair
Title

Title

Exhibit 1

Fee Schedule

The Districts will be paid $120/hour for technical assistance work performed.

Non-refundable down payments required with submission:
$2,500 for sites ≤ 20 acres
$4,000 for sites > 20 acres

Exhibit 2

Conservation Districts of Connecticut
Regional Delineations and Contact Information

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790
Ph: 860-626-7222
Fax: 860-626-7222
Email: info@nwcd.org

Eastern Connecticut Conservation District
238 West Town Street
Norwich, CT 06360-2111
Ph**:** 860-319-8806
Email: Dan.Mullins@comcast.net

Connecticut River Coastal Conservation District, Inc.
deKoven House Community Center
27 Washington Street
Middletown, CT 06457
Ph: 860-346-3282Email: ctrivercoastal@conservect.org

Southwest Conservation District
51 Mill Pond Road
Hamden, CT 06514
Ph: 203-859-7014
Email: csullivan@conservect.org

North Central Conservation District
24 Hyde Avenue
Vernon, CT 06066
Ph: 860-875-3881
Email: tollandc@snet.net

NORTHWEST	SOUTHWEST	NORTH CENTRAL	CT RIVER COASTAL	EASTERN
Barkhamsted	Ansonia	Avon	Berlin	Andover
Bethel	Beacon Falls	Bloomfield	Chester	Ashford
Bethlehem	Bethany	Bolton	Clinton	Bozrah
Bridgewater	Branford	Bristol	Colchester	Brooklyn
Brookfield	Bridgeport	Burlington	Cromwell	Canterbury
Canaan	Cheshire	Canton	Deep River	Chaplin
Colebrook	Darien	Coventry	Durham	Columbia
Cornwall	Derby	East Granby	East Haddam	Eastford
Danbury	East Haven	East Hartford	East Hampton	East Lyme
Goshen	Easton	East Windsor	Essex	Franklin
Hartland	Fairfield	Ellington	Haddam	Griswold
Harwinton	Greenwich	Enfield	Hebron	Groton
Kent	Guilford	Farmington	Killingworth	Hampton
Litchfield	Hamden	Glastonbury	Lyme	Killingly
Morris	Meriden	Granby	Madison	Lebanon
New Fairfield	Middlebury	Hartford	Marlborough	Ledyard
New Hartford	Milford	Manchester	Middlefield	Lisbon
New Milford	Monroe	Plainville	Middletown	Mansfield
Newtown	Naugatuck	Simsbury	Newington	Montville
Norfolk	New Canaan	Somers	New Britain	New
North Canaan	New Haven	South Windsor	Old Lyme	London
Plymouth	North Branford	Stafford	Old Saybrook	North
Roxbury	North Haven	Suffield	Portland	Stonington
Salisbury	Norwalk	Tolland	Rocky Hill	Norwich
Sharon	Orange	Vernon	Salem	Plainfield
Sherman	Oxford	West Hartford	Westbrook	Pomfret
Southbury	Prospect	Wethersfield		Preston
Thomaston	Redding	Willington		Putnam
Torrington	Ridgefield	Windsor		Scotland
Warren	Seymour	Windsor Locks		Sprague
Washington	Shelton			Sterling
Watertown	Southington			Stonington
Winchester	Stamford			Thompson
Woodbury	Stratford			Union
	Trumbull			Voluntown
	Wallingford			Waterford
	Waterbury			Windham
	West Haven			Woodstock
	Weston			
	Westport			
	Wilton			
	Wolcott			
	Woodbridge			

Exhibit 3

CONSERVATION DISTRICT PLAN REVIEW CERTIFICATION

Registrations submitted to DEEP for which a Conservation District has performed the Plan review pursuant to Section 3(*b*)(10) of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities shall include the following certification:

"I hereby certify that I am an employee of the [INSERT NAME OF DISTRICT] Conservation District and that I meet the qualifications to review Stormwater Pollution Control Plans as specified in the Memorandum of Agreement between the Connecticut Department of Energy & Environmental Protection and the Five Conservation Districts of Connecticut for Technical Assistance for Locally Approvable Construction General Permits. I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify, based on my review of the requirements of such general permit and on the standard of care for such projects, that the Plan is in compliance with the requirements of the general permit. I understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Registrations submitted to DEEP for which the District review was begun but ***could not be completed*** within the time limits specified in the Memorandum of Agreement shall include the following statement:

"I hereby certify that I am an employee of the [INSERT NAME OF DISTRICT] Conservation District and that I meet the qualifications to review Stormwater Pollution Control Plans as specified in the Memorandum of Agreement between the Connecticut Department of Energy & Environmental Protection and the Five Conservation Districts of Connecticut for Technical Assistance for Locally Approvable Construction General Permits. I am making this statement in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I hereby state that the review of the Stormwater Pollution Control Plan (Plan) for such registration was not completed within the time frames specified in the Memorandum of Agreement. Consequently, I cannot certify that the Plan is in compliance with the requirements of the general permit."

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Memorandum of Agreement
Between
The Connecticut Department of Energy & Environmental Protection
and
the Five Conservation Districts of Connecticut
for
Technical Assistance for Locally Exempt Stormwater Construction General Permits

WHEREAS, the Commissioner of the Department of Energy and Environmental Protection ("Department" or "DEEP ") is authorized by section 22a-6(a)(2)(3) and (4) of the Connecticut General Statutes ("CGS") to enter into this Agreement; and

WHEREAS, the five Conservation Districts of Connecticut (collectively, the "Districts"), are not-for-profit corporations duly authorized, organized and existing under the laws of the State of Connecticut and are authorized by section 22a-315 of the CGS and section 22a-315-14 of the Regulations of Connecticut State Agencies to enter into this Agreement; and

WHEREAS, section 22a-430b of the Connecticut General Statutes authorizes the Department to regulate stormwater discharges from construction activities under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities ("the Construction General Permit" or "CGP"), which has been or shall be issued on October 1, 2019. The Construction General Permit requires the implementation of erosion and sediment controls to control the discharge of sediment from construction and post-construction discharges; and

WHEREAS, the Construction General Permit requires the preparation and implementation of a Stormwater Pollution Control Plan ("Plan" or "SWPCP") to prevent erosion and the discharge of sediment to the waters of the state; and

WHEREAS, pursuant to section 22a-315 of the CGS, soil and water conservation districts and boards were established to advise the Commissioner on matters of soil and water conservation and erosion and sediment control and to assist the Commissioner in implementing programs related to soil and water conservation and erosion and sediment control; and

WHEREAS, pursuant to section 22a-315 of the CGS, the soil and water conservation districts and boards may receive funds from private sources for services provided to promote soil and water conservation and to assist the Commissioner in the implementation of related programs; and

WHEREAS, section 22a-326 of the CGS declares the policy of the state "to strengthen and extend its erosion and sediment control activities and programs and to establish and implement, through the Council on Soil and Water Conservation, soil and water conservation districts, the municipalities and the

Commissioner of Energy and Environmental Protection, a state-wide coordinated erosion and sediment control program which shall reduce the danger from storm water runoff, minimize nonpoint sediment pollution from land being developed and conserve and protect the land, water, air and other environmental resources of the state;" and

WHEREAS, the Districts have understanding and experience in reviewing erosion and sediment control plans because of their longstanding participation in the municipal approval process, as required by section 22a-329 of the CGS; and

WHEREAS, DEEP and the Districts are jointly dedicated to protecting the waters of the state by controlling the discharge of sediment and the pollution resulting from stormwater runoff.

NOW, THEREFORE, in consideration of the mutual covenants and conditions hereinafter stated, the Parties agree as follows:

Special Conditions

I. REQUIREMENTS FOR TECHNICAL ASSISTANCE BY DISTRICTS

A. SWPCP technical assistance shall be conducted by a District representative having one or more of the following minimum qualifications: (i) a bachelor's degree in hydrology, engineering (agricultural, civil, environmental, or chemical), landscape architecture, geology, soil science, environmental science, natural resources management, or a related field and two years of professional and field experience, or (ii) the EnviroCert International, Inc. designation as a Certified Professional in Erosion and Sediment Control (CPESC), Certified Erosion, Sediment and Stormwater Inspector (CESSWI), or a Certified Professional in Stormwater Quality (CPSWQ).

B. All technical assistance on SWPCPs undertaken by a District shall be conducted in accordance with the guidelines and procedures established by DEEP in consultation with the Districts, as further described below.

II. LOCALLY EXEMPT PROJECTS

For locally exempt projects, as defined in the Construction General Permit, with five (5) or more acres of soil disturbance, the appropriate District (as specified in the CGP and as indicated in Exhibit 2 appended hereto) shall, upon request by DEEP, provide technical assistance to DEEP for ensuring implementation of the Stormwater Pollution Control Plan in compliance with the CGP.

A. SWPCP Compliance Technical Assistance

1. The District shall be responsible for inspections to ensure that the SWPCP is properly implemented in accordance with the CGP by coordinating with the permittee (or designee) and conducting on-site inspections. Technical assistance will begin upon a written request from DEEP, the receipt of two copies of the approved SWPCP, and a down payment from the permittee as per the fee schedule in Exhibit 1. Once the District is in receipt of the documents and such down payment, the permittee's SWPCP shall be considered submitted to the District and the District will begin the required review in accordance with this agreement

and the CGP.

2. Pre-construction Preparation**:** The District will review the approved SWPCP and any other relevant site plans, conduct an on-site visit, and set a date for the pre-construction meeting.

3. Pre-construction Meeting: Before the start of any construction, including any clearing of vegetation or installation of erosion and sediment controls (E&S controls), the District will meet with the permittee (or designee), contractor(s) and the qualified professional engineer who designed the project (designing qualified professional engineer) to review E&S control plans for construction and post-construction stormwater controls. Such meeting will include review of the construction schedule/phasing plan, inspection schedule, exchange of contacts, and discussion of any potential problem areas. If construction begins prior to this meeting, the District shall notify DEEP of non-compliance with the CGP.

4. Plan Implementation Inspection: The permittee (or designee) will notify the District when the E&S controls are installed and coordinate with the designing qualified professional engineer to schedule the Plan Implementation Inspection. The District will conduct the initial on-site inspection accompanied by the permittee (or designee) and the designing qualified professional engineer. If it is determined that the controls are installed properly and are in compliance with the approved SWPCP, the District will issue a notice that construction may proceed according to the SWPCP phasing plan. If the controls are not installed properly, the District will provide written notification to the permittee (or designee) of any action needed to comply with the SWPCP. The District shall re-inspect the site upon notification by the permittee (or designee) that the site is ready for re-inspection and in accordance with the Plan Implementation Inspection requirements in the CGP. Once the controls are properly installed and are in compliance with the approved SWPCP, the District will issue a notice that construction may proceed according to the SWPCP phasing plan.

5. Interim Inspections

   (a) As determined at the pre-construction meeting and according to the approved SWPCP or as otherwise directed by the Commissioner, interim inspections shall be conducted to verify compliance with the CGP and the SWPCP, including but not limited to, verification of site stabilization at the end of each construction phase and proper installation of controls prior to the beginning of the next phase of construction. Similar to the Plan Implementation Inspection, the permittee (or designee) will notify the District that an inspection is needed for either the closeout of one phase and/or the beginning of another.

   (b) Random inspections shall be conducted at least every 6 weeks if needed between scheduled inspections.

   (c) Additional inspections may be scheduled if E&S control objectives are not being met.

   (d) A written report will be generated following each inspection noting site conditions and any action required to maintain proper E&S controls during construction. The report will note whether or not the site is in compliance with the SWPCP and the CGP.

6. Post-Construction Inspection: Once construction is completed the District will conduct a post-construction site inspection with the permittee (or designee), designing qualified professional engineer and contractor to verify that all post-construction stormwater measures are installed properly in accordance with the CGP and the SWPCP. The District will conduct at least one follow-up site visit after the post-construction site inspection. Additional inspections may be needed if the site is not stable and remedial action is needed. Reports and required actions will follow the same protocol as outlined in II.A.5.(d), above.

7. Final Stabilization Inspection: A final site inspection with the District, contractor, and designing qualified professional engineer will be conducted to ensure the site has been fully stabilized and all post-construction stormwater Best Management Practices (BMPs) are in place and functioning. The final stabilization inspection shall not take place prior to the completion of one (1) full growing season (April – October) following a successful post-construction inspection. The District will notify DEEP to confirm the site has achieved final stabilization. Subsequent to such notification, the permittee shall submit a Notice of Termination in accordance with the CGP.

B. Audits

The District agrees that all records pertaining to this Agreement shall be maintained for a period of not less than five (5) years. Such records shall be made available to the DEEP and to the state auditors upon request. For the purposes of this Agreement, "Records" are all working papers and such information and materials as may have been accumulated by the District in performing the Agreement, including, but not limited to, documents, data, analysis, plans, books, computations, drawings, specifications, notes, inspection reports and records, estimates, summaries and correspondence, kept or stored in any form.

III. FEE SCHEDULE

A. A District will assess fees for the services it renders in conjunction with its SWPCP technical assistance in accordance with the Fee Schedule provided in Exhibit 1 to this agreement. Fees will be calculated on an hourly basis and paid for by the permittee. A down payment will be required prior to the start of any assistance.

B. The Fee Schedule shall be reviewed annually by the Parties. The Fee Schedule may be adjusted as warranted by mutual written agreement between the Districts and the Commissioner.

IV. RESPONSIBILITIES OF DEEP

A. DEEP is responsible for formal review of all locally exempt SWPCPs submitted as part of the CGP and will require performance assurance (in accordance with the CGP) or similar financial mechanisms of the permittee to ensure payments will be made to Districts for technical assistance work.

B. In order to institute standard SWPCP review guidelines and procedures, DEEP shall coordinate with the Districts to prepare a SWPCP checklist. The standard review guidelines and procedures established shall be consistent with the requirements of the Construction General Permit, the 2002 CT Guidelines for Soil Erosion and Sediment Control (as amended), and the 2004 Stormwater Quality Manual (as amended). The Commissioner shall have final approval of the

review guidelines and procedures.

C. DEEP shall provide initial training regarding SWPCP requirements for District staff involved in SWPCP technical assistance. The frequency of subsequent training shall be determined by the Commissioner.

D. DEEP shall retain final decision making authority regarding the determination that a construction site is in compliance or not with the SWPCP requirements of the Construction General Permit and shall oversee the permitting process for Construction General Permit coverage.

E. DEEP shall oversee any subsequent compliance and/or enforcement matters related to a permittee's adherence to the requirements of the Construction General Permit.

F. DEEP shall have the discretion to review any of the Districts' records pertaining to any aspect this Agreement.

V. POINTS OF CONTACT

The following shall be points of contact for this Agreement unless otherwise agreed to by all Parties. All notices, demands, requests, consents, approvals or other communications required or permitted to be given or which are given with respect to this Agreement (for the purpose of this section collectively called "Notices") shall be deemed to have been effected at such time as the notice is emailed, or placed in the U.S. mail, first class and postage pre-paid, return receipt requested, or placed with a recognized overnight express delivery service that provides for a return receipt. All such Notices shall be in writing and shall be addressed as follows:

DEEP
Director Water Permitting & Enforcement Division
Bureau of Material Management & Compliance Assurance
Department of Energy & Environmental Protection
79 Elm St.
Hartford, CT 06106
Phone: 860-424-3018
Fax: 860-424-4074

Conservation District Executive Director and/or Board Chairperson
Address & Phone of appropriate District:

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790
Ph: 860-626-7222
Fax: 860-626-7222
Email: ncd@conservect.org

Eastern Connecticut Conservation District
238 West Town Street
Norwich, CT 06360-2111
Ph: 860-319-8806
Email: Dan.Mullins@comcast.net

Connecticut River Coastal Conservation District, Inc.
deKoven House Community Center
27 Washington Street
Middletown, CT 06457
Ph: 860-346-3282
Email: ctrivercoastal@conservect.org

Southwest Conservation District
51 Mill Pond Road
Hamden, CT 06514
Ph: 203-859-7014
Email: csullivan@conservect.org

North Central Conservation
District 24 Hyde Avenue
Vernon, CT 06066
Ph: 860-875-3881
Email: tollandc@snet.net

General Conditions

VI. EXECUTIVE ORDERS AND ANTI-DISCRIMINATION.

Executive Orders. . This Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the Contract as if they had been fully set forth in it. The Contract may also be subject to Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services and to Executive Order No. 49 of Governor Dannel P. Malloy, promulgated May 22, 2015, mandating disclosure of certain gifts to public employees and contributions to certain candidates for office. If Executive Order 14 and/or Executive Order 49 are applicable, they are deemed to be incorporated into and are made a part of the Contract as if they had been fully set forth in it. At the Contractor's request, the Client Agency or DAS shall provide a copy of these orders to the Contractor.

VII. AMENDMENTS. Either the DEEP or the Districts may recommend revisions to this Agreement as circumstances may warrant; however, any revisions must be upon mutual agreement of DEEP and all five Conservation Districts. Unless otherwise stated in this Agreement, formal written amendment is required for changes to any of the terms and conditions specifically stated in the

Agreement, any prior amendments to the Agreement, and any other Agreement revisions determined material by the Department.

VIII. SEVERABILITY. The provisions of this Agreement are severable. If any part of it is found unenforceable, all other provisions shall remain fully valid and enforceable, unless the unenforceable provision is an essential element of the bargain.

IX. SOVEREIGN IMMUNITY. The Parties acknowledge and agree that nothing in the Agreement shall be construed as a modification, compromise or waiver by the State of Connecticut ("State") of any rights or defenses of any immunities provided by federal law or the laws of the State of Connecticut to the State or any of the State's, which they may have had, now have or shall have with respect to all matters arising out of the Agreement. To the extent that this section conflicts with any other section, this section shall govern.

X. FORUM AND CHOICE OF LAW. The Agreement shall be deemed to have been made in the City of Hartford, State of Connecticut. Both Parties agree that it is fair and reasonable for the validity and construction of the Agreement to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by federal law or the laws of the State of Connecticut do not bar an action against the State or the Districts, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Districts waive any objection which they may now have or shall have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

XI. TERMINATION. Notwithstanding any provisions in this Agreement, DEEP, through a duly authorized employee, may terminate the Agreement whenever the Department makes a written determination that such Termination is in the best interests of the State. The Department shall notify the Districts in writing sent by certified mail, return receipt requested, which notice shall specify the effective date of Termination and the extent to which the Districts must complete its Performance under the Agreement prior to such date; or (b) The Districts may terminate the Agreement for good cause. The Districts shall notify DEEP by written notice at least one hundred eighty (180) days prior to the effective date of termination. In order for the Districts to terminate this Agreement, (1) there must be a consensus between all five Conservation Districts that each District shall be terminating this Agreement with the DEEP; (2) such proof of consensus shall be submitted to the DEEP in the form of a letter signed by the duly authorized agent for each District by certified mail, return receipt requested, at least one hundred eighty (180) days prior to the Districts' intention to cancel or terminate. Upon the Termination of this Agreement by either Party, the Districts shall deliver to the Department copies of all Records no later than thirty (30) days after the Termination of the Agreement, or fifteen (15) days after the Non-terminating Party receives a written request from the Terminating Party for the Records. The Districts shall deliver those Records that exist in electronic, magnetic or other intangible form in a non-proprietary format, such as, but not limited to, PDF, ASCII or .TXT. Upon receipt of a written notice of Termination from the Department, the Districts shall cease operations as the Department directs in the notice, and take all actions that are necessary or appropriate, or that the Department may reasonably direct, for the protection, and preservation of records. Except for any work which the Department directs the Districts to Perform in the notice

prior to the effective date of Termination, and except as otherwise provided in the notice, the Districts shall terminate or conclude all existing subcontracts and purchase orders and shall not enter into any further subcontracts, purchase orders or commitments. Upon Termination of the Agreement, all rights and obligations shall be null and void, so that no Party shall have any further rights or obligations to any other Party, except with respect to the sections which survive Termination. All representations, warranties, agreements and rights of the Parties under the Agreement shall survive such Termination to the extent not otherwise limited in the Agreement and without each one of them having to be specifically mentioned in the Agreement. Termination of the Agreement pursuant to this section shall not be deemed to be a breach of Agreement by the Department.

XII. DURATION OF AGREEMENT. This Agreement shall be effective on January 1, 2019 or on the date of the last signature below, whichever is later, and shall continue in force unless canceled or terminated by either party in accordance with paragraph X above.

XIII. VOID AB INITIO. Notwithstanding paragraphs X and XI, the Agreement shall be void ab initio if, in the Commissioner's sole discretion, the Construction General Permit is reissued, revoked or modified to eliminate the need for the Districts to review the SWPCP pursuant to such general permit's terms and conditions or if the Construction General Permit expires and is not reissued.

XIV. INTERPRETATION. The Agreement contains numerous references to statutes and regulations. For purposes of interpretation, conflict resolution and otherwise, the content of those statutes and regulations shall govern over the content of the reference in the Agreement to those statutes and regulations.

XV. ENTIRETY OF AGREEMENT. This Agreement is the entire agreement between the Parties with respect to its subject matter, and supersedes all prior agreements, proposals, offers, counteroffers and understandings of the Parties, whether written or oral. The Agreement has been entered into after full investigation, neither Party relying upon any statement or representation by the other unless such statement or representation is specifically embodied in the Agreement.

XVI. PROTECTION OF STATE CONFIDENTIAL INFORMATION

A. The Districts or District Parties, at their own expense, have a duty to and shall protect from a Confidential Information Breach any and all Confidential Information which they come to possess or control, wherever and however stored or maintained, in a commercially reasonable manner in accordance with current industry standards.

B. Each District or District Party shall develop, implement and maintain a comprehensive data-security program for the protection of Confidential Information. The safeguards contained in such program shall be consistent with and comply with the safeguards for protection of Confidential Information, and information of a similar character, as set forth in all applicable federal and state law and written policy of the Department or State concerning the confidentiality of Confidential Information. Such data-security program shall include, but not be limited to, the following:

1. A security policy for employees related to the storage, access and transportation of data containing Confidential Information;

2. Reasonable restrictions on access to records containing Confidential Information, including access to any locked storage where such records are kept;

3. A process for reviewing policies and security measures at least annually;

4. Creating secure access controls to Confidential Information, including but not limited to passwords; and

5. Encrypting of Confidential Information that is stored on laptops, portable devices or being transmitted electronically.

C. The District and District Parties shall notify the Department and the Connecticut Office of the Attorney General as soon as practical, but no later than twenty-four (24) hours, after they become aware of or suspect that any Confidential Information which Parties have come to possess or control has been subject to a Confidential Information Breach. If a Confidential Information Breach has occurred, the District shall, within three (3) business days after the notification, present a credit monitoring and protection plan to the Commissioner of Administrative Services, the Department and the Connecticut Office of the Attorney General, for review and approval. Such credit monitoring or protection plan shall be made available by the District at its own cost and expense to all individuals affected by the Confidential Information Breach. Such credit monitoring or protection plan shall include, but is not limited to, reimbursement for the cost of placing and lifting one (1) security freeze per credit file pursuant to Connecticut General Statutes §36a-701a. Such credit monitoring or protection plans shall be approved by the State in accordance with this Section and shall cover a length of time commensurate with the circumstances of the Confidential Information Breach. The District's costs and expenses for the credit monitoring and protection plan shall not be recoverable from the Department, any State of Connecticut entity or any affected individuals.

D. The District shall incorporate the requirements of this Section in all subAgreements requiring each District Party to safeguard Confidential Information in the same manner as provided for in this Section.

E. Nothing in this Section shall supersede in any manner the District's and/ or the District Parties' obligations pursuant to HIPAA or the provisions of this Agreement concerning the obligations of the District as a Business Associate of the Department.

XVII. AMERICANS WITH DISABILITIES ACT. The Districts shall be and remain in compliance with the Americans with Disabilities Act of 1990 ("Act"), to the extent applicable, during the term of the Agreement. The DEEP may cancel the Agreement if the District and District Parties fail to comply with the Act.

XVIII. ADA PUBLICATION STATEMENT. The following statement shall be incorporated into all publications prepared under the terms of this Agreement:

"The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act (ADA). Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you: have a disability and need a communication aid or service;

have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint."

When advertising any public meetings conducted under the terms of this Agreement, the above publications language should be used as well as the following statement:

"Requests for accommodations must be made at least two weeks prior to the program date."

All videos produced under the terms of this Agreement must be made available with closed captioning.

XIX. PUBLICATION OF MATERIALS. The District must obtain written approval from the State of Connecticut prior to distribution or publication of any printed material prepared under the terms of this Agreement. Unless specifically authorized in writing by the State, on a case by case basis, the District shall have no right to use, and shall not use, the name of the State of Connecticut, its officials, agencies, or employees or the seal of the State of Connecticut or its agencies: (1) in any advertising, publicity, promotion; or (2) to express or to imply any endorsement of District's products or services; or (3) to use the name of the State of Connecticut, its officials agencies, or employees or the seal of the State of Connecticut or its agencies in any other manner (whether or not similar to uses prohibited by (1) and (2) above), except only to manufacture and deliver in accordance with this Agreement such items as are hereby contracted for by the State. In no event may the Districts use the State Seal in any way without the express written consent of the Secretary of State.

XX. CHANGES IN PRINCIPAL PROJECT STAFF. Any changes in the principal project staff must be requested in writing and approved in writing by the Commissioner at the Commissioner's sole discretion. In the event of any unapproved change in principal project staff, the Commissioner may, in the Commissioner's sole discretion, terminate this Agreement.

XXI. FURTHER ASSURANCES. The Parties shall provide such information, execute and deliver any instruments and documents and take such other actions as may be necessary or reasonably requested by the other Party which are not inconsistent with the provisions of this Agreement and which do not involve the vesting of rights or assumption of obligations other than those provided for in the Agreement, in order to give full effect to the Agreement and to carry out the intent of the Agreement.

XXII. ASSIGNMENT. The Districts shall not assign any of their rights or obligations under the Agreement, voluntarily or otherwise, in any manner without the prior written consent of the Department. The Department may void any purported assignment in violation of this section and declare the District in breach of this Agreement. Any termination by the Department for a breach is without prejudice to the Agency's or the State's rights or possible Claims.

XXIII. EXHIBITS. All exhibits referred to in, and attached to, this Agreement are incorporated in this Agreement by such reference and shall be deemed to be a part of it as if they had been fully set forth in it.

XXIV. FORCE MAJEUR. Events that materially affect the cost of the Goods or Services or the time schedule within which to Perform and are outside the control of the party asserting that such an event has occurred, including, but not limited to, labor troubles unrelated to District(s), failure of or inadequate permanent power, unavoidable casualties, fire not caused by a District, extraordinary

weather conditions, disasters, riots, acts of God, insurrection or war.

XXV. INDEMNIFICATION. The Districts shall indemnify, defend and hold harmless the State and its officers, representatives, agents, servants, employees, successors and assigns from and against any and all (1) Claims arising, directly or indirectly, in connection with the Agreement, including the acts of commission or omission (collectively, the "Acts") of the District or District Parties; and (2) liabilities, damages, losses, costs and expenses, including but not limited to, attorneys' and other professionals' fees, arising, directly or indirectly, in connection with Claims, Acts or the Agreement. The Districts obligations under this section to indemnify, defend and hold harmless against Claims includes Claims concerning confidentiality of any part of or all of the Districts' Records, any intellectual property rights, other proprietary rights of any person or entity, copyrighted or uncopyrighted compositions, secret processes, patented or unpatented inventions, articles or appliances furnished or used in the Performance. The Districts shall not be responsible for indemnifying or holding the State harmless from any liability arising due to the gross negligence of the State or any other person or entity acting under the direct control or supervision of the State. The Districts shall reimburse the State for any and all damages to the real or personal property of the State caused by the Acts of the Districts or any District Parties. The State shall give the Districts reasonable notice of any such Claims. The Districts shall carry and maintain at all times during the term of the Agreement, and during the time that any provisions survive the term of the Agreement, sufficient general liability insurance to satisfy its obligations under this Agreement. The Districts shall name the State as an additional insured on the policy and shall provide a copy of the policy to the Department prior to the effective date of the Agreement. The Districts shall not begin Performance until the delivery of the policy to the Department. The Department shall be entitled to recover under the insurance policy even if a body of competent jurisdiction determines that the Department or the State is contributorily negligent. This section shall survive the Termination of the Agreement and shall not be limited by reason of any insurance coverage.

XXVI. DISTRICT PARTIES. A District's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the District is in privity of oral or written contract and the District intends for such other person or entity to Perform under the Agreement in any capacity

Authorizing Signatures

For DEEP: Betsey Wingfield for December 18, 2020
Katherine S. Dykes, Commissioner Date

For Northwest Conservation District:

Signature 3/13/19 Date
Chairman NCD, inc.
Title

For Eastern Connecticut Conservation District:

Signature 3/26/2019 Date
Chair, ECCD
Title

For Connecticut River Coastal Conservation District, Inc.:

Signature 3/30/19 Date
CHAIR, CRCCD
Title

For Southwest Conservation District:

Signature 3/14/19 Date
Chairman SWCD
Title

For North Central Conservation District:

Signature 3-20-2019 Date
Vice-Chair
Title

Exhibit 1

Fee Schedule effective as of January 1, 2019

The Districts will be paid $120/hour for technical assistance work performed. Interim inspections must be estimated based on phasing and complexity of site.

Down payments:
$2,500 for sites ≤ 20 acres
$4,000 for sites > 20 acres

Exhibit 2

Conservation Districts of Connecticut
Regional Delineations and Contact Information

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790
Ph: 860-626-7222
Fax: 860-626-7222
Email: ncd@conservect.org

Eastern Connecticut Conservation District
238 West Town Street
Norwich, CT 06360-2111
Ph**:** 860-319-8806
Email: Dan.Mullins@comcast.net

Connecticut River Coastal Conservation District, Inc.
deKoven House Community Center
27 Washington Street
Middletown, CT 06457
Ph: 860-346-3282
Email: ctrivercoastal@conservect.org

Southwest Conservation District
51 Mill Pond Road
Hamden, CT 06514
Ph: 203-859-7014
Email: csullivan@conservect.org

North Central Conservation District
24 Hyde Avenue
Vernon, CT 06066
Ph: 860-875-3881
Email: tollandc@snet.net

NORTHWEST	SOUTHWEST	NORTH CENTRAL	CT RIVER COASTAL	EASTERN
Barkhamsted	Ansonia	Avon	Berlin	Andover
Bethel	Beacon Falls	Bloomfield	Chester	Ashford
Bethlehem	Bethany	Bolton	Clinton	Bozrah
Bridgewater	Branford	Bristol	Colchester	Brooklyn
Brookfield	Bridgeport	Burlington	Cromwell	Canterbury
Canaan	Cheshire	Canton	Deep River	Chaplin
Colebrook	Darien	Coventry	Durham	Columbia
Cornwall	Derby	East Granby	East Haddam	Eastford
Danbury	East Haven	East Hartford	East Hampton	East Lyme
Goshen	Easton	East Windsor	Essex	Franklin
Hartland	Fairfield	Ellington	Haddam	Griswold
Harwinton	Greenwich	Enfield	Hebron	Groton
Kent	Guilford	Farmington	Killingworth	Hampton
Litchfield	Hamden	Glastonbury	Lyme	Killingly
Morris	Meriden	Granby	Madison	Lebanon
New Fairfield	Middlebury	Hartford	Marlborough	Ledyard
New Hartford	Milford	Manchester	Middlefield	Lisbon
New Milford	Monroe	Plainville	Middletown	Mansfield
Newtown	Naugatuck	Simsbury	Newington	Montville
Norfolk	New Canaan	Somers	New Britain	New
North Canaan	New Haven	South Windsor	Old Lyme	London
Plymouth	North Branford	Stafford	Old Saybrook	North
Roxbury	North Haven	Suffield	Portland	Stonington
Salisbury	Norwalk	Tolland	Rocky Hill	Norwich
Sharon	Orange	Vernon	Salem	Plainfield
Sherman	Oxford	West Hartford	Westbrook	Pomfret
Southbury	Prospect	Wethersfield		Preston
Thomaston	Redding	Willington		Putnam
Torrington	Ridgefield	Windsor		Scotland
Warren	Seymour	Windsor Locks		Sprague
Washington	Shelton			Sterling
Watertown	Southington			Stonington
Winchester	Stamford			Thompson
Woodbury	Stratford			Union
	Trumbull			Voluntown
	Wallingford			Waterford
	Waterbury			Windham
	West Haven			Woodstock
	Weston			
	Westport			
	Wilton			
	Wolcott			
	Woodbridge			

APPENDIX G

Historic Preservation Review

Chapter 184a, Section 10-387 of the Connecticut General Statutes states that DEEP shall review, in consultation with the State Historic Preservation Office (SHPO) within the Department of Economic and Community Development, its policies and practices for consistency with the preservation and study of the state's archaeological and historical sites. Pursuant to this requirement, DEEP has outlined the following process for assessing the potential for a proposed development to impact these important resources. DEEP advises a review for resources identified below to ***be initiated up to one year*** prior to registration for this permit and in conjunction with the local project approval process.

Question 1
Will the proposed project will be authorized under an Army Corps of Engineers Section 404 wetland permit?

☐ Yes – Stop here – the Section 404 permit will satisfy all requirements for Appendix G
☐ No – Please answer the following questions

Question 2
Is the project site within an area of significance?

☐ Yes ☐ No ☐ Do Not Know or Unable to Determine

This can be determined by consulting the following resources:

1. National Register of Historic Places found at the link below: https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466
2. The municipality of the proposed development site for locally designated properties (including local historic districts) and any municipal ordinance pertaining to properties over 50 years old.

Question 3
Does the area of anticipated construction or ground disturbance include soils defined by the United States Department of Agriculture as "Loam, Sandy Loam, or Loamy Sand" that also may be Fine or Gravelly with slopes less than or equal to 15% (Soil mapping information is available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)?

☐ Yes ☐ No ☐ Do Not Know or Unable to Determine

Question 4
Are there buildings or structures over 50 years in age within the project site or evidence of prior human land use (i.e., buildings foundations, wells, stone walls, or other built stone features)?

☐ Yes ☐ No ☐ Do Not Know or Unable to Determine

How to Proceed

If you answered "Yes" or "Do Not Know or Unable to Determine" to any or all of Questions 2, 3, or 4 above; please contact Catherine Labadia at SHPO for additional guidance (email: catherine.labadia@ct.gov or direct phone: 860-500-2329).

If you answered "No" to each one of Questions 2, 3, or 4 above; report in the Registration Form for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities that a self-review has been conducted and report the results provided above.

Appendix H
Wild & Scenic Rivers Guidance

Overview: Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act (WSRA) charges administration of rivers in the National Wild and Scenic Rivers System (National System) to four federal land management agencies (Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service). However, to protect and enhance river values as directed in the WSRA, it is essential to use the authorities of a number of other federal agencies in administering the water column, river bed/bank, and upland river corridor.

Congress declared a policy to protect selected rivers in the nation through the WSRA. The river-administering agencies are to protect the river's identified values, free-flowing condition, and associated water quality. Specifically, each component is to be "administered in such manner as to protect and enhance the (outstandingly remarkable) values (**ORVs**) which caused it to be included in said system. . . ."

The WSRA also directs other federal agencies to protect river values. It explicitly recognizes the Federal Energy Regulatory Commission, Environmental Protection Agency, Army Corps of Engineers and any other federal department or agency with lands on or adjacent to designated (or congressionally authorized study) rivers or that permit or assist in the construction of water resources projects.

Pertinent Sections of the Wild and Scenic Rivers Act

The full Wild and Scenic Rivers Act can be found at the website: www.rivers.gov
Pertinent Sections related to the mandate to protect river values through coordinated federal actions is found in several sections of the WSRA:

Section 1(b)	Section 7(a)	Section 10(a)
Section 12(a)	Section 12(c)	

Designated Rivers under the Wild and Scenic Rivers Act and Contact Information

The full listing of designated rivers can be found on the website www.rivers.gov
As of the date of this publication, there are two designated rivers in Connecticut, both of which are managed under the Partnership Wild and Scenic Rivers Program, through a Coordinating Committee consisting of representatives from local communities and organizations, state government and the National Park Service. More information about these rivers, their watersheds, approved management plans, the Wild and Scenic Coordinating Committees and specific contact information can be found on the websites.

1. Farmington (West Branch) River: farmingtonriver.org
2. Farmington (Lower) & Salmon Brook: lowerfarmingtonriver.org
3. Eightmile River: eightmileriver.org
4. Wood & Pawcatuck Rivers: wpwildrivers.org

APPENDIX I
Stormwater Management at
Solar Array Construction Projects

Solar development has expanded over the last several years as Connecticut and other states have invested in this important resource to further greenhouse gas emission reductions and other renewable policy objectives. However, construction of a large-scale solar array is unlike most other construction activities regulated under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("general permit") and entails challenges not encountered in traditional development projects. If not properly managed, stormwater discharged during and after the construction of solar arrays can be a significant source of pollution resulting from increased runoff, erosion, and sedimentation, which can adversely impact wetlands or other natural resources. It is vitally important to stabilize soil, minimize soil disturbance and soil compaction, and manage the total runoff volume and velocity. Proper stormwater management practices can significantly mitigate the loss of topsoil, erosion and sediment discharges from disturbed areas and stormwater outlets, and erosion along downstream channels and streambanks. The opportunities to properly manage runoff decrease as site imperviousness increases.

Therefore, in addition to the terms and conditions of the general permit, registrations for construction of a Solar Array (as that term is defined in Section 2 of the general permit) shall, at a minimum, adhere to the conditions listed below. Depending on site-specific conditions for a particular solar array construction project, additional analyses may be required.

(I) Design and construction requirements

(1) Roadways, gravel surfaces and transformer pads within the solar array are considered effective impervious cover for the purposes of calculating Water Quality Volume (WQV). In addition to these impervious surfaces, all solar panels in the array shall also be considered effective impervious cover for the purposes of calculating Water Quality Volume if the proposed post-construction slopes at a site are equal to or greater than 15% or if the post-construction slopes at a site are less than 15% and the conditions in (a) – (d), inclusive, below have not been met:

(a) The vegetated area receiving runoff between rows of solar panels (see Figures 1 and 2, below) is equal to or greater than the average width of the row of solar panels draining to the vegetated area;

(b) Overall site conditions and solar panel configuration within the array are designed and constructed such that stormwater runoff remains as sheet flow across the entire site and flows towards the intended stormwater management controls;

(c) The following conditions are satisfied regarding the design of the post-construction slope of the site:

(i) For slopes less than or equal to 5%, appropriate vegetation shall be established that will ensure sheet flow conditions and that will provide sufficient ground cover throughout the site; and

(ii) For slopes greater than 5%, but less than 10%, practices including, but not limited to, level spreaders, terraces or berms as described in Figure 2, below, shall be used to ensure long term sheet flow conditions; and

(iii) For slopes greater than or equal to 8%, erosion control blankets or stump grindings or erosion control mix mulch or hydroseed with tackifier shall be applied within 72 hours of final grading, or when a rainfall of 0.5 inches or greater is predicted within 24 hours of final grading, whichever time period is less; and

(iv) For slopes equal to or greater than 10% and less than 15%, the Plan includes specific engineered stormwater control measures with detailed specifications that are designed to provide permanent stabilization and non-erosive conveyance of runoff to the property line of the site or downgradient from the site.

(d) The solar panels shall be designed and constructed in such a manner as to allow the growth of native

vegetation beneath and between the panels. Pollinator-friendly vegetation is strongly encouraged. With respect to such vegetation, the Permittee shall not use chemical fertilization, herbicides, or pesticides except as necessary to establish such vegetation.

(2) (a) Prior to commencing construction activities, the Permittee shall ensure that the following setback and buffer shall be delineated and maintained on the site:

(i) No solar panel associated with a solar array shall be located within one-hundred (100) feet of any wetland or waters ("the 100-foot setback") that, prior to or after construction, is located downgradient of such construction activity or within fifty (50) feet of any property boundary ("the 50-foot setback") that, prior to or after construction, is located downgradient of such construction activity; and

(ii) Except as provided in section 2(a)(iii), there shall be an undisturbed buffer of at least fifty (50) feet between any construction activity at a site and any wetland or waters that, prior to or after construction, is located downgradient of such construction activity ("the 50-foot buffer"). Such buffer shall be comprised of existing dense herbaceous vegetative ground cover (e.g. not forested area). If the entirety of such buffer is not comprised of existing dense herbaceous vegetative ground cover, such buffer shall be at least one-hundred (100) feet ("the 100-foot buffer").

(iii) There shall be an undisturbed buffer of at least ten (10) feet between any construction activity at a site associated with an access road or the electrical interconnection necessary for the solar array and any wetland or waters that, prior to or after construction, is located downgradient of such construction activity ("10-foot buffer"), except if the access road or electrical interconnection passes between two wetland or waters and the undisturbed buffer cannot be achieved. Any crossing through a wetland or waters for an access road or electrical interconnection is exempt from such buffer requirement.

(b) Notwithstanding section 2(a)(ii), the 50-foot buffer or 100-foot buffer, as applicable, may be reduced, only where necessary, but by no more than fifty percent (50%), only if all of the following have been demonstrated to the satisfaction of the commissioner by approval of a Registration:

(i) Stormwater control measures for managing stormwater discharges that will enter or be received by a wetland or waters shall be designed and installed in accordance with the following conditions:

(A) a minimum sediment load reduction of ninety percent (90%) shall be achieved before such discharges enter or are received by a wetland or waters. The required sediment load reduction shall be calculated based solely on the stormwater controls used; no sediment load reduction from conditions on the site (i.e., from any remaining buffer) shall be considered when calculating the sediment load reduction from such stormwater controls. The sediment load reduction may be calculated using a range of available models that are available to facilitate this calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other equivalent independent third party model or method acceptable to the commissioner;

(B) those portions of a solar array from which stormwater discharges enter or will be received by a wetland or waters shall be deemed effective impervious cover for the purposes of calculating Stream Channel Protection in accordance with Section 7.6.1 of the Stormwater Quality Manual, even if those portions of such array are less than one (1) acre; and

(C) the buffer into which stormwater discharges shall have a slope of less than or equal to fifteen percent (15%)

(c) A soil scientist, as that term is defined in Section 2 of the general permit, shall delineate all wetland or waters by field survey. The location of all wetland or waters and all required setbacks and buffers shall be shown on all mapping and prior to the start of construction be clearly marked on the site with flags, stakes, tape, or a similar marking device by a surveyor licensed in Connecticut.

(d) Delineation of the 100-foot setback and any buffer required under this section shall be measured perpendicularly and laterally from the nearest part of the solar array or construction activity, as applicable, to:

(i) in the case of waters, the ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris;

(ii) the nearest edge of the stream or river bank, bluff, or cliff, as applicable; and

(iii) the nearest edge of any wetland, as determined by a soil scientist.

(e) The Plan shall indicate how compliance with this section will be achieved.

(f) Prior to the approval of a registration, the commissioner may determine that the 100 foot-setback or any buffer required under this section is not adequate to protect water quality or natural resources (i.e., a vernal pool, cold-water perennial streams, perennial headwater seeps or similar sensitive wetland or waters, or other sensitive habitat). In such a case, the commissioner may reject or disapprove the registration, or may impose additional terms and conditions in the approval of such registration, including, but not limited to, an additional setback, buffer or other control measure.

(g) Nothing in this section is intended to or shall prevent improvements, as may be directed by the commissioner in the approval of a registration, to enhance the water quality benefits or the natural resource value of any buffer required under this section.

(h) The terms "wetland", "wetlands", and "waters" shall be as defined in Section 2 of the general permit. In addition, the term "access road" shall mean a road used for the sole purpose of gaining access to the site from a public road or right-of-way or a road used solely to provide access between separate internal areas of fenced solar arrays. Access road shall *not* include any other road, including, but not limited to, a road around the perimeter of a solar array or a road used to service solar arrays.

(3) The lowest vertical clearance of the solar panels above the ground should not be greater than ten (10) feet. The panels shall, however, be at an adequate height to support vegetative growth and maintenance beneath and between the panels. If the lowest vertical clearance of the solar panels above the ground is greater than ten (10) feet, non-vegetative control measures will be required to prevent/control erosion and scour along the drip line or otherwise provide energy dissipation from water running off the panels. This section does not apply to solar carports that are installed over asphalt pavement.

(4) In addition to the pre-construction meeting required by Section 3(*b*)(15) of the general permit, prior to each phase of any construction activity, the Permittee shall ensure that a preconstruction meeting takes place with the designing qualified professional, qualified inspector, and all site contractors and subcontractors to be involved in construction, and the appropriate District personnel. Such meeting shall include a site walk of the project site. The Permittee shall ensure that a record of the date of such meeting and a report summarizing the meeting shall be prepared and retained in the Permittee's Plan, with a copy sent to all parties who attended the preconstruction meeting.

(5) (a) The Permittee shall retain the designing qualified professional and a qualified inspector (as those terms are defined in Section (2)) to conduct the Plan Implementation and Routine inspections pursuant to Section 5(*b*)(4), provided that any qualified inspector shall be chosen by the designing qualified professional. Unless otherwise approved in writing by the Commissioner, such designing qualified professional and qualified inspector shall be retained for the duration of the construction project until the Notice of Termination has been submitted to the Commissioner and determined to be acceptable, as described below in paragraph (8) below.

(b) Plan Implementation Inspections: Notwithstanding the schedule of inspections set forth in Section 5(*b*)(4) of the general permit, the Permittee shall ensure that the designing qualified professional and the qualified

inspector chosen by such designing qualified professional conduct Plan Implementation Inspections beginning with the commencement of construction activities and through each phase of construction until all perimeter controls, initial erosion and sediment control measures, and construction stormwater traps, basins, swales, and other control measures associated with each phase have been installed and stabilized. In addition, once all of these measures have been installed and stabilized, the Permittee shall ensure that the designing qualified professional certifies in writing to their completion in the applicable inspection report in accordance with the Plan. The Permittee shall ensure that the designing qualified professional conducts a Plan Implementation Inspection of the site at least once a month and the qualified inspector chosen by such designing qualified professional conducts such inspection at least once a week. (The qualified inspector does not need to conduct a weekly inspection during the week the qualified designing professional conducts a monthly inspection).

(c) Routine Inspections: Following the completion of the Plan Implementation Inspections (i.e., after the designing qualified professional has certified that stormwater control measures have been installed and stabilized) and notwithstanding the requirements of Section 5(*b*)(4)(B) of the general permit, either the designing qualified professional or the qualified inspector shall conduct weekly Routine Inspections pursuant to Section 5(*b*)(4)(B) of the general permit, provided that the designing qualified professional shall inspect the site at least once a month, or more frequently if necessary, to confirm that the site is in compliance with the general permit and determine if it is necessary to install, modify, maintain, or repair such controls and/or measures to improve the quality of stormwater discharges.

(d) In addition to any requirements of Section 5(*b*)(4)(B) of the general permit, the designing qualified professional shall seal and certify to the truth and accuracy of each inspection undertaken pursuant to this section regardless of whether the inspection is performed by such designing qualified professional or the qualified inspector. On or before five (5) days after the completion of each inspection, the Permittee shall ensure that certified inspection reports of all inspections undertaken pursuant to this section are provided by the designing qualified professional directly to the Permittee and shall ensure that a copy of the certified inspection report of each such inspection is provided to the appropriate District personnel and submitted electronically to the Department via email at DEEP.stormwaterstaff@ct.gov.

(e) Unless otherwise provided for in this section, the Permittee shall comply with section 5(*b*)(4) of the general permit, including, but not limited to, taking action if an inspection indicates that the site is not in compliance with the terms and conditions of the Plan or the general permit.

(f) The Permittee shall also ensure that the proposed inspection checklist prepared by the designing qualified professional is submitted for the review and approval of the Commissioner and is included with the registration for the general permit. No other professionals may serve as the designing qualified professional or qualified inspector without the prior submittal of relevant credentials and inspection checklist for the Commissioner's review and written approval.

(6) In addition to the requirements of this general permit regarding inspection checklists, the Permittee shall ensure that a copy of all such checklists are submitted electronically to the Department email (DEEP.stormwaterstaff@ct.gov) and the appropriate District within five (5) days from the date an inspection of the site was performed.

(7) The Permittee shall ensure, after completion of a construction project, that a Notice of Termination is filed in compliance with Section 6 of this general permit, including the requirement that such Notice of Termination be signed by a District representative certifying that such District representative has personally conducted a Post-Construction Inspection and Final Stabilization Inspection in accordance with Section 6(*a*) of this general permit and verified compliance with the requirements of that section. The Notice of Termination shall not be submitted until two (2) full growing seasons have passed following final stabilization. Monthly post-construction inspections shall be conducted by the qualified inspector following final stabilization until the Notice of Termination is submitted.

(8) (a) Prior to undertaking any construction activity, the Permittee shall secure and maintain a letter of credit in

accordance with the requirements of this section.

(b) For sites with a total disturbance of twenty (20) acres or more, the amount of the Letter of Credit shall be $15,000.00 per acre of disturbance. For sites with a total disturbance of less than twenty (20) acres, the amount of the Letter of Credit shall be $7,500.00 per acre of disturbance. Should a project developer locate more than one project with a total disturbance of less than twenty (20) acres in the same vicinity, for purposes of this section, the Commissioner reserves the right to combine such projects and consider them as being a site with a total disturbance of twenty (20) acres or more.

(c) The wording of such letter of credit must be identical to the wording specified in Appendix J of the general permit. The Permittee shall maintain such letter of credit in effect until the Commissioner notifies the permittee that the Notice of Termination, filed in compliance with Section 6 of the general permit has been accepted by the Commissioner.

(d) At the option of the Permittee, the amount of the letter of credit required under section 8(b) of Appendix I may be reduced:

(i) By forty (40) percent of the amount of the original letter of credit, only upon a determination by the Commissioner or, after designation of a District by the Commissioner, a representative from such District, that all perimeter controls, initial erosion and sediment control measures, and construction stormwater traps, basins, swales, and other control measures have been installed, functioning and stabilized in accordance with the general permit and the Plan;

(ii) By forty (40) percent of the amount of the original letter of credit, only upon a determination by the Commissioner or, after designation of a District by the Commissioner, a representative from such District, that all post-construction stormwater management measures specified in the SWPCP have been installed, functioning and stabilized in accordance with the general permit and the Plan; and

(iii) Upon the Commissioner's acceptance of the Notice of Termination filed in compliance with Section 6 of the general permit, the letter of credit may be terminated.

(e) The process for reducing the amount of the letter of credit in accordance with section 8(d) of Appendix I shall be as follows: the Permittee shall first submit a new letter of credit identical in all respects to the letter of credit in Appendix J, except for the reduced amount. Once the new letter of credit is received and the Commissioner determines that it is satisfactory, the Commissioner shall follow any reasonable instructions from the issuing bank regarding the termination or return of the previous letter of credit.

II. Design requirements for post-construction stormwater management measures.

(1) Post-construction stormwater control measures shall be designed and constructed to provide permanent stabilization and non-erosive conveyance of runoff on the site, to the property line of the site or downgradient from the site to ensure protection of on- and off-site wetland, wetlands, and waters (as those terms are defined in Section 2 of the general permit) or other natural resources.

(2) Orientation of panels shall be considered with respect to drainage pattern, flow concentration, drainage area and velocity.

(3) The permittee shall conduct a hydrologic analysis that:

(a) Evaluates and controls the 2, 25, 50 and 100-year 24-hour rainfall event post-development peak discharge to the corresponding pre-development peak discharge rates in accordance with the Stormwater Quality Manual, with the following exceptions: that sheet flow is maintained for a maximum length of 100 feet; shallow concentrated flow is calculated using velocity factors per NRCS Part 630 National Engineering Handbook Chapter 15 (the use of TR-55 paved or unpaved velocity factors are not acceptable); if swales are used to convey or control stormwater, such swales shall convey and control stormwater from a 100-year, 24-hour

rainfall event; and

(b) Is based on site specific soil mapping to confirm soil types; and

(c) Is able to determine and confirm the infiltrative capacity of any stormwater management measures . In addition, in areas where grading exceeds a two (2) foot difference between existing and proposed grades, the runoff curve number shall increase by one full HSG (e.g. runoff curve number for soils of HSG B shall be considered HSB C). For the remainder of the entire site, the runoff curve number associated with the Hydrologic Soil Group present on-site shall increase by one half (1/2) the difference between the Hydrologic Soil Group present on-site and the next higher Hydrologic Soil Group (e.g. half the difference between the runoff curve number for HSG B versus HSG C) to account for the compaction of soils that results from extensive machinery traffic over the course of the construction of the array; and

(d) Is based on slope gradient, surveyed soil type (adjusted per subparagraph (c), above), infiltration rate, length of slope, occurrence of bedrock, and change in drainage patterns. Pre- and post-development drainage area maps shall be provided showing this information; and

(e) For an engineered stormwater management system, demonstrates no net increase in peak flows, erosive velocities or volumes, or adverse impacts to downstream properties in accordance with the general permit and the Stormwater Quality Manual.

Figure 1
Solar Panel Installation with Slopes ≤ 5%

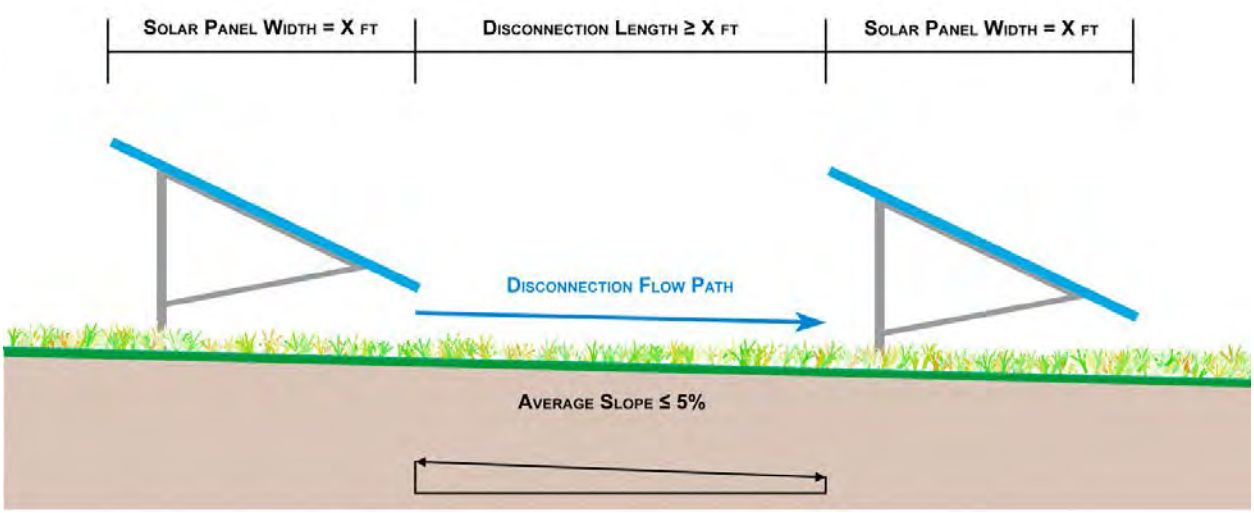
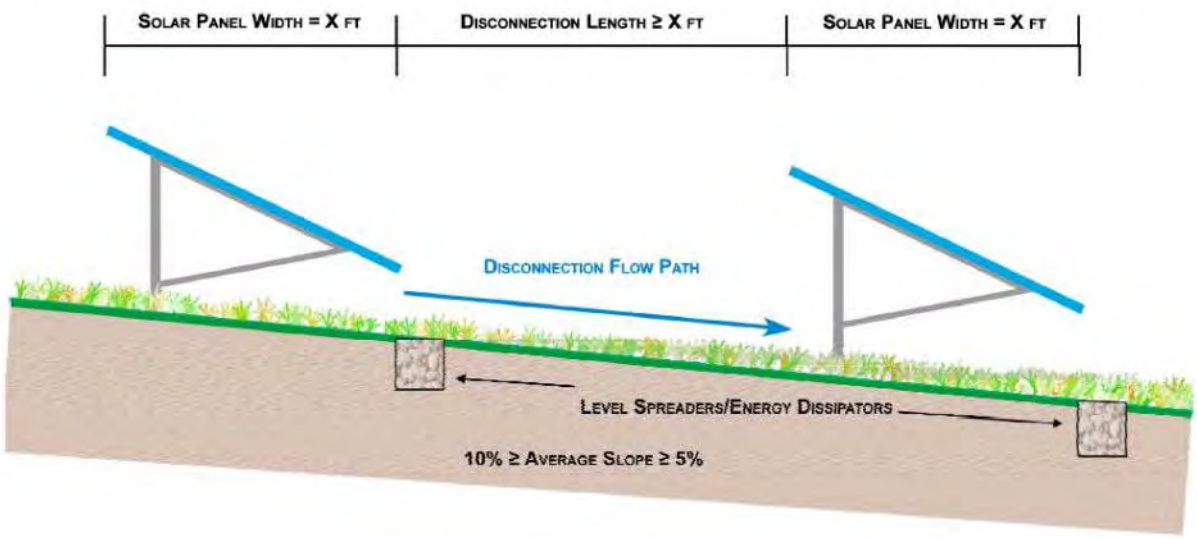


Figure 2
Solar Panel Installation with Slopes > 5% and ≤ 10%



Source: Maryland Department of the Environment: Stormwater Design Guidance – Solar Panel Installations

APPENDIX J
CTDEEP Financial Assurance Irrevocable Letter of Credit

[NAME OF ISSUING BANK]

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER: [XXXX]

ISSUANCE DATE: [MONTH, DATE, YEAR]

TOTAL AMOUNT: U.S. $[X,XXX.00]

BENEFICIARY: Commissioner, Connecticut Department of Energy and Environmental Protection

APPLICANT: [APPLICANT NAME AND ADDRESS]

Commissioner
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Dear Sir or Madam:

We hereby establish our Irrevocable Standby Letter of Credit No. [XXXX] in your favor, at the request and for the account of the Applicant, [APPLICANT NAME AND ADDRESS], up to the aggregate total amount of [XXX] U.S. Dollars ($[X,XXX].00). We hereby authorize the Commissioner of the Connecticut Department of Energy and Environmental Protection ("Commissioner") to draw at sight on us, [NAME AND ADDRESS OF ISSUING BANK], an aggregate amount up to the total amount, available upon presentation of:

(1) your sight draft, bearing reference to this Letter of Credit No. [XXXX], and

(2) your signed, dated statement reading as follows: "I certify that the amount of the draft is payable because I have determined one or more of the following has occurred or is occurring:

(a) one or more violations of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities issued by the Commissioner and which is currently in effect, or one or more violations of any other requirement or approval applicable to the management of stormwater at or emanating from [ADDRESS OF SITE] ("the Property"), or

(b) stormwater at or emanating from the Property is or has become a potential source of pollution (as that term is defined in Conn. Gen. Stat. § 22a-423) which has not been

remedied to my satisfaction within five (5) business days of the Applicant's receipt of a written notice from me that a pollution condition exists, or

(c) the Applicant, or any other entity in which the Applicant has a controlling interest, no longer owns, leases, or can control the use of the Property, or no longer owns, operates, or has a controlling interest in the solar array facility located at the Property, or

(d) the issuing bank has notified me that it has decided not to extend this letter of credit beyond the current expiration date."

This letter of credit is effective as of [MONTH, DATE, YEAR] and shall expire on [MONTH, DATE, YEAR AT LEAST ONE YEAR LATER], but such expiration date shall be automatically extended for a period of one year and on each successive expiration date, unless, at least 120 days before the current expiration date, we notify both you and Applicant, [APPLICANT NAME], by certified mail or nationally recognized courier service that we have decided not to extend this letter of credit beyond the current expiration date. In the event you are so notified, any unused portion of this letter of credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by you, as shown on the signed return receipts or evidence of courier delivery.

Multiple and partial draws on this letter of credit are expressly permitted, up to an aggregate amount not to exceed the total amount. Whenever this letter of credit is drawn on under and in compliance with the terms of this letter of credit, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft directly into a Connecticut Department of Energy and Environmental Protection dedicated account in accordance with your instructions.

All banking and other charges under this letter of credit are for the account of the Applicant.

This letter of credit is issued subject to the edition of the Uniform Customs and Practice for Documentary Credits, published and copyrighted by the International Chamber of Commerce, in effect on the date this Letter of Credit is issued.

By signing, the signatory below certifies, under penalty of law, that the issuing institution is an entity which has the authority to issue letters of credit and whose letter of credit operations are regulated and examined by a Federal or State agency.

_____

[SIGNATURE(S) OF OFFICIAL(S) OF ISSUING INSTITUTION]

_____

[TITLE(S) OF OFFICIAL(S) OF ISSUING INSTITUTION]

Date: [MONTH, DATE, YEAR]

APPENDIX B

CONTRACTOR'S CERTIFICATION STATEMENT

GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS ASSOCIATED WITH CONSTRUCTION ACTIVITIES

STORM WATER POLLUTION CONTROL PLAN
GENERAL CONTRACTOR'S CERTIFICATION

Project Site: Western Middle School Fields Greenwich, CT

GENERAL CONTRACTOR'S CERTIFICATION:

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this general permit, and must comply with the terms and conditions of this permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for this site."

Name: _____
(Print)

Signature: _____

Title: _____

Company Name: _____

Address: _____

_____

_____

Telephone Number: _____

Date: _____

Scope of Services: _____

APPENDIX C

SITE INSPECTION CHECKLIST

Western Middle School Fields
Greenwich, Connecticut
Stormwater Pollution Control Plan
Weekly Construction Site Inspection Checklist and Report for Temporary and Final Stabilized Areas

Date of Weekly Inspection: _____

Project/Construction Manager Name, Signature and Qualifications: _____

Areas/Items Inspected	Checked (Y/N)	Comments/Notes	Corrective Actions Taken (Explain)
1. All Disturbed/Unstabilized Soil Areas			
2. Soil Erosion and Sediment Control Measures (e.g., silt fences, haybales, inlet protection, etc.)			
3. Construction Entrances			
4. Material/Vehicle/Machinery/Equipment Storage Areas			
5. Catch Basins/Water Quality Units			
6. Diversion Berm/Ditch and Stone Check Dams			
7. Sediment Traps/Detention Basins			
8. Soil Stockpile Areas			
9. Stormwater Discharge Points (e.g., riprap pads)			
10. Debris			
11. Waste Receptacles			
12. Litter			
13. On-site and Nearby Wetlands and Watercourses			
14. Other Relevant Areas or Items			

APPENDIX D

CONFIRMATION OF RECEIPT OF APPLICATION

TO BE INSERTED UPON RECEIPT FROM CTDEEP

APPENDIX E

CERTIFICATE OF REGISTRATION

TO BE INSERTED UPON RECEIPT FROM CTDEEP

APPENDIX F

NOTICE OF TERMINATION FORM

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: ***GSN***
2. Fill in the name of the registrant(s) as indicated on the registration certificate:

   Registrant:
3. Site Address:

   City/Town: State: Zip Code:
4. Date all storm drainage structures were cleaned of construction sediment:

   Date of Completion of Construction:

   Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit):
5. Check the post-construction activities at the site (check all that apply):

   ☐ Industrial ☐ Residential ☐ Commercial ☐ Capped Landfill

   ☐ Other (describe):

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee	Date
Name of Permittee (print or type)	Title (if applicable)

Note: Please submit this Notice of Termination Form to:

STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

APPENDIX G

STORMWATER MANAGEMENT REPORT

17 June 2021
Revised 11 August 2022

Town of Greenwich
Department of Public Works –Engineering Division
Town Hall
101 Field Point Road
Greenwich, CT 06830

RE: Stormwater Management Analysis
Western Middle School
1 Western Junior Highway
Greenwich, Connecticut
Langan Project No.: 140148202

Dear Department of Public Works – Engineering Division:

This letter provides an analysis of the existing and proposed peak runoff discharges and the engineering design for the stormwater management system of the proposed athletic fields of 1 Wester Junior Highway in Greenwich, Connecticut.

PROJECT DESPCRIPTION

Existing Site Conditions

The proposed construction of synthetic turf athletic fields is located 1 Wester Junior Highway in Greenwich, CT; see Figure 1. The approximately 24.1-acre site is bound on the south-west by Western Junior Highway, on the north-west by residential apartment buildings, on the north-east by Greenwich Waste Disposal and on the south-east by Bimbo Bakeries.

Based upon a topographic survey prepared by Langan and dated May 12, 2021, site grades within the project limit include generally flat areas separated by steep slopes. Site grades in the north-western portion of the site area generally flat and slope down to the west from approximately 60 to 57. A 3:1 slope separates the northwestern portion of the site from the existing athletic fields to the southeast. Grades rise from approximately 60 to 78. Site grades are mostly flat within the existing athletic fields with grades ranging from an elevation of approximately 78 to 85. There is an isolated mound within the existing athletic fields, along the south-eastern border, with a high point of approximately 94. Site grades within the existing athletic fields slope down in the north-west direction to approximately 55, in the north-east direction to approximately 57, in the south-east direction to approximately 80 and in the south-west direction to approximately 71. Stormwater within our project limit drains to multiple on-site catch basins and yard drains, which discharge through an existing 36" reinforced concrete pipe (RCP) to the northwest. Additionally, stormwater drains overland to the northern and eastern borders of the site.

Based upon FEMA's Flood Insurance Rate Map (FIRM) Map 09001C0494G with an effective date of July 8, 2013 for Fairfield County, the project area is located within Zone X, or areas outside the 100-year flood plain (Figure 2).

According to the USDA Natural Resources Conservation Service Web Soil Survey, the soil types onsite include, Udorthents-smoothed, Urban land, and Urban land-charlton-chatfield complex (Figure 3).

Proposed Project

The project includes the construction of new synthetic turf athletic fields. Other proposed improvements include grading, stromwater, and landscaping.

The stormwater management system has been designed to maintain existing drainage patterns. The majority of the runoff will be collected below the synthetic turf and piped underground before connecting to the existing 18" RCP.

PEAK RUNOFF ANALYSIS (See Appendices A & B)

The stormwater management system is designed to control the rate of runoff from the site's watershed to be equal or less than existing conditions up to, and including, a 100-year design storm event.

The peak runoff discharges for the existing and proposed conditions were analyzed using Soil Conservation Service (SCS) methodology, which outlines procedures for calculating peak rates of runoff resulting from precipitation events as well as procedures for developing runoff hydrographs. The limit of disturbance for the analysis was limited to and area of approximately 9.52 acres; see Drawings EX-WS and PR-WS. Values for area, curve number (CN), and a time of concentration were calculated for the existing and proposed conditions.

The curve number is a land sensitive coefficient that represents the relationship between total rainfall depth and direct storm runoff. The soils within the watershed are divided into hydrologic soil groups (A, B, C, and D). The SCS classification system evaluates the runoff potential of a soil according to its infiltration and transmission rates. "A" soils have the lowest runoff potential, while "D" soils have the greatest runoff potential. Soils within the project area are predominantly Udorthents-smoothed, Urban land, and Urban land-charlton-chatfield complex, with a hydrologic soil group designations of "C" and "D".

The time of concentration (Tc) is defined as the time for runoff to travel from the hydraulically most distant point in the watershed to a point of interest. Values of time of concentration were determined for existing and proposed conditions based on land cover and slope of the flow path using methods outlined in TR-55.

For this study, a 24-hour SCS Type III standard rainfall distribution was used to determine the peak flow rates discharging from the site. Precipitation data used for the various storm events is based on the "24-Hour Design Storm Precipitation Amounts" from the Town of Greenwich Drainage Manual. A summary of all rainfall data utilized in the analysis for this site is provided

below and a complete compilation of data provided by the Town of Greenwich Drainage Manual is included in Appendix C.

Town of Greenwich Design Storm Rainfall Amounts [in]							
Duration	**1-Year**	**2-Year**	**5-Year**	**10-Year**	**25-Year**	**50-Year**	**100-Year**
24-hour	2.9	3.4	4.3	5.1	6.4	7.6	9.1

Existing Conditions

The existing land cover with the project limit of disturbance is primarily grass and woods with some impervious areas including bituminous walkways, driveways, and parking. The site was previously developed for grassed athletic fields. These grass areas have environmentally impacted soils that will be excavated and replaced with clean fill and topsoil. Existing Watershed 1 is about ±6.31 acres. This area consists mostly of grassy areas with some wooded and impervious cover in the south. This watershed flows overland or is collected by catch basins and eventually discharges through the existing 36" RCP pipe to the north. Existing Watershed 2 is about ±2.29 acres. This area consists mostly of grassy and wooded areas. This watershed flows overland to the north. Existing Watershed 3 is about ±1.90 acres. This area consists mostly of grassy and wooded areas with some impervious cover. This watershed flows overland to the southeast.

Proposed Conditions

In the proposed condition, site hydrology mimics the existing condition and all watershed outlets remain the same. Proposed Watershed 1 has been divided into two sub-watersheds for analysis. Watershed 1A is ±2.96 acres and collects water from the softball, soccer, lacrosse, and football fields. Watershed 1B is ±2.92 acres and collects water from the baseball field.

Stormwater from Proposed Watershed 2 will continue to flow overland to the north. Portions of the existing soils within this watershed will be excavated and replaced with clean topsoil. Stormwater from Proposed Watershed 3 will continue to flow overland to the southeast. Portions of the existing soils within this watershed will be excavated and replaced with clean topsoil.

The proposed synthetic turf athletic fields will have 18" of drainage aggregate to encourage groundwater recharge. Infiltration testing has not been completed on-site at the time of this report. Although the USDA type C soils are present in the location of the synthetic turf fields, this system was analyzed with no infiltration. The system has been modeled to include additional storage to compensate for no infiltration. Assuming a Rawl's rate of 0.27 inches per hour for Silt Loam soils (type C), the synthetic turf athletic fields drawdown time is approximately 67 hours. Hydraulic conductivity testing is scheduled for September 2022, results will be amended to this report upon completion.

Per the Town of Greenwich Drainage Manual Appendix B, the synthetic turf athletic fields infiltration BMP was sized to hold the largest of the water quality volume, runoff reduction volume, or groundwater recharge volume. The synthetic turf athletic fields for proposed

watershed 1 provides approximately 65,100 CF of storage capacity measured from the top of the emergency outlet.

Watershed Design Volumes

	PRWS-1	PRWS-2	PRWS-3	Total Site
Groundwater Recharge Volume (CF)	5,843	0	0	5,843
Runoff Reduction Volume (CF)	40,706	-5,212	-4,068	31,426
Water Quality Volume (CF)	23,503	721	909	25,132

Additional stormwater quality features that will be implemented on site include a water quality unit and catch basins with deep sumps. Details of the size and location of the stormwater network can be found on drawings CG101 and CG501.

The total off-site peak flows from the site are summarized below:

Site Discharge Comparison for WS-1

	Peak Flow (CFS)				Peak Runoff Volume (CF)			
	Current	**Proposed**	**Difference**	**Delta (%)**	**Current**	**Proposed**	**Difference**	**Delta (%)**
1-Year	6.96	5.69	**-1.27**	**-18%**	26,925	67,631	**40,706**	**151%**
2-Year	9.35	6.92	**-2.43**	**-26%**	35,673	81,884	**46,211**	**130%**
5-Year	13.88	9.23	**-4.65**	**-34%**	52,500	108,030	**55,530**	**106%**
10-Year	18.05	11.37	**-6.68**	**-37%**	68,264	131,633	**63,369**	**93%**
25-Year	24.99	14.91	**-10.08**	**-40%**	94,921	170,453	**75,532**	**80%**
50-Year	31.46	18.21	**-13.25**	**-42%**	120,277	206,621	**86,344**	**72%**
100-Year	39.57	22.34	**-17.23**	**-44%**	152,619	252,118	**99,499**	**65%**

Site Discharge Comparison for WS-2

	Peak Flow (CFS)				Peak Runoff Volume (CF)			
	Current	**Proposed**	**Difference**	**Delta (%)**	**Current**	**Proposed**	**Difference**	**Delta (%)**
1-Year	1.84	0.75	**-1.09**	**-59%**	7,883	2,671	**-5,212**	**-66%**
2-Year	2.57	1.12	**-1.45**	**-56%**	10,750	3,800	**-6,950**	**-65%**
5-Year	4.01	1.88	**-2.13**	**-53%**	16,388	6,087	**-10,301**	**-63%**
10-Year	5.36	2.61	**-2.75**	**-51%**	21,764	8,324	**-13,440**	**-62%**
25-Year	7.65	3.87	**-3.78**	**-49%**	30,987	12,242	**-18,745**	**-60%**
50-Year	9.82	5.09	**-4.73**	**-48%**	39,862	16,075	**-23,787**	**-60%**
100-Year	12.55	6.65	**-5.90**	**-47%**	51,275	21,064	**-30,211**	**-59%**

Site Discharge Comparison for WS-3

	Peak Flow (CFS)				Peak Runoff Volume (CF)			
	Current	**Proposed**	**Difference**	**Delta (%)**	**Current**	**Proposed**	**Difference**	**Delta (%)**
1-Year	1.44	0.81	**-0.63**	**-44%**	6,913	2,845	**-4,068**	**-59%**
2-Year	1.99	1.16	**-0.83**	**-42%**	9,357	3,942	**-5,415**	**-58%**
5-Year	3.06	1.85	**-1.21**	**-40%**	14,134	6,124	**-8,010**	**-57%**
10-Year	4.08	2.52	**-1.56**	**-38%**	18,669	8,225	**-10,444**	**-56%**
25-Year	5.78	3.64	**-2.14**	**-37%**	26,420	11,858	**-14,562**	**-55%**
50-Year	7.38	4.71	**-2.67**	**-36%**	33,856	15,377	**-18,479**	**-55%**
100-Year	9.40	6.08	**-3.32**	**-35%**	43,397	19,922	**-23,475**	**-54%**

The proposed stormwater management system has been designed to incorporate stormwater quality measures to promote groundwater recharge, increase water quality and minimize passage of pollutant to the downstream receiving waters as compared to the current conditions. The stormwater management system has also been designed to help provide peak runoff rate attenuations.

STORMWATER CONVEYANCE SYSTEM (See Appendix D)

The stormwater conveyance system was sized using the Rational Method for the 10-year storm event. Values for area, runoff coefficient, C, and a time of concentration were calculated for each drainage area, see Figure DACB. The average runoff coefficient was calculated based upon the following cover types:

Cover	C
Grass/Pervious	0.3
Roof/Pavement/Impervious	0.9

Rainfall intensities were taken from the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT" for Greenwich, Connecticut (41.0112°, -73.6483°). Stormwater pipes were then sized based upon the Manning's Equation for full flow pipe capacity and solving for the hydraulic grade line. The computer program Hydraflow Storm Sewers 2011 by Intellisolve was used in the analysis.

Each proposed storm sewer system has been analyzed using a starting HGL elevation equal to the outlet pipe's crown elevation. This mimics a tailwater elevation equal to the outlet pipe's diameter or a scenario where a proposed pipe is entering an existing pipe flowing at full capacity.

This Langan report confirms that the proposed stormwater system, as designed, will effectively manage quality and quantity of stormwater runoff for the proposed development. Please refer to the Drawings for additional drainage information.

STORMWATER MANAGEMENT STANDARDS

The site design and proposed stormwater management system has implemented LID techniques and BMPs, where possible, as referenced in the Town of Greenwich Drainage Manual and the CTDEEP Stormwater Quality Manual.

Standard 1: Low Impact Development

Due to the existence of environmentally impacted soils within the project area, the extents of the site disturbance is dictated by the Remedial Action Plan (RAP). Therefore, to the extent possible, existing site slopes and conditions will be maintained. For example, the steep slopes adjacent to the athletic fields will be disturbed solely for remediation purposes. Site topography, layout, and the environmental disturbance significantly impacted design considerations. To the greatest extent possible, site disturbances, steep slope disturbances, and additional impervious surfaces were minimized.

The proposed LID BMPs include an underground infiltration basin (stormwater disconnection), avoiding disturbance of steep slopes, and compost amended soils.

Standard 2: Protection of Natural Hydrology

A. Per the RAP, the site disturbance is dictated by the limit of soil excavation. This limit is outlined on sheet CE101.

B. The synthetic turf limits will be delineated after the excavation of environmentally impacted soils is complete. To the greatest extent practicable, no soil compaction or heavy machinery/ materials storage will be placed within the synthetic turf limits. See notes on sheet CS002.

C. Pre-development drainage patterns and time of concentrations are maintained where possible. The existing watersheds have been split into smaller areas which has resulted in shorter flow paths and lower time of concentrations. Where possible, no slopes have been increased.

D. Proposed site grades mimic existing topography.

E. A minimum 24" thick clean soil cap engineered control will replace all excavated soils. Above the engineered control will be an approximately 6" layer of topsoil. Compost-amended soils will be used where new grasses are proposed.

F. All disturbed and excavated soils will be replaced with clean soil, top soil, and/or reseeded.

G. No surface waters exist within the project limits.

H. No roadway or driveway crossings of surface waters exist within the project limits.

I. No roadway or driveway crossings over streams exist within the project limits.

Standard 3: Stormwater Best Management Practices

A. The selection of stormwater BMPs was based upon the limitations of the site topographic and hydrologic conditions. The synthetic turf athletic fields provided the opportunity to use the stone base as storage for an underground infiltration basin.

B. The synthetic turf athletic fields provide storage capacity and outlet control structures to attenuate the peak flow and manage the peak runoff volume for the 2, 5, 10, 25, 50 and 100-year, 24-hour design storms (see site discharge comparison tables above). See Appendix B – Proposed Stormwater Discharge Calculations for more detail.

C. N/A

D. N/A

E. N/A

Standard 4: Runoff Volume Reduction and Groundwater Recharge

A. Per discussions with the Town of Greenwich Engineering, the HydroCAD model does not incorporate infiltration. Additional storage capacity is provided in the synthetic turf fields to compensate for this, however, no runoff volume is discarded through infiltration as a result. Although peak flow is reduced, this approach results in an increase in runoff volume.

This report will be updated when infiltration testing has been completed.

B. Per Section 5.6.1 of the Drainage Manual, because the runoff reduction volume requirement is met utilizing infiltration, the groundwater recharge requirement is satisfied.

C. N/A

Standard 5: Peak Flow Control

A. The peak flow rate for the 2-year, 24-hour design storm has been reduced to less than the pre-development peak flow rate of the 1-year, 24-hour design storm.

B. Pipe conveyance calculations can be found in Appendix D.

C. Post-development peak flow rates have been controlled for the 1, 2, 5, 10, 25, 50, and 100-year 24-hour storms all watersheds (see Site Discharge Comparison tables above).

D. N/A

Standard 6: Pollutant Reduction

A. The stormwater management system includes the use of an underground infiltration basin, and deep sump catch basins. Per the Town of Greenwich Drainage Manual, the infiltration basin TSS removal efficiency is 90%.

Standard 7: High Load Areas

A. Site does not qualify as a high load area.

B. N/A

C. N/A

Standard 8: Critical Areas

A. Site stormwater discharge does not contribute to any critical areas.

B. N/A

Standard 9: Redevelopment

A. The proposed synthetic turf athletic fields is a redevelopment and environmental remediation project for the athletic fields at Greenwich Western Middle School.

B. The redevelopment of the Greenwich Western Middle School athletic fields includes soil remediation, construction of synthetic turf athletic fields and associated site, grading and landscaping improvements.

C. All undeveloped portions of the site that will be developed meet all other Town of Greenwich Stormwater Management Standards.

D. There are no known stormwater concerns under existing conditions. As discussed for Standards 4 and 5, the stormwater runoff volume and peak flow rate under proposed conditions are controlled. All proposed impervious surfaces are directed to stormwater BMPs that achieve a minimum of 80% TSS removal.

E. Through the environmental testing of the site, groundwater has been sampled numerous times and contaminants have not been identified in concentrations exceeding CT criteria. Given that the site has been open to infiltration since the fill placement in the early-1960s, the results suggest that contaminants present in the fill material have never, or are no longer, leaching into the groundwater at concentrations that would warrant remedial action.

Standard 10: Construction Erosion and Sediment Control

A. See the soil erosion and sediment control plan (sheet CE101) attached.

B. Soil erosion and sediment control devices including inlet protection, silt fencing, hay bales and slope stabilization will be installed prior to the start of construction.

Standard 11: Construction Inspections

A. A bond, cash or other acceptable surety will be posted if required by the Town of Greenwich.

B. The Town of Greenwich will be notified of the start of construction and the start of stormwater management related construction activities.

C. Inspections of the stromwater management system will be conducted by the approved engineer of record. The Town of Greenwich is entitled to conduct inspections at any time.

D. Inspections shall include an initial site inspection, site erosion control inspection, stormwater management system inspection and final site inspection. The stormwater management system shall also be observed during a storm event.

E. If the approved stormwater management system operation is inadequate, the system shall be corrected prior to final approval.

F. Upon the completion of construction, and inspection shall be conducted to certify compliance with the approved plans and specification.

Standard 12: Operation and Maintenance

A. See the attached Operation & Maintenance Manual (Appendix G).

B. Noted.

C. The school facilities department is responsible for the operation and maintenance of the stormwater management system. Any modifications made to the stormwater management system will be documented and submitted to the Town of Greenwich for review and approval.

D. The school facilities department will keep records of the installation, maintenance and repairs to the stormwater management system.

E. The school facilities department will provide records of the installation, maintenance and repairs to the stormwater management system to the Town of Greenwich as required.

F. Noted.

Standard 13: Stormwater Management Report

This report documents all activities subject to the Town of Greenwich Stormwater Management Standards. The above section describes how the proposed development satisfies the requirements of the Stormwater Management Standards.

Standard 14: Illicit Discharges

No known illicit discharges to the stormwater management system exist.

Sincerely,

Langan CT, Inc.

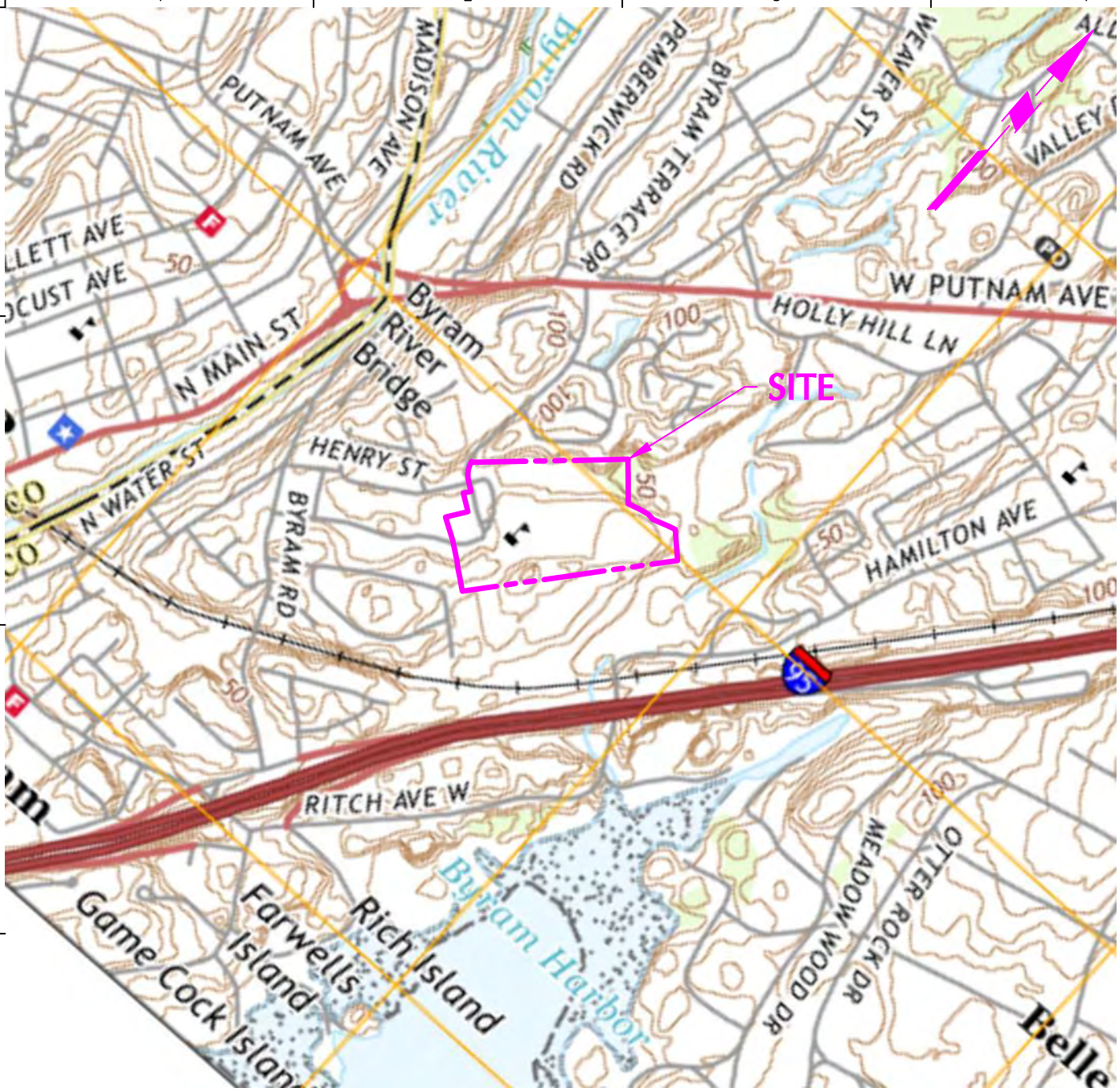
Brian Phillips, P.E.
Project Engineer

LIST OF FIGURES

LIST OF DRAWINGS

REFERENCE DRAWINGS

LIST OF APPENDICES



REFERENCE: USGS 7.5-MINUTE MAP FOR GLENVILLE, CONNECTICUT, U.S. GEOLOGICAL SURVEY, DATED 2021.

1000 0 500 1000

SCALE: 1 INCH = 1000 FEET

LANGAN

Langan CT, Inc.
555 Long Wharf Drive
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

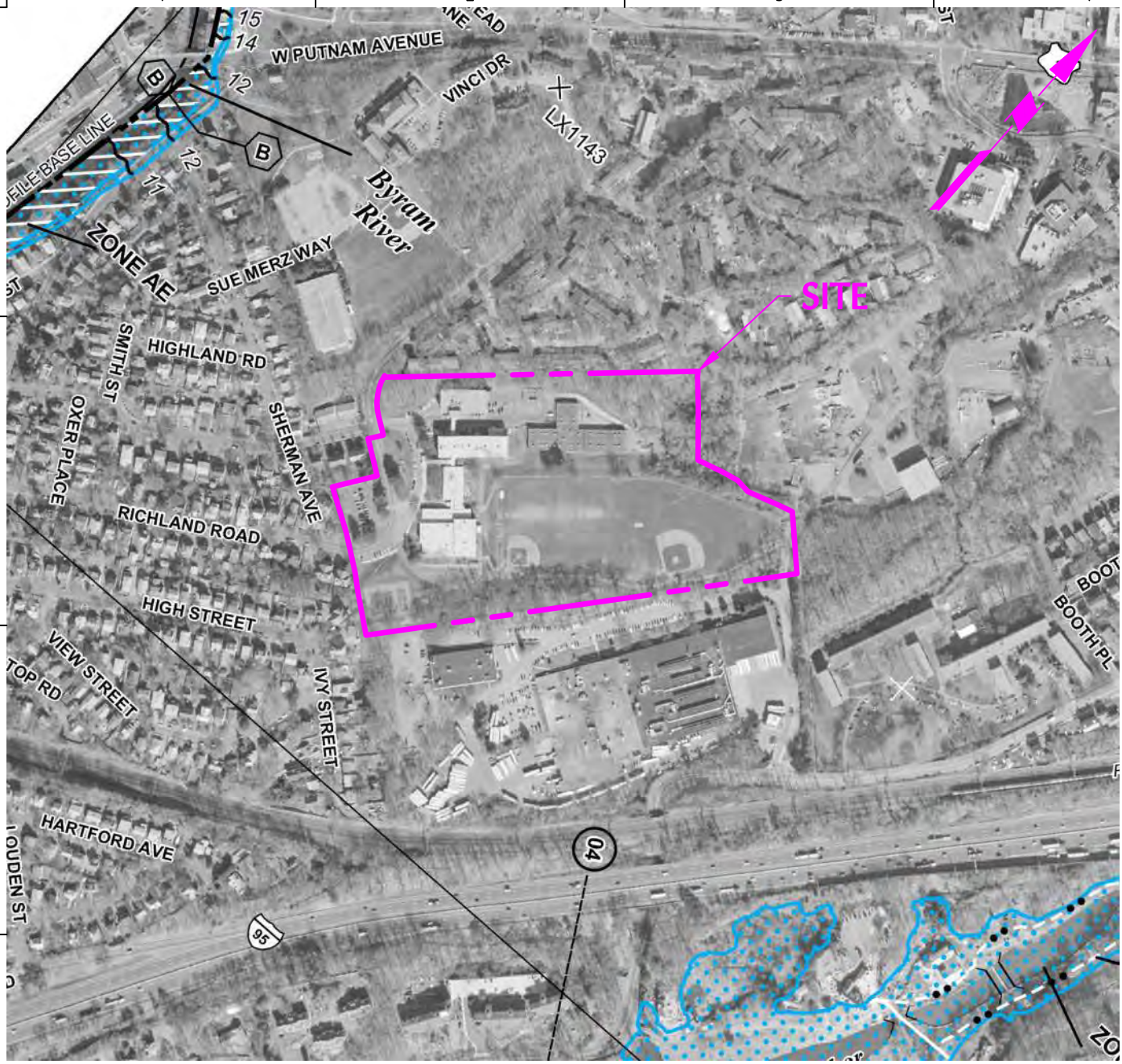
Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
USGS LOCATION MAP

Project No. 140148202
Date 12/8/2021
Drawn By BTW
Checked By BP

Drawing No.
FIG. 1
Sheet 1 of 3

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Figures\FIG.1.dwg Date: 3/17/2022 Time: 10:06 User: bwillsey Style Table: Langan.stb Layout: FIG.1



LEGEND	ZONE	DESCRIPTION
	AE FLOODWAY	THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASE IN FLOOD HEIGHTS.
	AE	BASE FLOOD ELEVATIONS DETERMINED
	VE	COASTAL FLOOD ZONE WITH VELOCITY HAZARD (WAVE ACTION); BASED ON FLOOD ELEVATIONS DETERMINED.
	X UNSHADED	AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

500 0 250 500

SCALE: 1 INCH = 500 FEET

REFERENCE: "FLOOD INSURANCE RATE MAP" FAIRFIELD, CONNECTICUT, MAP NUMBER 09001C0494G, EFFECTIVE DATE 07/08/2013.

LANGAN

Langan CT, Inc.
555 Long Wharf Drive
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

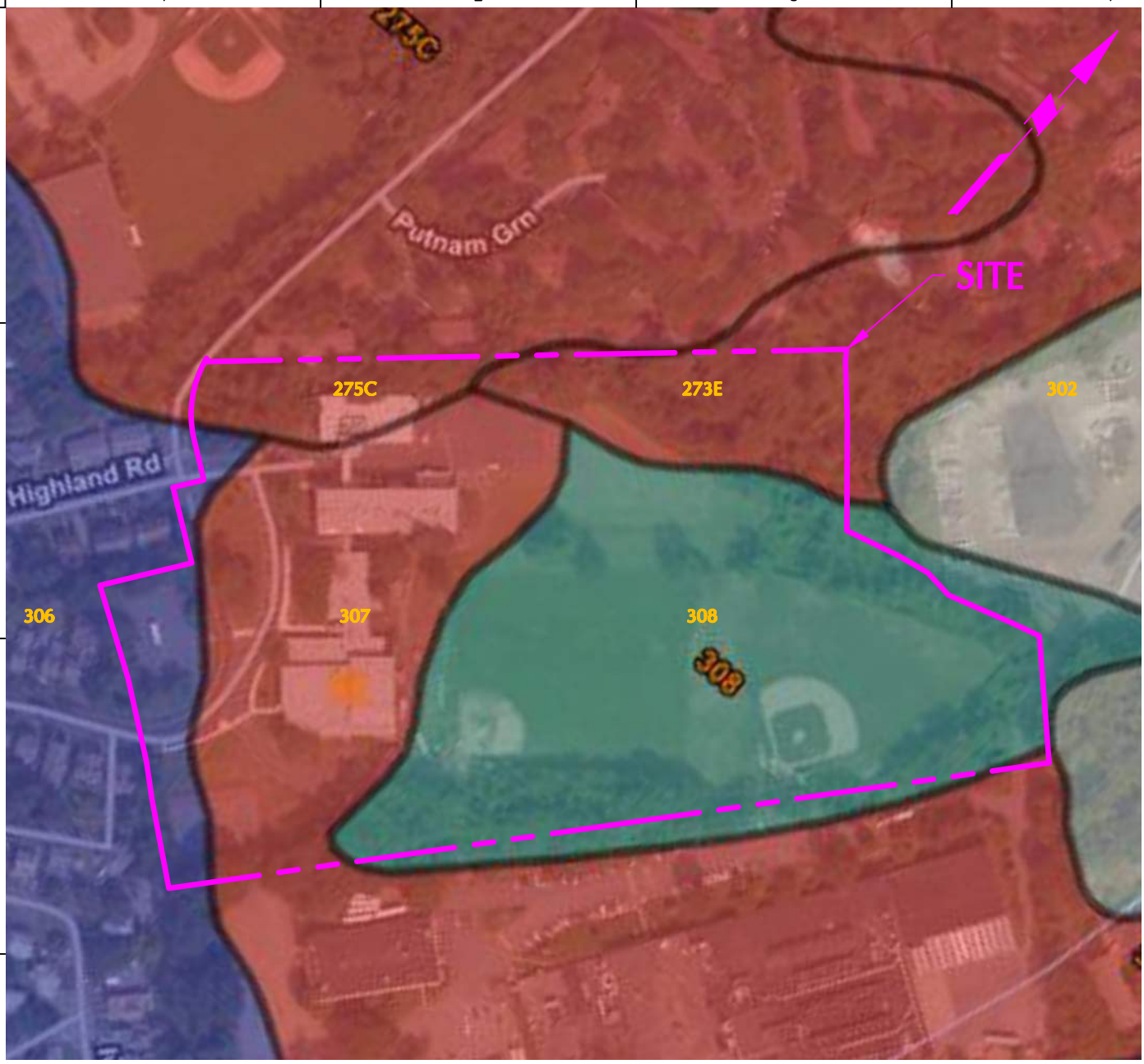
Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
FEMA FLOOD MAP

Project No. 140148202
Date 12/8/2021
Drawn By BTW
Checked By BP

Drawing No.
FIG. 2
Sheet 2 of 3

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Figures\FIG.2.dwg Date: 3/17/2022 Time: 10:06 User: bwillsey Style Table: Langan.stb Layout: FIG.2



SOIL TYPE LEGEND

ID	NAME	RATING
273E	URBAN LAND–CHARLTON–CHATFIELD COMPLEX, ROCKY, 15 TO 45 PERCENT SLOPES	D
275C	URBAN LAND–CHATFIELD COMPLEX, ROCKY, 3 TO 15 PERCENT SLOPES	D
302	DUMPS	
306	UDORTHENTS–URBAN LAND COMPLEX	B
307	URBAN LAND	D
308	UDORTHENTS, SMOOTHED	C

REFERENCE: WEB SOIL SURVEY BY THE UNITED STATES DEPARTMENT OF AGRICULTURAL AND NATURAL RESOURCES CONSERVATION SERVICE.

250 0 125 250

SCALE: 1 INCH = 250 FEET

LANGAN
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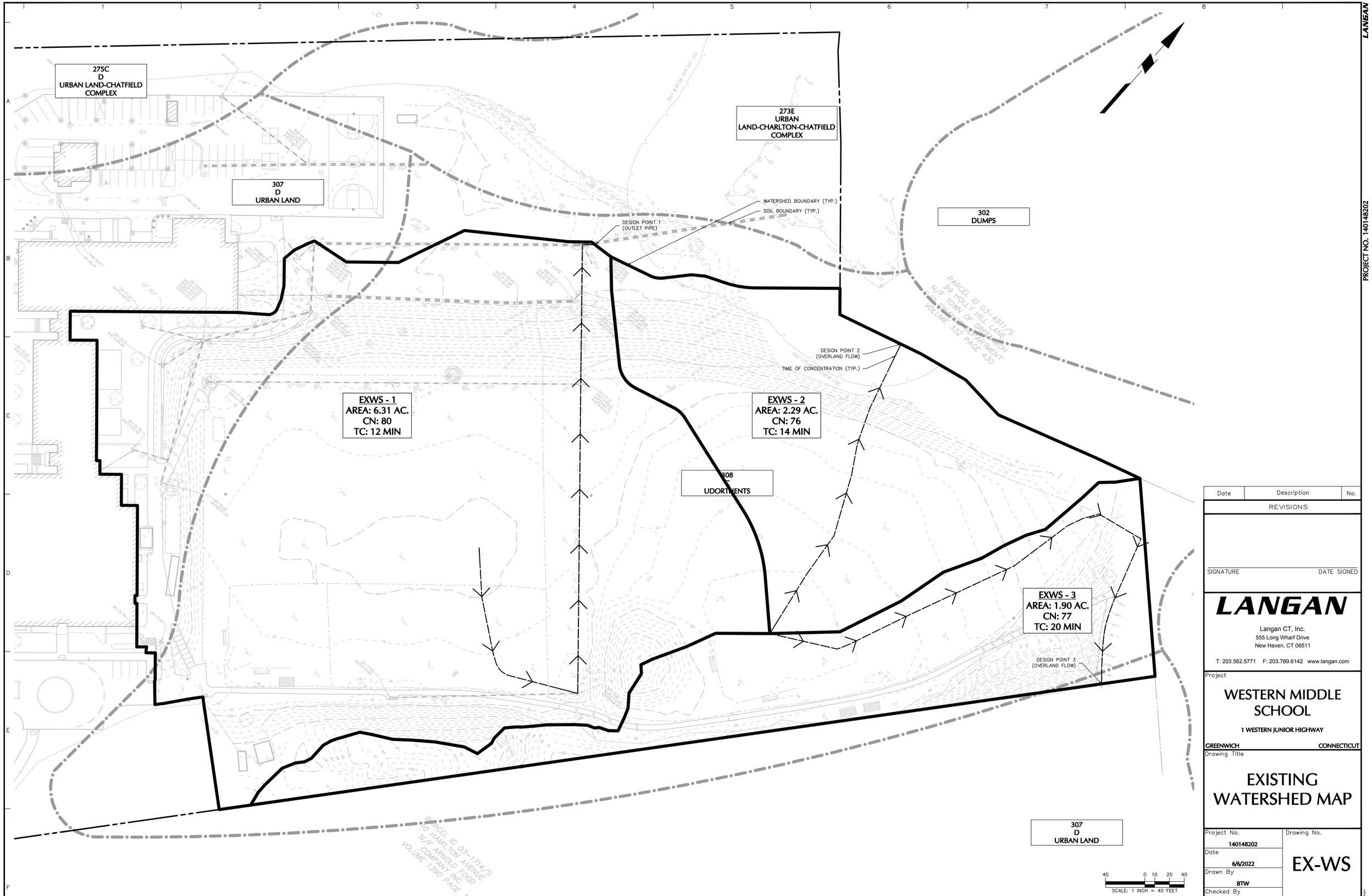
Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
NRCS SOIL MAP

Project No. 140148202
Date 12/8/2021
Drawn By BTW
Checked By BP

Drawing No.
FIG. 3
Sheet 3 of 3

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Figures\140148202-CS101-0105.dwg Date: 3/17/2022 Time: 10:06 User: bwillsey Style Table: Langan.stb Layout: FIG.3



Date	Description	No.
REVISIONS		

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New Haven, CT 06511

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

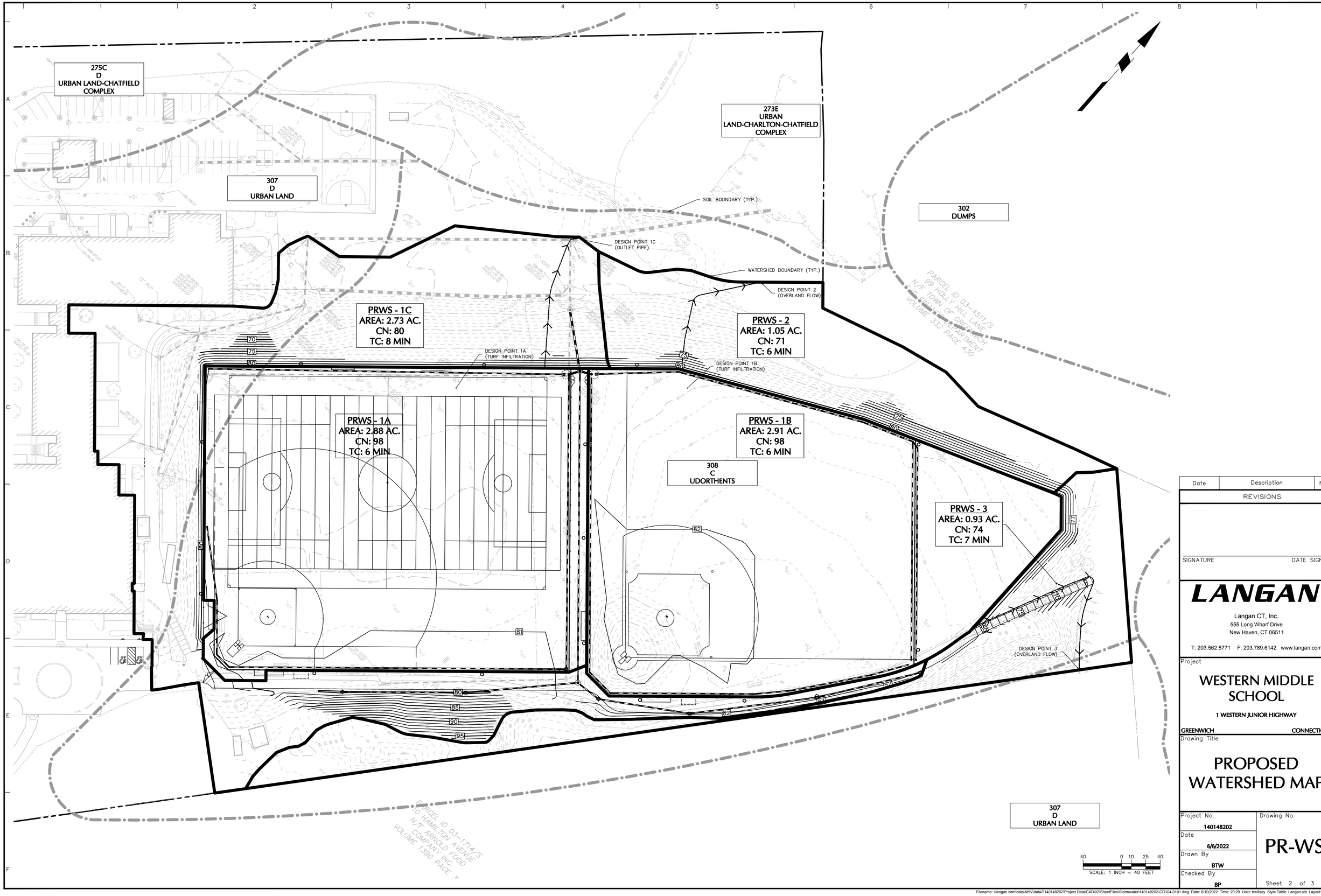
Drawing Title

EXISTING WATERSHED MAP

Project No.	Drawing No.
140148202	EX-WS
Date: 6/6/2022	
Drawn By: BTW	
Checked By: BP	Sheet 1 of 3

PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Stormwater\140148202-CG103-0101.dwg Date: 8/10/2022 Time: 20:28 User: bwillsey Style Table: Langan.stb Layout: EXWS



Date	Description	No.
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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

Drawing Title

PROPOSED WATERSHED MAP

Project No.	Drawing No.
140148202	PR-WS
Date: 6/6/2022	
Drawn By: BTW	
Checked By: BP	Sheet 2 of 3

PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Stormwater\140148202-CG104-0101.dwg Date: 8/10/2022 Time: 20:29 User: bwillsey Style Table: Langan.stb Layout: PRWS

GENERAL NOTES

1. BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY LANGAN DATED 5/12/2021.
2. THE SITE IS LOCATED IN ZONE X (UNSHADED), AN AREA OUTSIDE OF MINIMAL FLOODING PER FIRM MAP 09001C0494G, EFFECTIVE DATE JULE 8, 2013.
3. ACCORDING TO THE TOWN OF GREENWICH GIS,THE SITE DOES NOT CONTAIN ANY REGULATED WETLANDS OR WATERCOURSES.

PARCEL ID 03-4511/S
99 HOLLY HILL LANE
N/F TOWN OF GREENWICH
C/O FINANCE DEPARTMENT
VOLUME 332 PAGE 430

PARCEL ID 03-1714/S
10 HAMILTON AVENUE
N/F ARNOLD FOOD
COMPANY INC.
VOLUME 1390 PAGE 3

100' WETLAND REVIEW LINE

DRAINAGE AREA BOUNDARY LINE (TYP.)

YD-107
AREA: 0.14 AC.
C: 0.60

YD-106
AREA: 0.25 AC.
C: 0.49

YD-102
AREA: 0.03 AC.
C: 0.60

YD-103
AREA: 0.05 AC.
C: 0.76

YD-104
AREA: 0.05 AC.
C: 0.60

YD-105
AREA: 0.02 AC.
C: 0.71

SCALE: 1 INCH = 40 FEET

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH CONNECTICUT

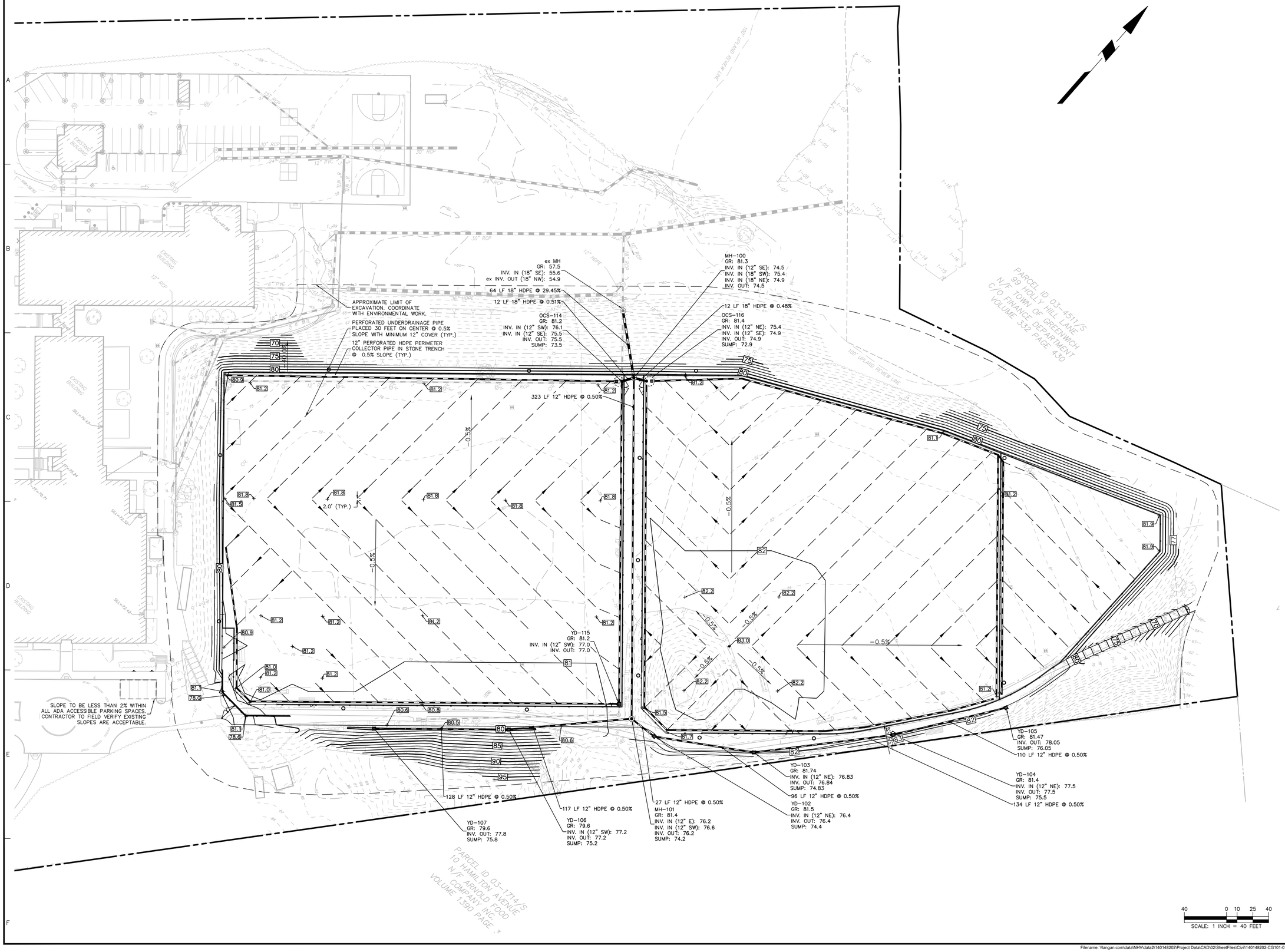
Drawing Title

DRAINAGE AREA CATCH BASIN MAP

Project No.	Drawing No.
140148202	DACB
Date: 8/11/2022	
Drawn By: BTW	
Checked By: BP	Sheet 3 of 3

PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Stormwater\140148202-CG104-0102 - DACB.dwg Date: 8/10/2022 Time: 20:29 User: bwillsey Style Table: Langan.stb Layout: DA-CB



Date	Description	No.
8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1

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WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

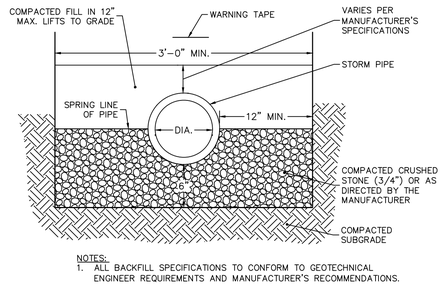
GREENWICH CONNECTICUT

Drawing Title

GRADING & DRAINAGE PLAN

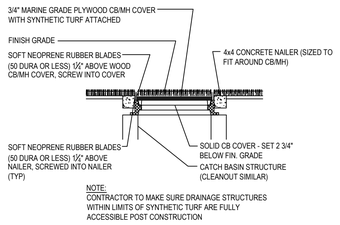
Project No.	Drawing No.
140148202	CG101
Date: 8/11/2022	
Drawn By: BTW	
Checked By: BP	Sheet 6 of 9

PROJECT NO. 140148202



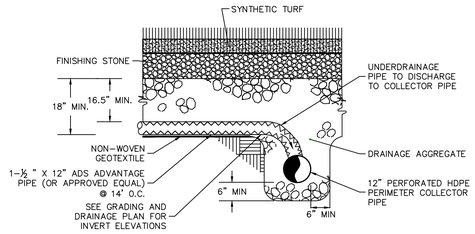
NOTES:
1. ALL BACKFILL SPECIFICATIONS TO CONFORM TO GEOTECHNICAL ENGINEER REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.

1 STORM PIPE BEDDING
N.T.S

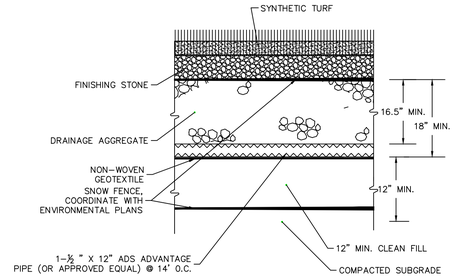


NOTE:
CONTRACTOR TO MAKE SURE DRAINAGE STRUCTURES WITHIN LIMITS OF SYNTHETIC TURF ARE FULLY ACCESSIBLE POST CONSTRUCTION

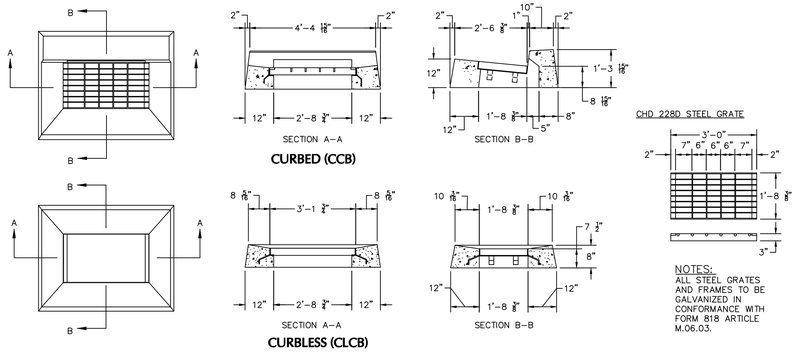
2 MANHOLE COVER AT SYNTHETIC TURF
N.T.S



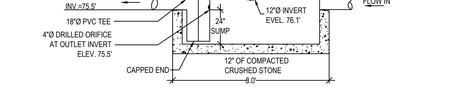
3 COLLECTOR PIPE
N.T.S



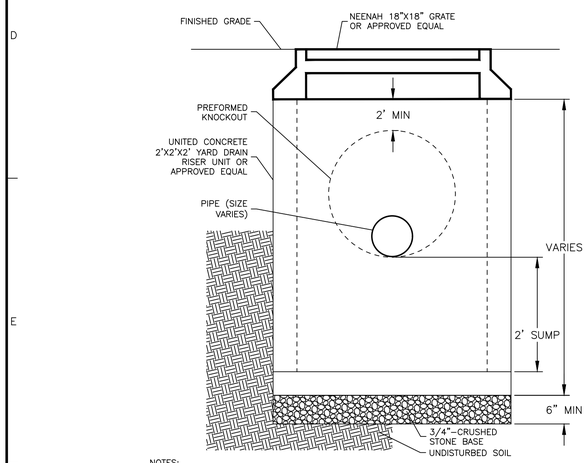
4 PERFORATED UNDERDRAIN
N.T.S



5 CATCH BASIN TOP
N.T.S

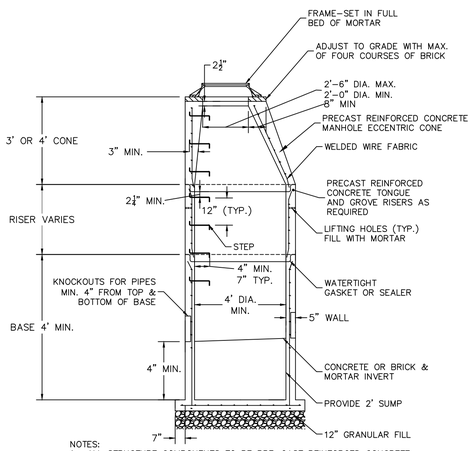


6 OUTLET CONTROL STRUCTURE (OCS-114)



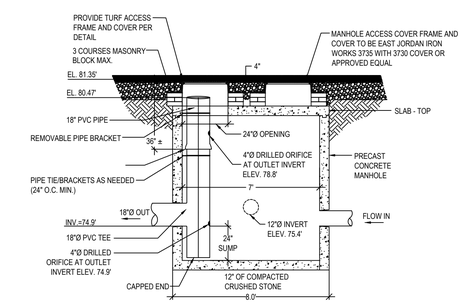
NOTES:
1. GRATES SHALL BE ROUND IN LAWN/FIELD AREAS AND SQUARE IN HARDSCAPE AREAS.
2. NEENAH ADA COMPLIANT TYPE "Q" GRATES OR APPROVED EQUAL (MAXIMUM SLOT OPENING 1/2" MAX.) SHALL BE USED IN ALL ADA ACCESSIBLE AREAS AND WHERE SPECIFIED. CONTRACTOR TO CONFIRM WHETHER OR NOT A GRATE IS LOCATED WITHIN AN ACCESSIBLE ROUTE.
3. GRATES SHALL BE CAPABLE OF H20 LOADING.

7 YARD DRAIN
N.T.S



NOTES:
1. ALL STRUCTURE COMPONENTS TO BE PRE-CAST REINFORCED CONCRETE, ABLE TO WITHSTAND THE APPLIED EARTH LOADS WITH AN HS-20 TRUCK LOAD.
2. ALL JOINTS TO BE MORTARED.
3. STRUCTURE SHALL CONFORM TO ASTM C478.

8 STORM MANHOLE
N.T.S



9 OUTLET CONTROL STRUCTURE (OCS-116)

8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1
Date	Description	No.

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Project

WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

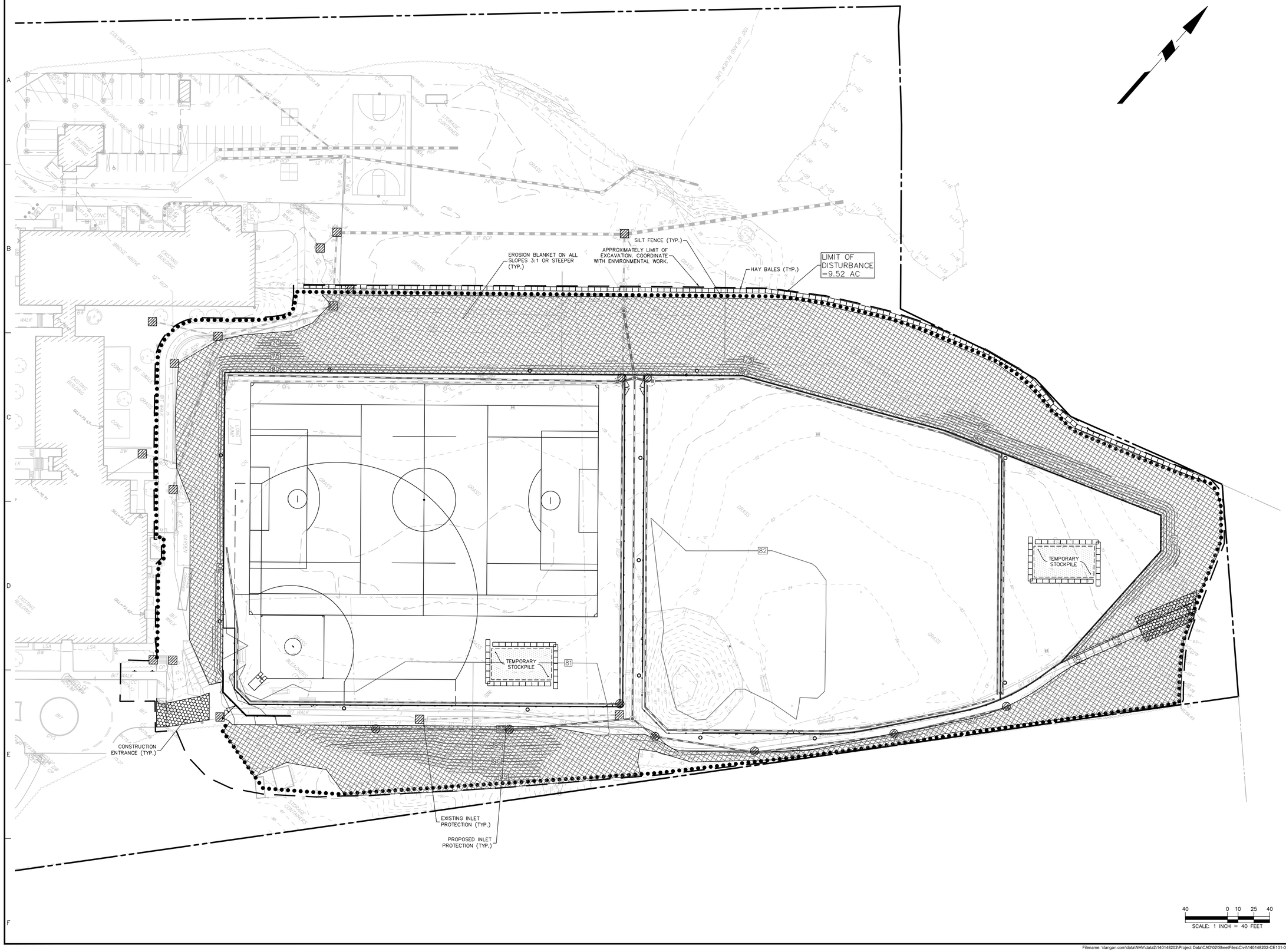
GREENWICH **CONNECTICUT**

Drawing Title

GRADING & DRAINAGE DETAILS

Project No.	Drawing No.
140148202	CG501
Date: 6/17/2022	
Drawn By: BTW	
Checked By: BP	Sheet 7 of 9

PROJECT NO. 140148202



Date	Description	No.
8/11/2022	RESPONSE TO TOWN ENGINEER'S COMMENTS	1

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WESTERN MIDDLE SCHOOL

1 WESTERN JUNIOR HIGHWAY

GREENWICH **CONNECTICUT**

Drawing Title

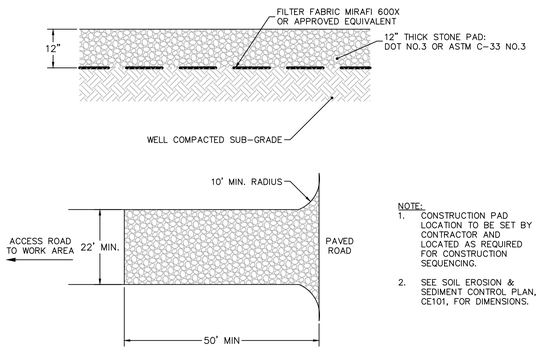
SOIL EROSION & SEDIMENT CONTROL PLAN

Project No.	Drawing No.
140148202	CE101
Date: **6/17/2022**	
Drawn By: **BTW**	
Checked By: **BP**	Sheet 8 of 9

LANGAN

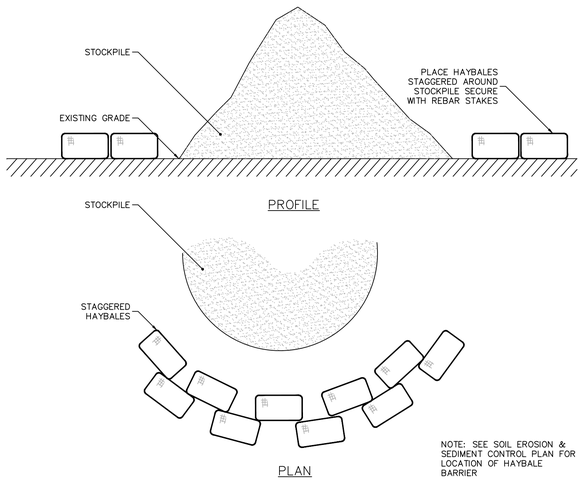
PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Civil\140148202-CE101-0101.dwg Date: 8/11/2022 Time: 10:18 User: bwillsey Style Table: Langan.stb Layout: CE101



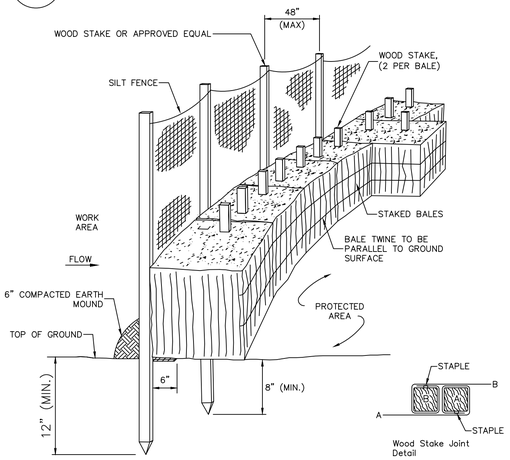
NOTE:
1. CONSTRUCTION PAD LOCATION TO BE SET BY CONTRACTOR AND LOCATED AS REQUIRED FOR CONSTRUCTION SEQUENCING.
2. SEE SOIL EROSION & SEDIMENT CONTROL PLAN, CE101, FOR DIMENSIONS.

1 CONSTRUCTION ENTRANCE
N.T.S



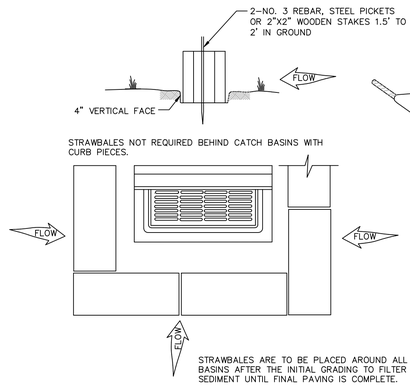
NOTE: SEE SOIL EROSION & SEDIMENT CONTROL PLAN FOR LOCATION OF HAYBALE BARRIER

4 TEMPORARY STOCKPILE
N.T.S

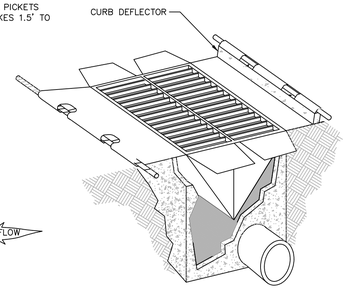


6 STAKED HAY BALES/SILT FENCE
N.T.S

SECURE "SILTSACK" FILTER
(OR EQUIVALENT) TO GRATE.

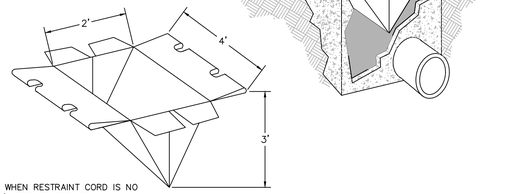


STRAWBALES ARE TO BE PLACED AROUND ALL CATCH BASINS AFTER THE INITIAL GRADING TO FILTER AND DIVERT SEDIMENT UNTIL FINAL PAVING IS COMPLETE.



TYPE B – CURB INLET

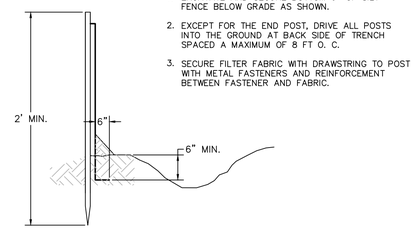
"SILTSACK"
DISTRIBUTOR:
ACS ENVIRONMENTAL
800-644-9223



NOTES:
1. CONTRACTOR IS TO CLEAN INLET FILTER WHEN RESTRAINT CORD IS NO LONGER VISIBLE AS PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR TO REMOVE FILTER JUST PRIOR TO PAVING.

2 INLET PROTECTION
N.T.S

INSTALLATION NOTES:
1. EXCAVATE AND SECURE BOTTOM 6" OF SILT FENCE BELOW GRADE AS SHOWN.
2. EXCEPT FOR THE END POST, DRIVE ALL POSTS INTO THE GROUND AT BACK SIDE OF TRENCH SPACED A MAXIMUM OF 8 FT O. C.
3. SECURE FILTER FABRIC WITH DRAWSTRING TO POST WITH METAL FASTENERS AND REINFORCEMENT BETWEEN FASTENER AND FABRIC.



3 SILT FENCE
N.T.S

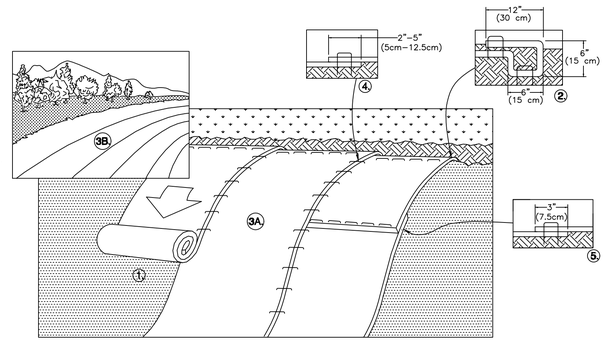
NORTH AMERICAN GREEN
EROSION CONTROL *Products*
Guaranteed SOLUTIONS

14649 HIGHWAY 41 NORTH
EVANSVILLE, IN 47725
800-772-2040
www.nagreen.com

BIONET SC150BN DOUBLE NET STRAW BLANKET – BIODEGRADABLE (OR APPROVED EQUAL)

SLOPE INSTALLATION

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM® , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.



NOTE:
CONTRACTOR TO PROVIDE EROSION CONTROL BLANKET ON ALL SLOPES 3:1 OR STEEPER.

5 SLOPE STABILIZATION (SLOPES ≥3H:1V)
N.T.S

No.	Description	Date
1	RESPONSE TO TOWN ENGINEER'S COMMENTS	8/11/2022

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Project
WESTERN MIDDLE SCHOOL
1 WESTERN JUNIOR HIGHWAY
GREENWICH CONNECTICUT

Drawing Title
SOIL EROSION & SEDIMENT CONTROL DETAILS

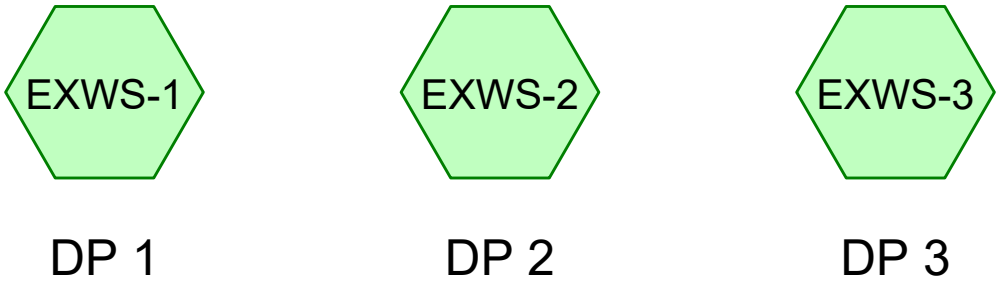
Project No.	Drawing No.
140148202	CE501
Date: 6/17/2022	
Drawn By: BTW	
Checked By: BP	Sheet 9 of 9

LANGAN
PROJECT NO. 140148202

Filename: \\langan.com\data\NHV\data2\140148202\Project Data\CAD\02\SheetFiles\Civil\140148202-CE501-0101.dwg Date: 8/11/2022 Time: 10:18 User: bwillsey Style Table: Langan.stb Layout: CE501

APPENDIX A

Existing Stormwater Discharge Calculations



Subcat Reach Pond Link

Routing Diagram for 2022-08-11 EX WS

Prepared by Langan Engineering and Environmental Services, Printed 8/11/2022

HydroCAD® 10.10-6a s/n 11011 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.97	79	50-75% Grass cover, Fair, HSG C (EXWS-1, EXWS-2, EXWS-3)
0.74	84	50-75% Grass cover, Fair, HSG D (EXWS-1)
0.34	74	>75% Grass cover, Good, HSG C (EXWS-1, EXWS-3)
0.28	98	Paved parking, HSG C (EXWS-1, EXWS-3)
0.21	98	Paved parking, HSG D (EXWS-1)
1.93	70	Woods, Good, HSG C (EXWS-1, EXWS-2, EXWS-3)
0.03	82	Woods/grass comb., Fair, HSG D (EXWS-1)
10.50	**78**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=1.18"
Flow Length=679' Tc=12 min CN=80 Runoff=6.96 cfs 26,925 CF

Subcatchment EXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=0.95"
Flow Length=326' Tc=14 min CN=76 Runoff=1.84 cfs 7,883 CF

Subcatchment EXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=1.00"
Flow Length=580' Tc=20 min CN=77 Runoff=1.44 cfs 6,913 CF

Total Runoff Area = 10.50 ac Runoff Volume = 41,721 CF Average Runoff Depth = 1.09"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=1.56"
Flow Length=679' Tc=12 min CN=80 Runoff=9.35 cfs 35,673 CF

Subcatchment EXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=1.29"
Flow Length=326' Tc=14 min CN=76 Runoff=2.57 cfs 10,750 CF

Subcatchment EXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=1.36"
Flow Length=580' Tc=20 min CN=77 Runoff=1.99 cfs 9,357 CF

Total Runoff Area = 10.50 ac Runoff Volume = 55,780 CF Average Runoff Depth = 1.46"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=2.29"
Flow Length=679' Tc=12 min CN=80 Runoff=13.88 cfs 52,500 CF

Subcatchment EXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=1.97"
Flow Length=326' Tc=14 min CN=76 Runoff=4.01 cfs 16,388 CF

Subcatchment EXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=2.05"
Flow Length=580' Tc=20 min CN=77 Runoff=3.06 cfs 14,134 CF

Total Runoff Area = 10.50 ac Runoff Volume = 83,022 CF Average Runoff Depth = 2.18"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentEXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=2.98"
Flow Length=679' Tc=12 min CN=80 Runoff=18.05 cfs 68,264 CF

SubcatchmentEXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=2.62"
Flow Length=326' Tc=14 min CN=76 Runoff=5.36 cfs 21,764 CF

SubcatchmentEXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=2.71"
Flow Length=580' Tc=20 min CN=77 Runoff=4.08 cfs 18,669 CF

Total Runoff Area = 10.50 ac Runoff Volume = 108,697 CF Average Runoff Depth = 2.85"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=4.14"
Flow Length=679' Tc=12 min CN=80 Runoff=24.99 cfs 94,921 CF

Subcatchment EXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=3.73"
Flow Length=326' Tc=14 min CN=76 Runoff=7.65 cfs 30,987 CF

Subcatchment EXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=3.83"
Flow Length=580' Tc=20 min CN=77 Runoff=5.78 cfs 26,420 CF

Total Runoff Area = 10.50 ac Runoff Volume = 152,328 CF Average Runoff Depth = 4.00"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

Summary for Subcatchment EXWS-1: DP 1

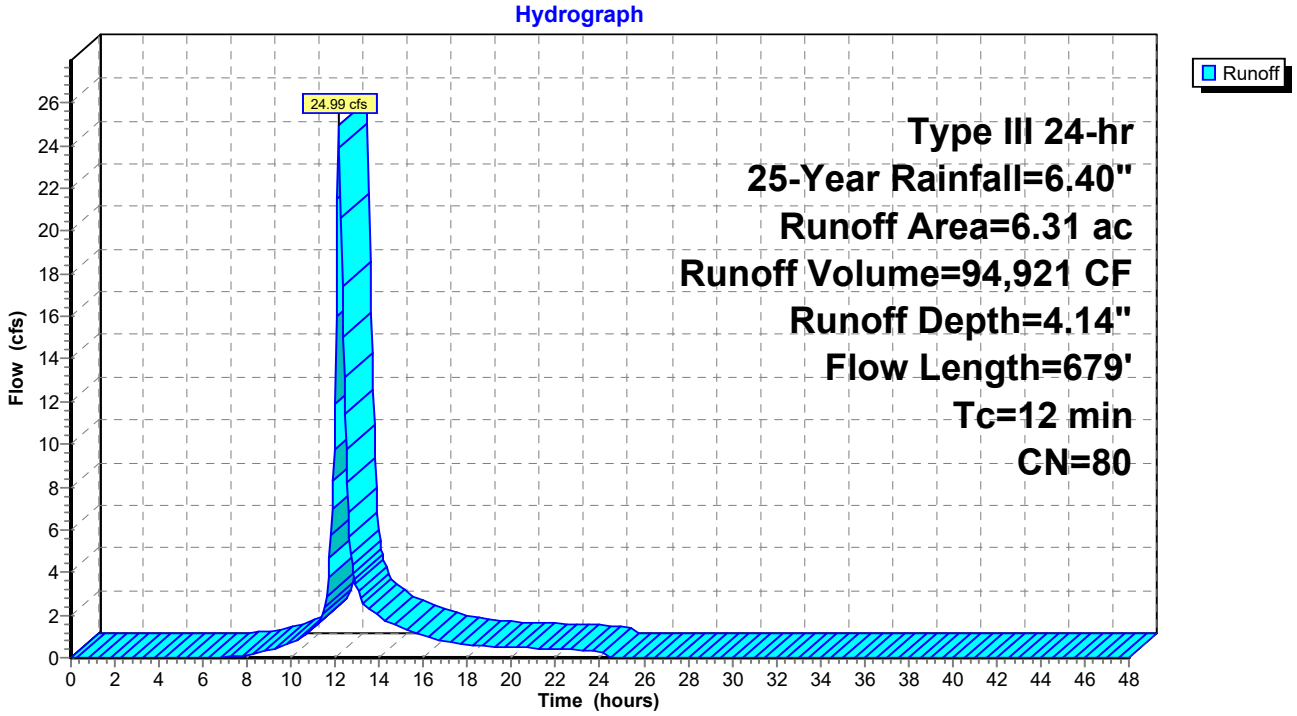
Runoff = 24.99 cfs @ 12.16 hrs, Volume= 94,921 CF, Depth= 4.14"
Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

Area (ac)	CN	Description
0.21	98	Paved parking, HSG D
0.74	84	50-75% Grass cover, Fair, HSG D
0.03	82	Woods/grass comb., Fair, HSG D
0.12	98	Paved parking, HSG C
4.74	79	50-75% Grass cover, Fair, HSG C
0.17	74	>75% Grass cover, Good, HSG C
0.30	70	Woods, Good, HSG C
6.31	80	Weighted Average
5.98		94.77% Pervious Area
0.33		5.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10	100	0.0160	0.16		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.52"
1	110	0.1600	2.80		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
1	314	0.0310	8.65	6.80	**Pipe Channel, CD** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0	155	0.0120	7.05	12.47	**Pipe Channel, DE** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
12	679	Total			

Subcatchment EXWS-1: DP 1



Summary for Subcatchment EXWS-2: DP 2

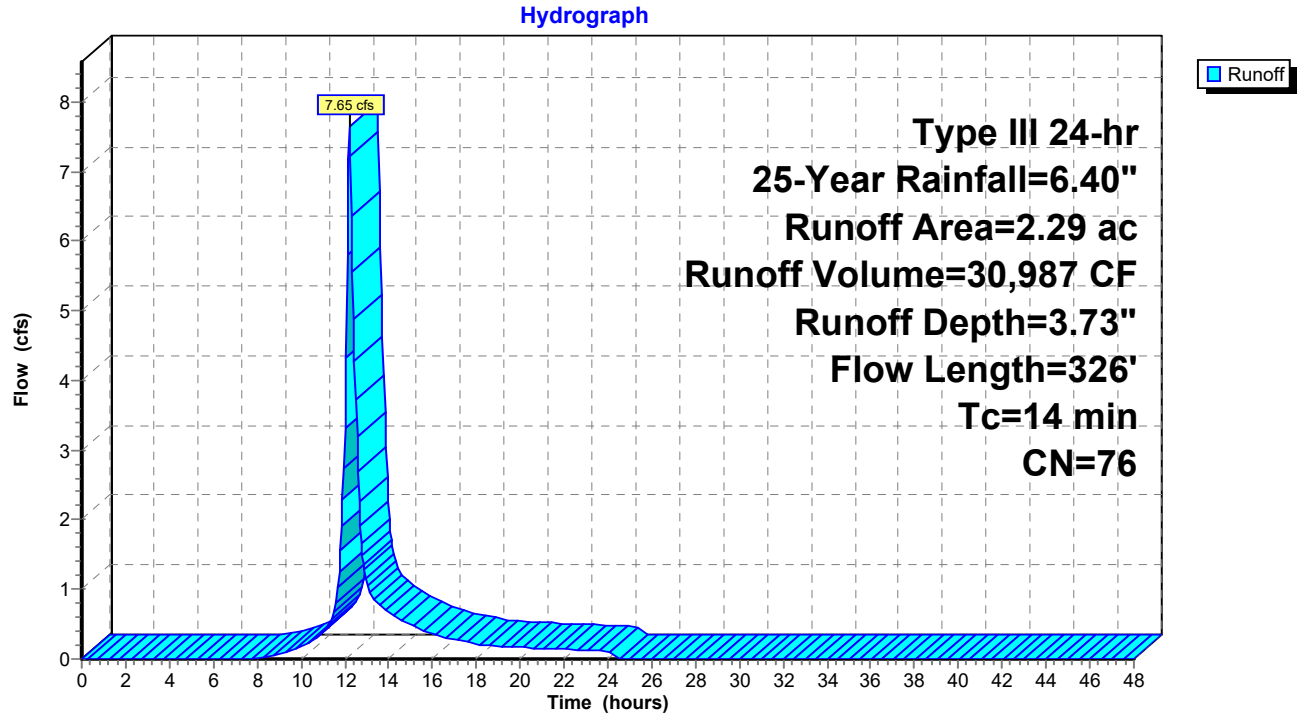
Runoff = 7.65 cfs @ 12.20 hrs, Volume= 30,987 CF, Depth= 3.73"
Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

Area (ac)	CN	Description
1.42	79	50-75% Grass cover, Fair, HSG C
0.87	70	Woods, Good, HSG C
2.29	76	Weighted Average
2.29		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9	100	0.0210	0.18		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.52"
1	138	0.2100	3.21		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
4	62	0.3700	0.23		**Sheet Flow, CD** Grass: Bermuda n= 0.410 P2= 3.52"
0	26	0.3700	3.04		**Shallow Concentrated Flow, DE** Woodland Kv= 5.0 fps
14	326	Total			

Subcatchment EXWS-2: DP 2



Summary for Subcatchment EXWS-3: DP 3

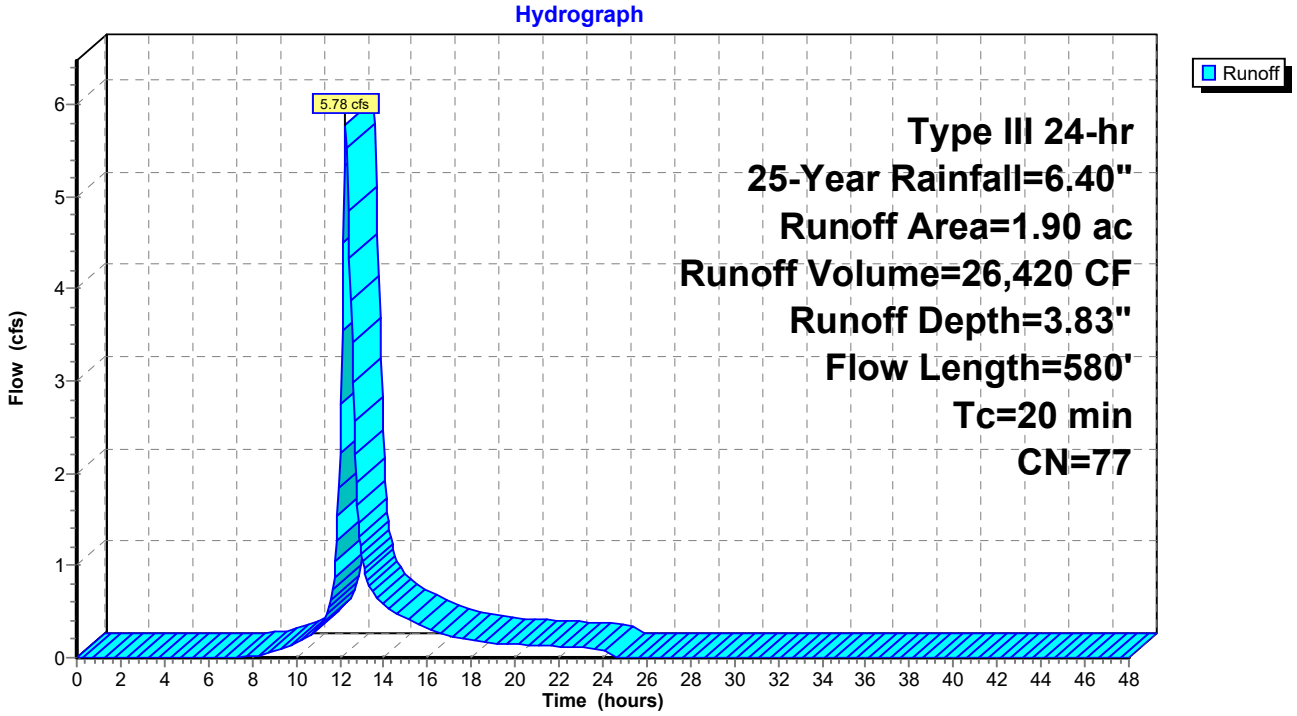
Runoff = 5.78 cfs @ 12.27 hrs, Volume= 26,420 CF, Depth= 3.83"
Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

Area (ac)	CN	Description
0.16	98	Paved parking, HSG C
0.76	70	Woods, Good, HSG C
0.81	79	50-75% Grass cover, Fair, HSG C
0.17	74	>75% Grass cover, Good, HSG C
1.90	77	Weighted Average
1.74		91.58% Pervious Area
0.16		8.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9	55	0.0180	0.10		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.52"
5	45	0.0180	0.15		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.52"
5	271	0.0180	0.94		**Shallow Concentrated Flow, CD** Short Grass Pasture Kv= 7.0 fps
1	54	0.0560	1.66		**Shallow Concentrated Flow, DE** Short Grass Pasture Kv= 7.0 fps
0	155	0.0730	5.48		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
20	580	Total			

Subcatchment EXWS-3: DP 3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=5.25"
Flow Length=679' Tc=12 min CN=80 Runoff=31.46 cfs 120,277 CF

Subcatchment EXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=4.80"
Flow Length=326' Tc=14 min CN=76 Runoff=9.82 cfs 39,862 CF

Subcatchment EXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=4.91"
Flow Length=580' Tc=20 min CN=77 Runoff=7.38 cfs 33,856 CF

Total Runoff Area = 10.50 ac Runoff Volume = 193,994 CF Average Runoff Depth = 5.09"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EXWS-1: DP 1 Runoff Area=6.31 ac 5.23% Impervious Runoff Depth=6.66"
Flow Length=679' Tc=12 min CN=80 Runoff=39.57 cfs 152,619 CF

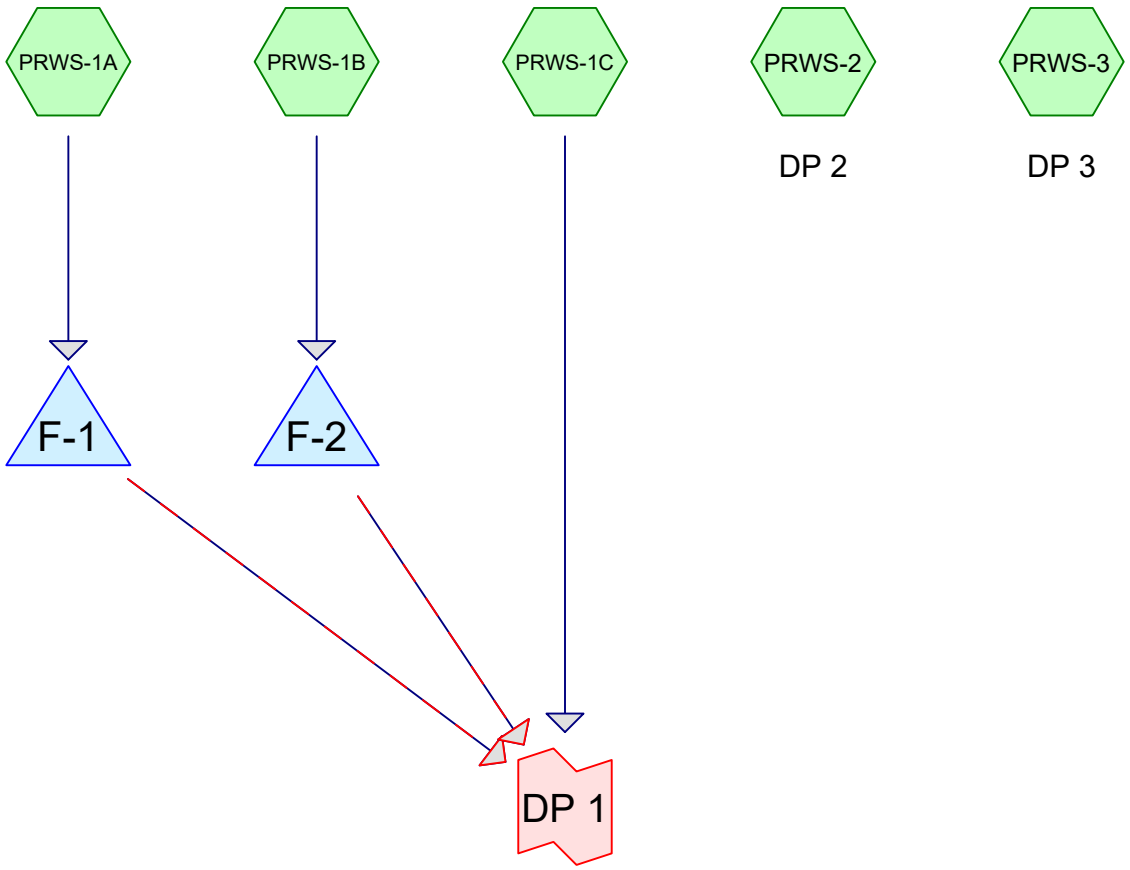
Subcatchment EXWS-2: DP 2 Runoff Area=2.29 ac 0.00% Impervious Runoff Depth=6.17"
Flow Length=326' Tc=14 min CN=76 Runoff=12.55 cfs 51,275 CF

Subcatchment EXWS-3: DP 3 Runoff Area=1.90 ac 8.42% Impervious Runoff Depth=6.29"
Flow Length=580' Tc=20 min CN=77 Runoff=9.40 cfs 43,397 CF

Total Runoff Area = 10.50 ac Runoff Volume = 247,291 CF Average Runoff Depth = 6.49"
95.33% Pervious = 10.01 ac 4.67% Impervious = 0.49 ac

APPENDIX B

Proposed Stormwater Discharge Calculations



Subcat Reach Pond Link

Routing Diagram for 2022-08-11 PR WS - no infiltration

Prepared by Langan Engineering and Environmental Services, Printed 8/11/2022

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.33	79	50-75% Grass cover, Fair, HSG C (PRWS-1C, PRWS-2)
0.34	84	50-75% Grass cover, Fair, HSG D (PRWS-1C)
0.01	74	>75% Grass cover, Good, HSG C (PRWS-1C)
0.78	98	Impervious (PRWS-1A, PRWS-1C, PRWS-3)
2.58	71	Meadow, HSG C (PRWS-1C, PRWS-2, PRWS-3)
0.40	78	Meadow, HSG D (PRWS-1C, PRWS-3)
5.64	98	Turf (PRWS-1A, PRWS-1B)
0.05	73	Woods, Fair, HSG C (PRWS-1C)
0.36	70	Woods, Good, HSG C (PRWS-2, PRWS-3)
0.00	77	Woods, Good, HSG D (PRWS-3)
10.49	**88**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=2.67"
Tc=6 min CN=98 Runoff=7.90 cfs 27,919 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=2.67"
Tc=6 min CN=98 Runoff=7.98 cfs 28,200 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=1.18"
Flow Length=156' Tc=7 min CN=80 Runoff=3.45 cfs 11,632 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=0.70"
Flow Length=146' Tc=6 min CN=71 Runoff=0.75 cfs 2,671 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=0.85"
Flow Length=232' Tc=7 min CN=74 Runoff=0.81 cfs 2,845 CF

Pond F-1: Peak Elev=79.34' Storage=8,377 cf Inflow=7.90 cfs 27,919 CF
Outflow=1.14 cfs 27,859 CF

Pond F-2: Peak Elev=79.58' Storage=8,216 cf Inflow=7.98 cfs 28,200 CF
Outflow=1.22 cfs 28,140 CF

Link DP 1: Inflow=5.69 cfs 67,631 CF
Primary=5.69 cfs 67,631 CF

Total Runoff Area = 10.49 ac Runoff Volume = 73,267 CF Average Runoff Depth = 1.92"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=3.17"
Tc=6 min CN=98 Runoff=9.30 cfs 33,130 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=3.17"
Tc=6 min CN=98 Runoff=9.40 cfs 33,463 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=1.56"
Flow Length=156' Tc=7 min CN=80 Runoff=4.63 cfs 15,411 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=1.00"
Flow Length=146' Tc=6 min CN=71 Runoff=1.12 cfs 3,800 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=1.17"
Flow Length=232' Tc=7 min CN=74 Runoff=1.16 cfs 3,942 CF

Pond F-1: Peak Elev=79.44' Storage=10,509 cf Inflow=9.30 cfs 33,130 CF
Outflow=1.18 cfs 33,070 CF

Pond F-2: Peak Elev=79.68' Storage=10,331 cf Inflow=9.40 cfs 33,463 CF
Outflow=1.26 cfs 33,403 CF

Link DP 1: Inflow=6.92 cfs 81,884 CF
Primary=6.92 cfs 81,884 CF

Total Runoff Area = 10.49 ac Runoff Volume = 89,746 CF Average Runoff Depth = 2.36"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=4.06"
Tc=6 min CN=98 Runoff=11.82 cfs 42,521 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=4.06"
Tc=6 min CN=98 Runoff=11.93 cfs 42,949 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=2.29"
Flow Length=156' Tc=7 min CN=80 Runoff=6.87 cfs 22,681 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=1.60"
Flow Length=146' Tc=6 min CN=71 Runoff=1.88 cfs 6,087 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=1.82"
Flow Length=232' Tc=7 min CN=74 Runoff=1.85 cfs 6,124 CF

Pond F-1: Peak Elev=79.64' Storage=14,619 cf Inflow=11.82 cfs 42,521 CF
Outflow=1.24 cfs 42,461 CF

Pond F-2: Peak Elev=79.86' Storage=14,384 cf Inflow=11.93 cfs 42,949 CF
Outflow=1.32 cfs 42,889 CF

Link DP 1: Inflow=9.23 cfs 108,030 CF
Primary=9.23 cfs 108,030 CF

Total Runoff Area = 10.49 ac Runoff Volume = 120,361 CF Average Runoff Depth = 3.16"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=4.86"
Tc=6 min CN=98 Runoff=14.04 cfs 50,875 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=4.86"
Tc=6 min CN=98 Runoff=14.19 cfs 51,387 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=2.98"
Flow Length=156' Tc=7 min CN=80 Runoff=8.93 cfs 29,491 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=2.19"
Flow Length=146' Tc=6 min CN=71 Runoff=2.61 cfs 8,324 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=2.44"
Flow Length=232' Tc=7 min CN=74 Runoff=2.52 cfs 8,225 CF

Pond F-1: Peak Elev=79.82' Storage=18,515 cf Inflow=14.04 cfs 50,875 CF
Outflow=1.30 cfs 50,815 CF

Pond F-2: Peak Elev=80.04' Storage=18,235 cf Inflow=14.19 cfs 51,387 CF
Outflow=1.37 cfs 51,327 CF

Link DP 1: Inflow=11.37 cfs 131,633 CF
Primary=11.37 cfs 131,633 CF

Total Runoff Area = 10.49 ac Runoff Volume = 148,303 CF Average Runoff Depth = 3.89"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=6.16"
Tc=6 min CN=98 Runoff=17.66 cfs 64,459 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=6.16"
Tc=6 min CN=98 Runoff=17.84 cfs 65,108 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=4.14"
Flow Length=156' Tc=7 min CN=80 Runoff=12.35 cfs 41,007 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=3.22"
Flow Length=146' Tc=6 min CN=71 Runoff=3.87 cfs 12,242 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=3.52"
Flow Length=232' Tc=7 min CN=74 Runoff=3.64 cfs 11,858 CF

Pond F-1: Peak Elev=80.14' Storage=25,363 cf Inflow=17.66 cfs 64,459 CF
Outflow=1.39 cfs 64,399 CF

Pond F-2: Peak Elev=80.34' Storage=24,985 cf Inflow=17.84 cfs 65,108 CF
Outflow=1.46 cfs 65,048 CF

Link DP 1: Inflow=14.91 cfs 170,453 CF
Primary=14.91 cfs 170,453 CF

Total Runoff Area = 10.49 ac Runoff Volume = 194,674 CF Average Runoff Depth = 5.11"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

Summary for Subcatchment PRWS-1A:

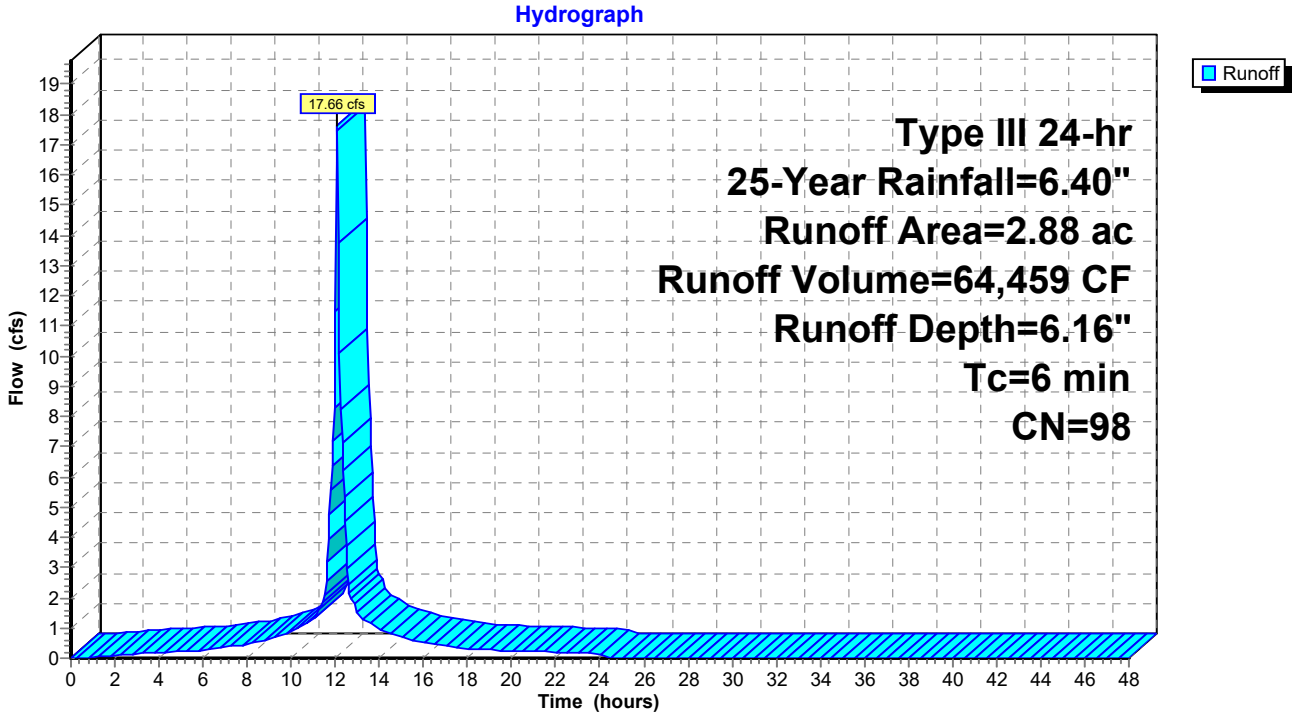
Runoff = 17.66 cfs @ 12.09 hrs, Volume= 64,459 CF, Depth= 6.16"
Routed to Pond F-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

	Area (ac)	CN	Description
*	2.73	98	Turf
*	0.15	98	Impervious
	2.88	98	Weighted Average
	2.88		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6					**Direct Entry,**

Subcatchment PRWS-1A:



Summary for Subcatchment PRWS-1B:

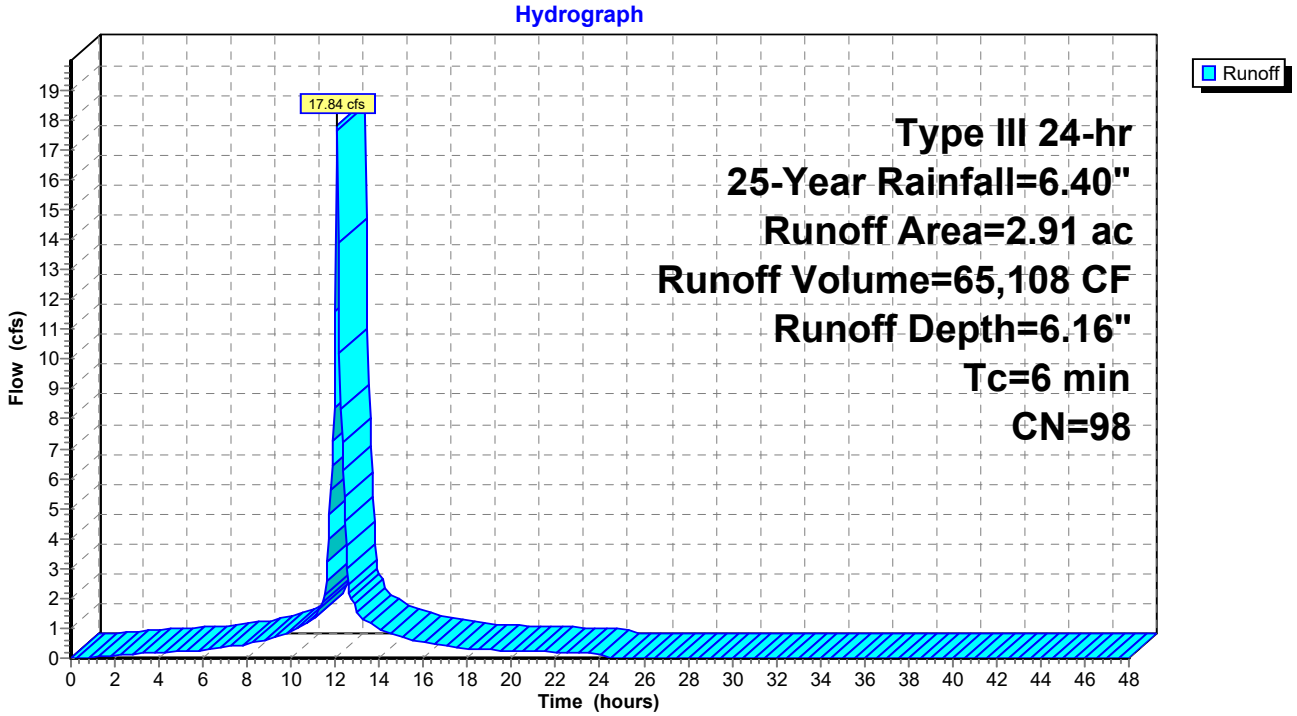
Runoff = 17.84 cfs @ 12.09 hrs, Volume= 65,108 CF, Depth= 6.16"
Routed to Pond F-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

	Area (ac)	CN	Description
*	2.91	98	Turf
	2.91		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6					**Direct Entry,**

Subcatchment PRWS-1B:



Summary for Subcatchment PRWS-1C:

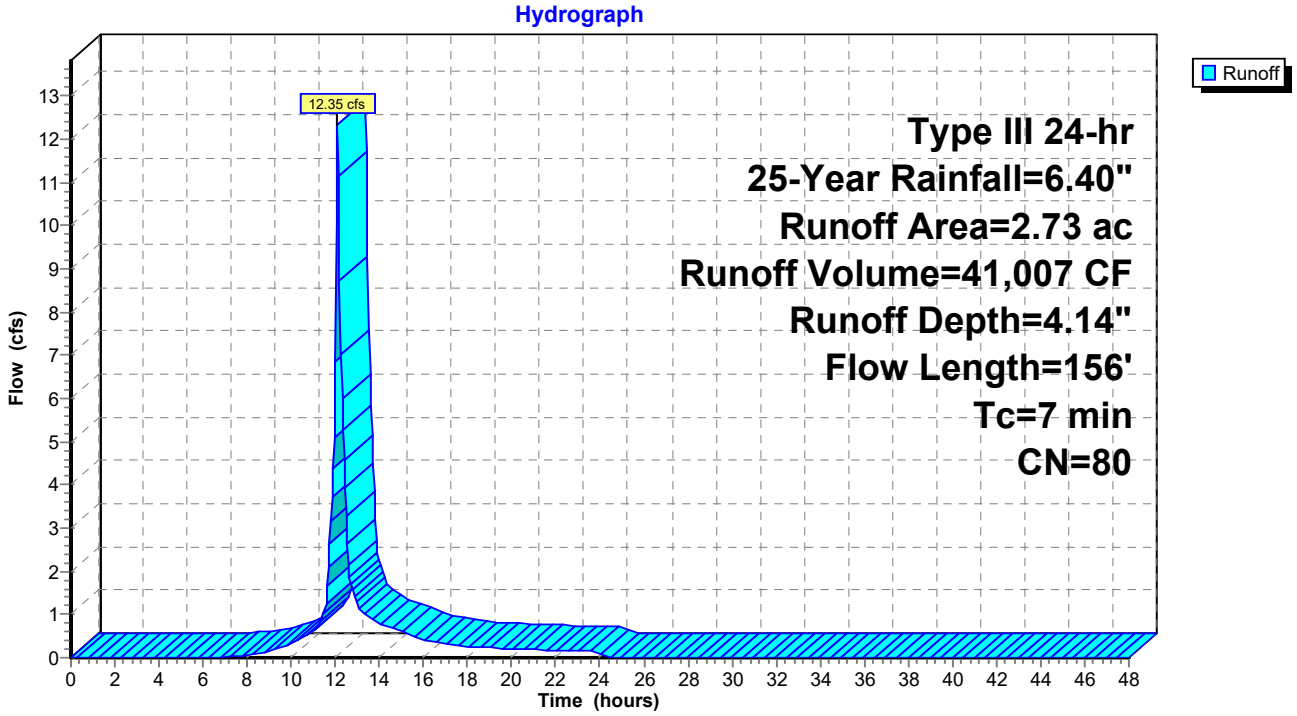
Runoff = 12.35 cfs @ 12.11 hrs, Volume= 41,007 CF, Depth= 4.14"
Routed to Link DP 1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

	Area (ac)	CN	Description
*	0.51	98	Impervious
*	0.38	78	Meadow, HSG D
*	1.15	71	Meadow, HSG C
	0.28	79	50-75% Grass cover, Fair, HSG C
	0.34	84	50-75% Grass cover, Fair, HSG D
	0.01	74	>75% Grass cover, Good, HSG C
	0.05	73	Woods, Fair, HSG C
	2.73	80	Weighted Average
	2.21		81.18% Pervious Area
	0.51		18.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4	84	0.2500	0.32		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.52"
2	16	0.0150	0.11		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.52"
1	41	0.0150	0.86		**Shallow Concentrated Flow, CD** Short Grass Pasture Kv= 7.0 fps
0	15	0.0200	11.30	56.59	**Pipe Channel, DE** 36.0" Round w/ 12.0" inside fill Area= 5.0 sf Perim= 8.6' r= 0.58' n= 0.013 Corrugated PE, smooth interior
7	156	Total			

Subcatchment PRWS-1C:



Summary for Subcatchment PRWS-2: DP 2

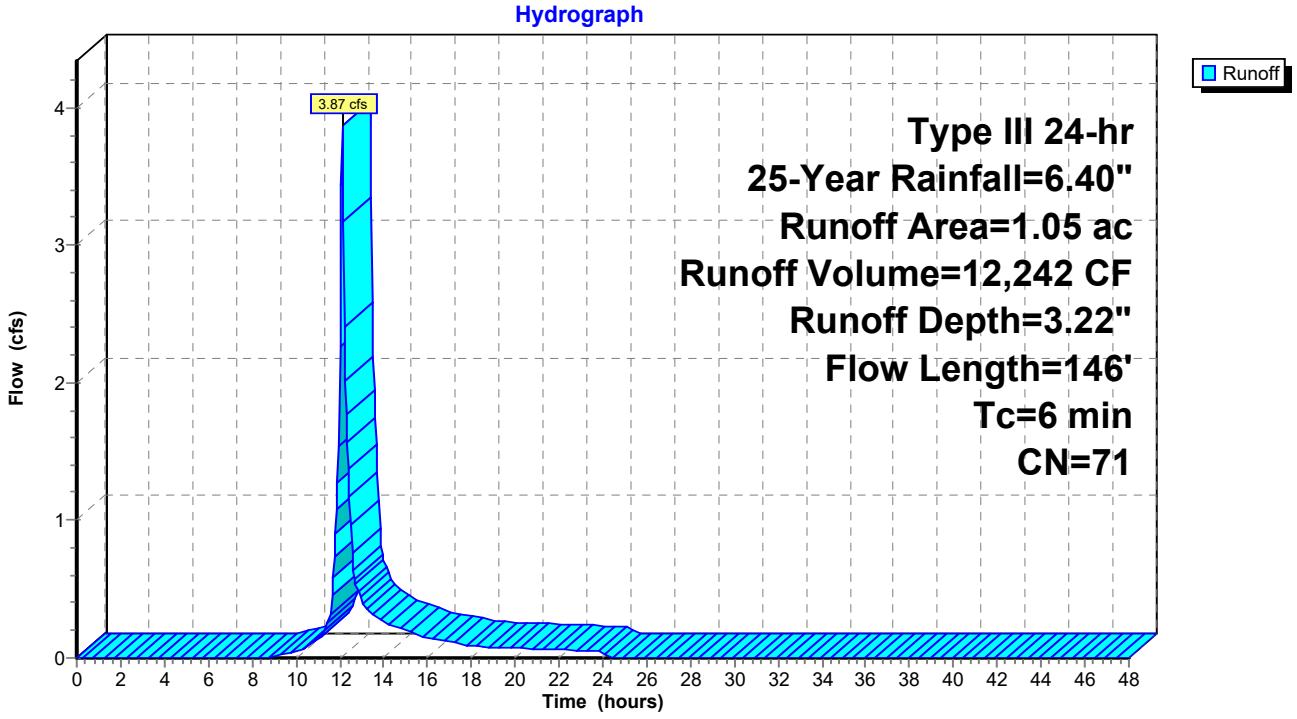
Runoff = 3.87 cfs @ 12.09 hrs, Volume= 12,242 CF, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

	Area (ac)	CN	Description
*	0.84	71	Meadow, HSG C
	0.15	70	Woods, Good, HSG C
	0.05	79	50-75% Grass cover, Fair, HSG C
	1.05	71	Weighted Average
	1.05		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4	82	0.2800	0.34		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.52"
0	18	0.1110	1.67		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
0	46	0.3300	2.87		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
4	146	Total, Increased to minimum Tc = 6 min			

Subcatchment PRWS-2: DP 2



Summary for Subcatchment PRWS-3: DP 3

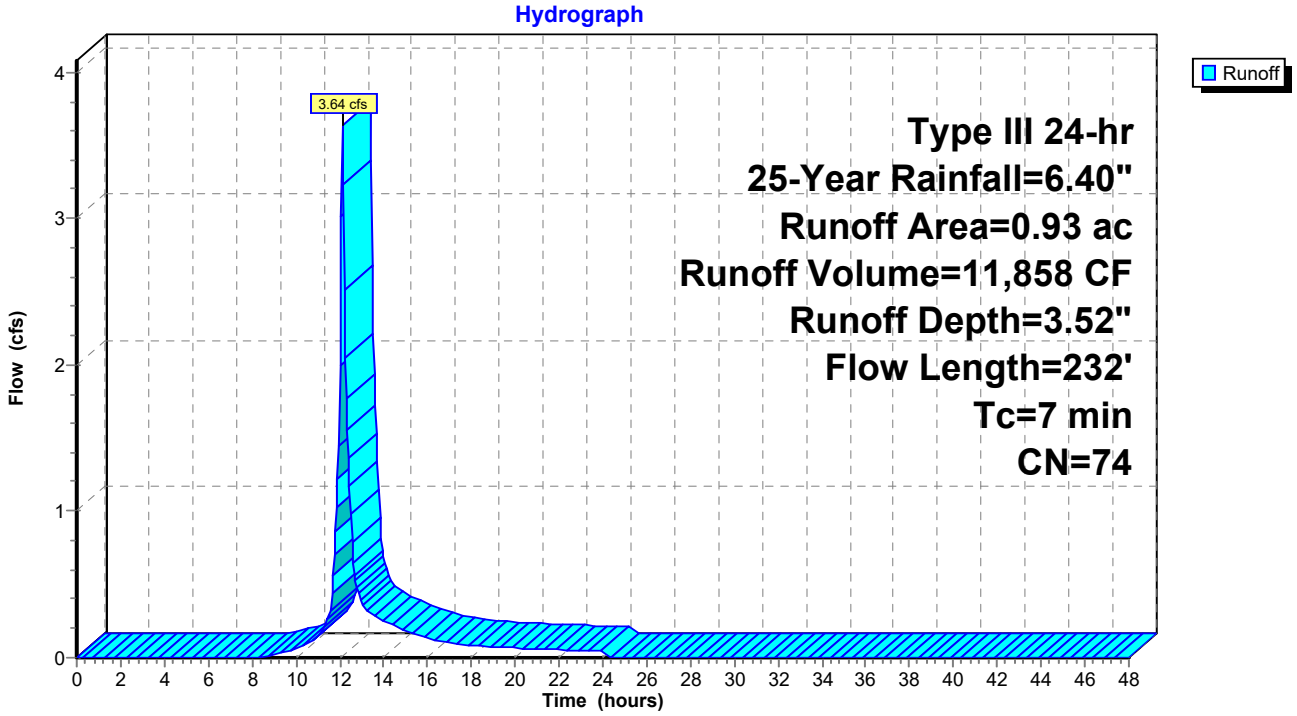
Runoff = 3.64 cfs @ 12.11 hrs, Volume= 11,858 CF, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.40"

	Area (ac)	CN	Description
*	0.58	71	Meadow, HSG C
*	0.01	78	Meadow, HSG D
	0.21	70	Woods, Good, HSG C
	0.00	77	Woods, Good, HSG D
*	0.12	98	Impervious
	0.93	74	Weighted Average
	0.81		87.38% Pervious Area
	0.12		12.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7	100	0.1200	0.25		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.52"
0	28	0.1120	2.34		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0	104	0.0710	5.41		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
7	232	Total			

Subcatchment PRWS-3: DP 3



Summary for Pond F-1:

Inflow Area = 2.88 ac,100.00% Impervious, Inflow Depth = 6.16" for 25-Year event
Inflow = 17.66 cfs @ 12.09 hrs, Volume= 64,459 CF
Outflow = 1.39 cfs @ 13.08 hrs, Volume= 64,399 CF, Atten= 92%, Lag= 59.9 min
Primary = 1.39 cfs @ 13.08 hrs, Volume= 64,399 CF
Routed to Link DP 1 :

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 80.14' @ 13.08 hrs Surf.Area= 93,614 sf Storage= 25,363 cf

Plug-Flow detention time= 148.2 min calculated for 64,399 CF (100% of inflow)
Center-of-Mass det. time= 147.5 min (891.7 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	74.00'	8,051 cf	**Exfiltration Surface Area (Prismatic)** Listed below (Recalc)
#2	78.96'	31,984 cf	**Stone Storage Volume** Listed below 79,960 cf Overall x 40.0% Voids
		40,035 cf	Total Available Storage

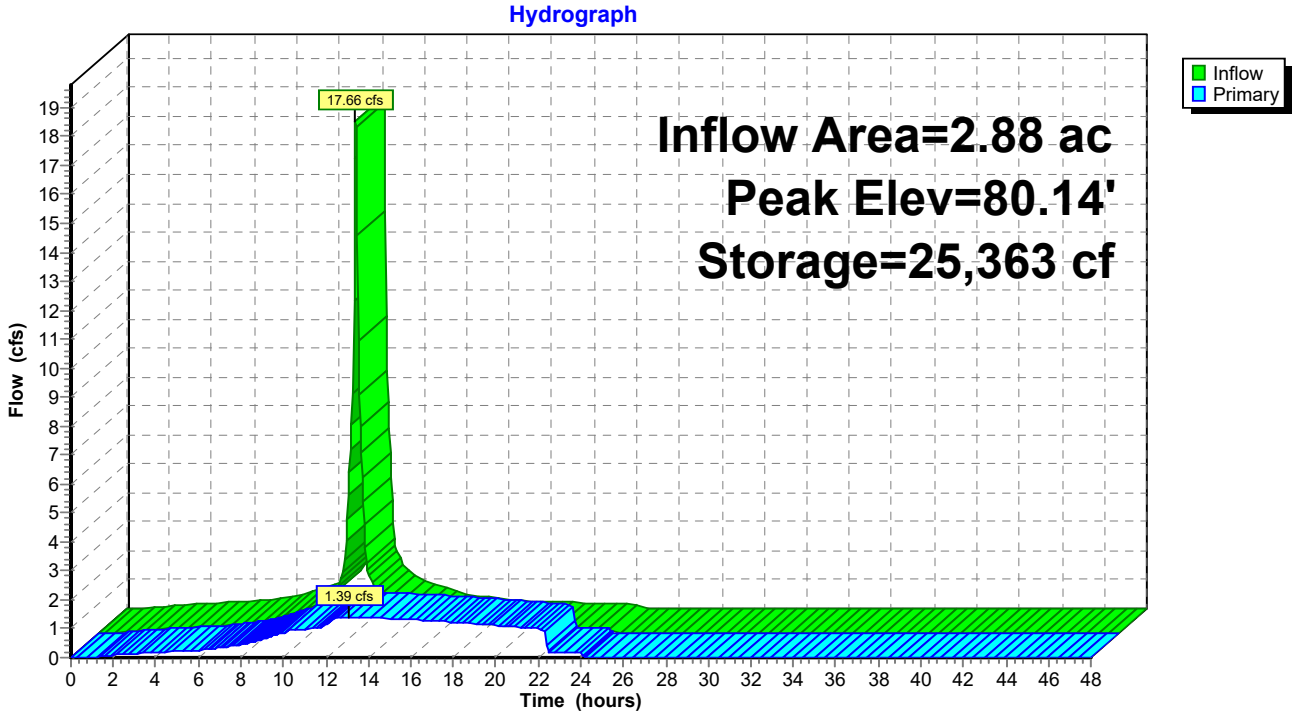
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.00	40	0.0	0	0
75.50	40	100.0	60	60
78.96	40	100.0	138	198
80.46	118,973	0.0	0	198
80.63	118,973	20.0	4,045	4,243
80.79	118,973	20.0	3,807	8,051

Elevation (feet)	Cum.Store (cubic-feet)
78.96	0
80.46	79,960

Device	Routing	Invert	Outlet Devices
#1	Primary	75.50'	**18.0" Round Outlet Pipe** L= 8.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.50' / 75.46' S= 0.0047 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	75.50'	**4.0" Vert. Low Flow Orifice 1** C= 0.600 Limited to weir flow at low heads
#3	Device 1	78.54'	**4.0" Vert. Low Flow Orifice 2** C= 0.600 Limited to weir flow at low heads
#4	Device 1	80.21'	**18.0" Horiz. Vertical Orifice** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.39 cfs @ 13.08 hrs HW=80.14' (Free Discharge)
└─**1=Outlet Pipe** (Passes 1.39 cfs of 13.25 cfs potential flow)
  ├─**2=Low Flow Orifice 1** (Orifice Controls 0.89 cfs @ 10.18 fps)
  ├─**3=Low Flow Orifice 2** (Orifice Controls 0.50 cfs @ 5.76 fps)
  └─**4=Vertical Orifice** (Controls 0.00 cfs)

Pond F-1:



Stage-Discharge for Pond F-1:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
74.00	0.00	76.55	0.39	79.10	1.04
74.05	0.00	76.60	0.41	79.15	1.06
74.10	0.00	76.65	0.42	79.20	1.08
74.15	0.00	76.70	0.43	79.25	1.11
74.20	0.00	76.75	0.44	79.30	1.12
74.25	0.00	76.80	0.45	79.35	1.14
74.30	0.00	76.85	0.46	79.40	1.16
74.35	0.00	76.90	0.47	79.45	1.18
74.40	0.00	76.95	0.48	79.50	1.20
74.45	0.00	77.00	0.49	79.55	1.21
74.50	0.00	77.05	0.49	79.60	1.23
74.55	0.00	77.10	0.50	79.65	1.25
74.60	0.00	77.15	0.51	79.70	1.26
74.65	0.00	77.20	0.52	79.75	1.28
74.70	0.00	77.25	0.53	79.80	1.29
74.75	0.00	77.30	0.54	79.85	1.31
74.80	0.00	77.35	0.55	79.90	1.32
74.85	0.00	77.40	0.55	79.95	1.34
74.90	0.00	77.45	0.56	80.00	1.35
74.95	0.00	77.50	0.57	80.05	1.37
75.00	0.00	77.55	0.58	80.10	1.38
75.05	0.00	77.60	0.58	80.15	1.39
75.10	0.00	77.65	0.59	80.20	1.41
75.15	0.00	77.70	0.60	80.25	1.54
75.20	0.00	77.75	0.61	80.30	1.85
75.25	0.00	77.80	0.61	80.35	2.26
75.30	0.00	77.85	0.62	80.40	2.74
75.35	0.00	77.90	0.63	80.45	3.29
75.40	0.00	77.95	0.63	80.50	3.89
75.45	0.00	78.00	0.64	80.55	4.55
75.50	0.00	78.05	0.65	80.60	5.26
75.55	0.01	78.10	0.66	80.65	6.02
75.60	0.02	78.15	0.66	80.70	6.82
75.65	0.05	78.20	0.67	80.75	**7.66**
75.70	0.08	78.25	0.68		
75.75	0.12	78.30	0.68		
75.80	0.15	78.35	0.69		
75.85	0.18	78.40	0.69		
75.90	0.20	78.45	0.70		
75.95	0.22	78.50	0.71		
76.00	0.24	78.55	0.71		
76.05	0.26	78.60	0.73		
76.10	0.28	78.65	0.75		
76.15	0.29	78.70	0.79		
76.20	0.31	78.75	0.83		
76.25	0.32	78.80	0.87		
76.30	0.33	78.85	0.91		
76.35	0.35	78.90	0.94		
76.40	0.36	78.95	0.97		
76.45	0.37	79.00	0.99		
76.50	0.38	79.05	1.02		

Stage-Area-Storage for Pond F-1:

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
74.00	0	76.55	102	79.10	3,184
74.05	2	76.60	104	79.15	4,250
74.10	4	76.65	106	79.20	5,316
74.15	6	76.70	108	79.25	6,382
74.20	8	76.75	110	79.30	7,448
74.25	10	76.80	112	79.35	8,514
74.30	12	76.85	114	79.40	9,580
74.35	14	76.90	116	79.45	10,647
74.40	16	76.95	118	79.50	11,713
74.45	18	77.00	120	79.55	12,779
74.50	20	77.05	122	79.60	13,845
74.55	22	77.10	124	79.65	14,911
74.60	24	77.15	126	79.70	15,977
74.65	26	77.20	128	79.75	17,043
74.70	28	77.25	130	79.80	18,109
74.75	30	77.30	132	79.85	19,176
74.80	32	77.35	134	79.90	20,242
74.85	34	77.40	136	79.95	21,308
74.90	36	77.45	138	80.00	22,374
74.95	38	77.50	140	80.05	23,440
75.00	40	77.55	142	80.10	24,506
75.05	42	77.60	144	80.15	25,572
75.10	44	77.65	146	80.20	26,639
75.15	46	77.70	148	80.25	27,705
75.20	48	77.75	150	80.30	28,771
75.25	50	77.80	152	80.35	29,837
75.30	52	77.85	154	80.40	30,903
75.35	54	77.90	156	80.45	31,969
75.40	56	77.95	158	80.50	33,134
75.45	58	78.00	160	80.55	34,324
75.50	60	78.05	162	80.60	35,514
75.55	62	78.10	164	80.65	36,703
75.60	64	78.15	166	80.70	37,893
75.65	66	78.20	168	80.75	**39,083**
75.70	68	78.25	170		
75.75	70	78.30	172		
75.80	72	78.35	174		
75.85	74	78.40	176		
75.90	76	78.45	178		
75.95	78	78.50	180		
76.00	80	78.55	182		
76.05	82	78.60	184		
76.10	84	78.65	186		
76.15	86	78.70	188		
76.20	88	78.75	190		
76.25	90	78.80	192		
76.30	92	78.85	194		
76.35	94	78.90	196		
76.40	96	78.95	198		
76.45	98	79.00	1,051		
76.50	100	79.05	2,117		

Summary for Pond F-2:

Inflow Area = 2.91 ac,100.00% Impervious, Inflow Depth = 6.16" for 25-Year event
Inflow = 17.84 cfs @ 12.09 hrs, Volume= 65,108 CF
Outflow = 1.46 cfs @ 13.05 hrs, Volume= 65,048 CF, Atten= 92%, Lag= 57.5 min
Primary = 1.46 cfs @ 13.05 hrs, Volume= 65,048 CF
Routed to Link DP 1 :

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 80.34' @ 13.05 hrs Surf.Area= 94,861 sf Storage= 24,985 cf

Plug-Flow detention time= 135.8 min calculated for 65,048 CF (100% of inflow)
Center-of-Mass det. time= 135.0 min (879.2 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	79.22'	33,074 cf	**Stone Storage Volume** Listed below 82,685 cf Overall x 40.0% Voids
#2	73.40'	8,851 cf	**Exfiltration Surface Area (Prismatic)** Listed below (Recalc)
		41,925 cf	Total Available Storage

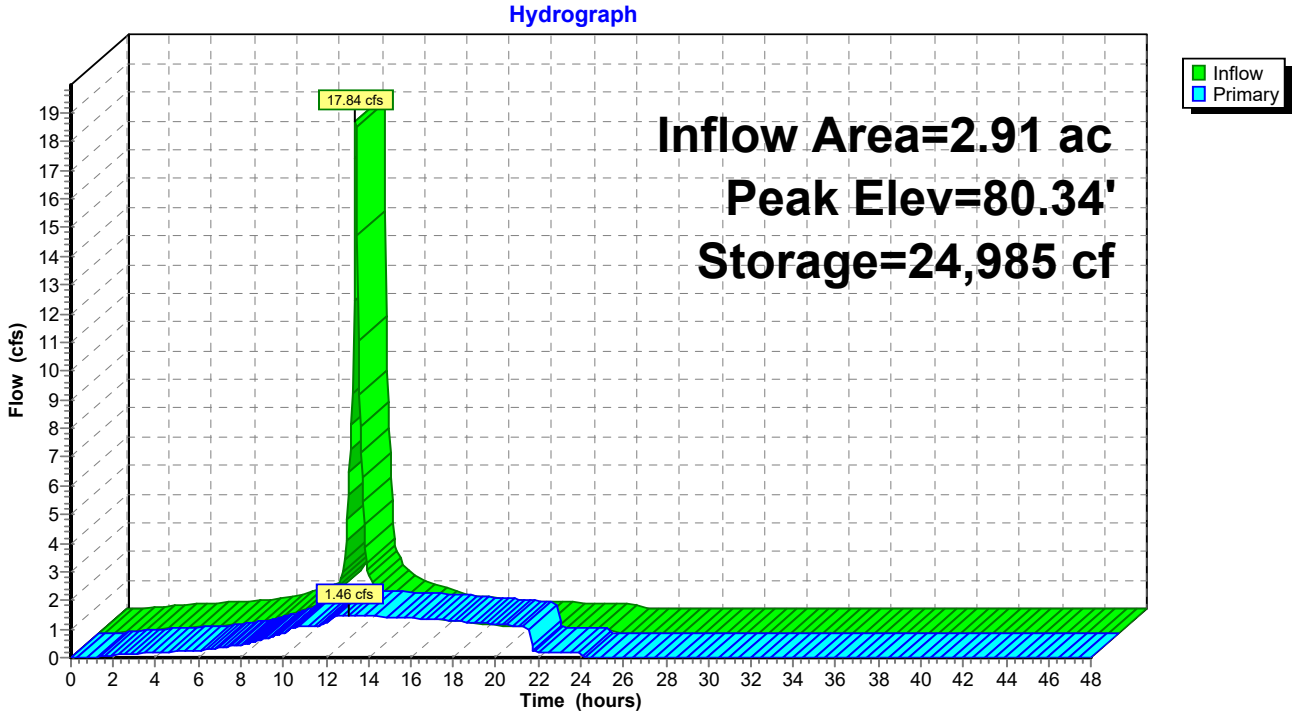
Elevation (feet)	Cum.Store (cubic-feet)
79.22	0
80.72	82,685

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.40	40	0.0	0	0
74.90	40	100.0	60	60
79.22	40	100.0	173	233
80.72	126,738	0.0	0	233
80.89	126,738	20.0	4,309	4,542
81.06	126,738	20.0	4,309	8,851

Device	Routing	Invert	Outlet Devices
#1	Primary	74.90'	**18.0" Round Outlet Pipe** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.90' / 74.84' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	80.47'	**18.0" Horiz. Vertical Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	74.90'	**4.0" Vert. Low Flow Orifice 1** C= 0.600 Limited to weir flow at low heads
#4	Device 1	78.80'	**4.0" Vert. Low Flow Orifice 2** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.46 cfs @ 13.05 hrs HW=80.34' (Free Discharge)
└─**1=Outlet Pipe** (Passes 1.46 cfs of 14.55 cfs potential flow)
  ├─**2=Vertical Orifice** (Controls 0.00 cfs)
  ├─**3=Low Flow Orifice 1** (Orifice Controls 0.97 cfs @ 11.06 fps)
  └─**4=Low Flow Orifice 2** (Orifice Controls 0.49 cfs @ 5.65 fps)

Pond F-2:



Stage-Discharge for Pond F-2:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
73.40	0.00	75.95	0.39	78.50	0.78	81.05	**8.11**
73.45	0.00	76.00	0.41	78.55	0.78		
73.50	0.00	76.05	0.42	78.60	0.79		
73.55	0.00	76.10	0.43	78.65	0.80		
73.60	0.00	76.15	0.44	78.70	0.80		
73.65	0.00	76.20	0.45	78.75	0.81		
73.70	0.00	76.25	0.46	78.80	0.81		
73.75	0.00	76.30	0.47	78.85	0.82		
73.80	0.00	76.35	0.48	78.90	0.85		
73.85	0.00	76.40	0.49	78.95	0.88		
73.90	0.00	76.45	0.49	79.00	0.92		
73.95	0.00	76.50	0.50	79.05	0.96		
74.00	0.00	76.55	0.51	79.10	1.00		
74.05	0.00	76.60	0.52	79.15	1.03		
74.10	0.00	76.65	0.53	79.20	1.06		
74.15	0.00	76.70	0.54	79.25	1.08		
74.20	0.00	76.75	0.55	79.30	1.11		
74.25	0.00	76.80	0.55	79.35	1.13		
74.30	0.00	76.85	0.56	79.40	1.15		
74.35	0.00	76.90	0.57	79.45	1.17		
74.40	0.00	76.95	0.58	79.50	1.19		
74.45	0.00	77.00	0.58	79.55	1.21		
74.50	0.00	77.05	0.59	79.60	1.23		
74.55	0.00	77.10	0.60	79.65	1.25		
74.60	0.00	77.15	0.61	79.70	1.26		
74.65	0.00	77.20	0.61	79.75	1.28		
74.70	0.00	77.25	0.62	79.80	1.30		
74.75	0.00	77.30	0.63	79.85	1.31		
74.80	0.00	77.35	0.63	79.90	1.33		
74.85	0.00	77.40	0.64	79.95	1.35		
74.90	0.00	77.45	0.65	80.00	1.36		
74.95	0.01	77.50	0.66	80.05	1.38		
75.00	0.02	77.55	0.66	80.10	1.39		
75.05	0.05	77.60	0.67	80.15	1.40		
75.10	0.08	77.65	0.68	80.20	1.42		
75.15	0.12	77.70	0.68	80.25	1.43		
75.20	0.15	77.75	0.69	80.30	1.45		
75.25	0.18	77.80	0.69	80.35	1.46		
75.30	0.20	77.85	0.70	80.40	1.47		
75.35	0.22	77.90	0.71	80.45	1.49		
75.40	0.24	77.95	0.71	80.50	1.58		
75.45	0.26	78.00	0.72	80.55	1.86		
75.50	0.28	78.05	0.73	80.60	2.25		
75.55	0.29	78.10	0.73	80.65	2.71		
75.60	0.31	78.15	0.74	80.70	3.25		
75.65	0.32	78.20	0.74	80.75	3.85		
75.70	0.33	78.25	0.75	80.80	4.50		
75.75	0.35	78.30	0.76	80.85	5.20		
75.80	0.36	78.35	0.76	80.90	5.94		
75.85	0.37	78.40	0.77	80.95	6.74		
75.90	0.38	78.45	0.77	81.00	7.57		

Stage-Area-Storage for Pond F-2:

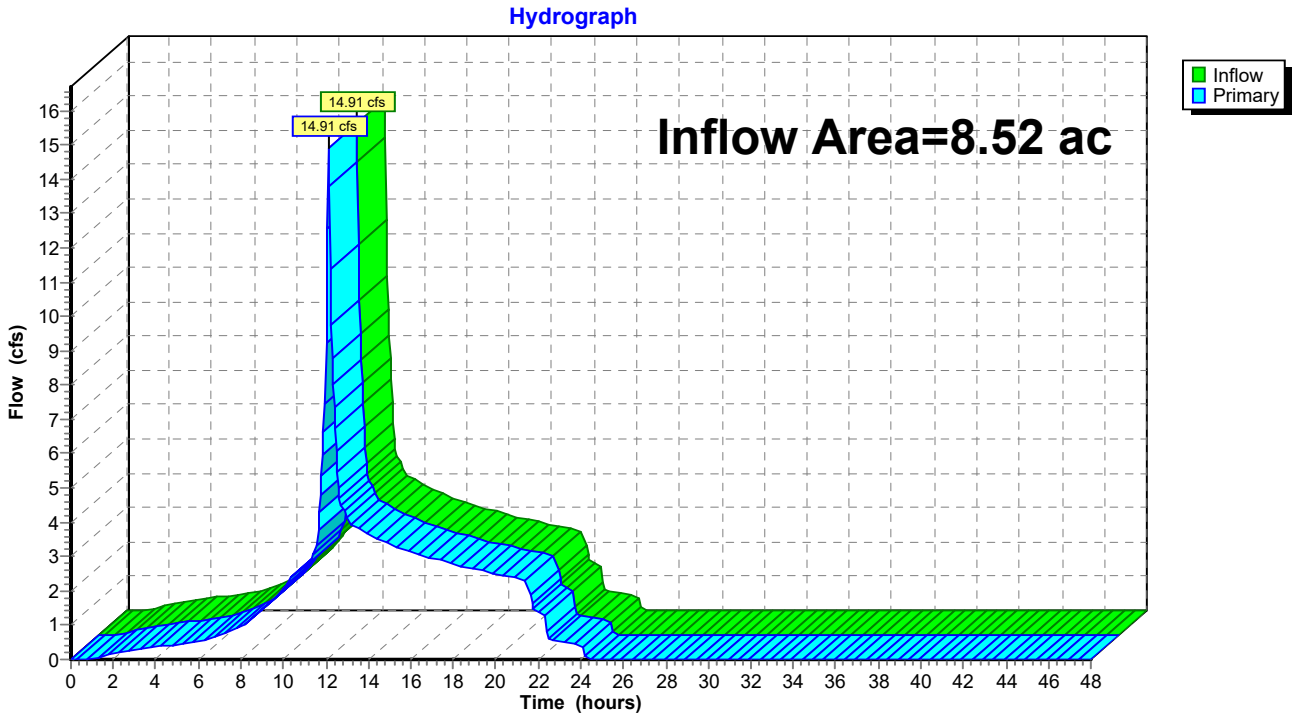
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
73.40	0	78.50	204
73.50	4	78.60	208
73.60	8	78.70	212
73.70	12	78.80	216
73.80	16	78.90	220
73.90	20	79.00	224
74.00	24	79.10	228
74.10	28	79.20	232
74.20	32	79.30	1,997
74.30	36	79.40	4,202
74.40	40	79.50	6,407
74.50	44	79.60	8,612
74.60	48	79.70	10,816
74.70	52	79.80	13,021
74.80	56	79.90	15,226
74.90	60	80.00	17,431
75.00	64	80.10	19,636
75.10	68	80.20	21,841
75.20	72	80.30	24,046
75.30	76	80.40	26,251
75.40	80	80.50	28,456
75.50	84	80.60	30,661
75.60	88	80.70	32,866
75.70	92	80.80	35,335
75.80	96	80.90	37,869
75.90	100	81.00	**40,404**
76.00	104		
76.10	108		
76.20	112		
76.30	116		
76.40	120		
76.50	124		
76.60	128		
76.70	132		
76.80	136		
76.90	140		
77.00	144		
77.10	148		
77.20	152		
77.30	156		
77.40	160		
77.50	164		
77.60	168		
77.70	172		
77.80	176		
77.90	180		
78.00	184		
78.10	188		
78.20	192		
78.30	196		
78.40	200		

Summary for Link DP 1:

Inflow Area = 8.52 ac, 74.02% Impervious, Inflow Depth = 5.51" for 25-Year event
Inflow = 14.91 cfs @ 12.11 hrs, Volume= 170,453 CF
Primary = 14.91 cfs @ 12.11 hrs, Volume= 170,453 CF, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP 1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=7.36"
Tc=6 min CN=98 Runoff=20.99 cfs 77,003 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=7.36"
Tc=6 min CN=98 Runoff=21.20 cfs 77,778 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=5.25"
Flow Length=156' Tc=7 min CN=80 Runoff=15.54 cfs 51,961 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=4.23"
Flow Length=146' Tc=6 min CN=71 Runoff=5.09 cfs 16,075 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=4.57"
Flow Length=232' Tc=7 min CN=74 Runoff=4.71 cfs 15,377 CF

Pond F-1: Peak Elev=80.37' Storage=30,313 cf Inflow=20.99 cfs 77,003 CF
Outflow=2.47 cfs 76,943 CF

Pond F-2: Peak Elev=80.59' Storage=30,481 cf Inflow=21.20 cfs 77,778 CF
Outflow=2.19 cfs 77,718 CF

Link DP 1: Inflow=18.21 cfs 206,621 CF
Primary=18.21 cfs 206,621 CF

Total Runoff Area = 10.49 ac Runoff Volume = 238,193 CF Average Runoff Depth = 6.25"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPRWS-1A: Runoff Area=2.88 ac 100.00% Impervious Runoff Depth=8.86"
Tc=6 min CN=98 Runoff=25.16 cfs 92,686 CF

SubcatchmentPRWS-1B: Runoff Area=2.91 ac 100.00% Impervious Runoff Depth=8.86"
Tc=6 min CN=98 Runoff=25.41 cfs 93,619 CF

SubcatchmentPRWS-1C: Runoff Area=2.73 ac 18.82% Impervious Runoff Depth=6.66"
Flow Length=156' Tc=7 min CN=80 Runoff=19.53 cfs 65,934 CF

SubcatchmentPRWS-2: DP 2 Runoff Area=1.05 ac 0.00% Impervious Runoff Depth=5.55"
Flow Length=146' Tc=6 min CN=71 Runoff=6.65 cfs 21,064 CF

SubcatchmentPRWS-3: DP 3 Runoff Area=0.93 ac 12.62% Impervious Runoff Depth=5.92"
Flow Length=232' Tc=7 min CN=74 Runoff=6.08 cfs 19,922 CF

Pond F-1: Peak Elev=80.59' Storage=35,174 cf Inflow=25.16 cfs 92,686 CF
Outflow=5.06 cfs 92,626 CF

Pond F-2: Peak Elev=80.81' Storage=35,506 cf Inflow=25.41 cfs 93,619 CF
Outflow=4.60 cfs 93,559 CF

Link DP 1: Inflow=22.34 cfs 252,119 CF
Primary=22.34 cfs 252,119 CF

Total Runoff Area = 10.49 ac Runoff Volume = 293,224 CF Average Runoff Depth = 7.70"
38.78% Pervious = 4.07 ac 61.22% Impervious = 6.42 ac

APPENDIX C

Rainfall Data

24-Hour Design Storm Precipitation Amounts

24-Hour Design Storm Frequency	Precipitation Amount (inches)
1 year	2.9
2 year	3.4
5 year	4.3
10 year	5.1
25 year	6.4
50 year	7.6
100 year	9.1
200 year	10.8
500 year	13.5

Source: "Extreme Precipitation in New York & New England: An Interactive Web Tool for Extreme Precipitation Analysis," http://precip.eas.cornell.edu. Accessed 12/20/2011.

NOAA Atlas 14, Volume 10, Version 3
Location name: Greenwich, Connecticut, USA*
Latitude: 41.0112°, Longitude: -73.6483°
Elevation: 79.43 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.40** (3.35-5.69)	**5.14** (3.90-6.65)	**6.34** (4.80-8.22)	**7.33** (5.53-9.56)	**8.71** (6.38-11.7)	**9.76** (7.01-13.3)	**10.8** (7.57-15.1)	**12.0** (8.03-17.0)	**13.6** (8.81-19.8)	**14.9** (9.46-22.0)
10-min	**3.11** (2.37-4.03)	**3.64** (2.77-4.70)	**4.49** (3.40-5.82)	**5.20** (3.92-6.76)	**6.17** (4.52-8.27)	**6.91** (4.97-9.39)	**7.67** (5.37-10.7)	**8.50** (5.69-12.1)	**9.65** (6.25-14.0)	**10.6** (6.70-15.6)
15-min	**2.44** (1.86-3.16)	**2.85** (2.17-3.69)	**3.52** (2.67-4.57)	**4.07** (3.07-5.30)	**4.84** (3.54-6.49)	**5.42** (3.90-7.37)	**6.01** (4.21-8.39)	**6.66** (4.46-9.45)	**7.57** (4.90-11.0)	**8.30** (5.25-12.2)
30-min	**1.70** (1.29-2.20)	**1.99** (1.51-2.57)	**2.46** (1.86-3.19)	**2.85** (2.15-3.71)	**3.38** (2.48-4.53)	**3.79** (2.72-5.14)	**4.21** (2.94-5.85)	**4.65** (3.12-6.59)	**5.26** (3.40-7.64)	**5.73** (3.63-8.46)
60-min	**1.09** (0.830-1.41)	**1.27** (0.969-1.65)	**1.58** (1.20-2.05)	**1.83** (1.38-2.38)	**2.17** (1.59-2.91)	**2.44** (1.75-3.31)	**2.70** (1.89-3.76)	**2.98** (2.00-4.23)	**3.36** (2.17-4.89)	**3.66** (2.31-5.40)
2-hr	**0.720** (0.550-0.925)	**0.841** (0.642-1.08)	**1.04** (0.792-1.34)	**1.20** (0.912-1.56)	**1.43** (1.05-1.90)	**1.60** (1.16-2.16)	**1.78** (1.25-2.46)	**1.97** (1.32-2.77)	**2.22** (1.44-3.20)	**2.42** (1.53-3.54)
3-hr	**0.555** (0.426-0.711)	**0.650** (0.498-0.833)	**0.805** (0.615-1.03)	**0.933** (0.710-1.20)	**1.11** (0.819-1.47)	**1.25** (0.901-1.68)	**1.38** (0.973-1.91)	**1.53** (1.03-2.15)	**1.73** (1.13-2.50)	**1.90** (1.21-2.77)
6-hr	**0.348** (0.268-0.443)	**0.410** (0.316-0.523)	**0.513** (0.394-0.655)	**0.598** (0.456-0.766)	**0.714** (0.530-0.943)	**0.802** (0.584-1.08)	**0.894** (0.633-1.23)	**0.995** (0.672-1.39)	**1.14** (0.742-1.63)	**1.25** (0.799-1.82)
12-hr	**0.209** (0.162-0.264)	**0.249** (0.193-0.316)	**0.315** (0.243-0.400)	**0.370** (0.284-0.472)	**0.446** (0.333-0.587)	**0.503** (0.368-0.672)	**0.563** (0.402-0.773)	**0.631** (0.428-0.875)	**0.730** (0.477-1.04)	**0.811** (0.519-1.17)
24-hr	**0.121** (0.094-0.152)	**0.147** (0.114-0.185)	**0.189** (0.147-0.238)	**0.224** (0.173-0.283)	**0.272** (0.204-0.356)	**0.307** (0.227-0.409)	**0.346** (0.249-0.474)	**0.391** (0.266-0.538)	**0.458** (0.300-0.646)	**0.514** (0.330-0.736)
2-day	**0.068** (0.053-0.085)	**0.084** (0.065-0.105)	**0.109** (0.085-0.137)	**0.130** (0.101-0.163)	**0.159** (0.120-0.207)	**0.180** (0.134-0.239)	**0.203** (0.148-0.279)	**0.231** (0.158-0.317)	**0.274** (0.180-0.385)	**0.311** (0.200-0.442)
3-day	**0.049** (0.039-0.061)	**0.061** (0.047-0.075)	**0.079** (0.062-0.099)	**0.094** (0.073-0.118)	**0.115** (0.087-0.150)	**0.131** (0.097-0.173)	**0.147** (0.107-0.201)	**0.168** (0.115-0.229)	**0.199** (0.131-0.278)	**0.226** (0.145-0.319)
4-day	**0.040** (0.031-0.049)	**0.049** (0.038-0.060)	**0.063** (0.049-0.078)	**0.075** (0.058-0.094)	**0.091** (0.069-0.119)	**0.104** (0.077-0.137)	**0.117** (0.085-0.159)	**0.133** (0.091-0.181)	**0.157** (0.104-0.219)	**0.178** (0.115-0.251)
7-day	**0.027** (0.021-0.033)	**0.032** (0.026-0.040)	**0.041** (0.033-0.051)	**0.049** (0.038-0.061)	**0.059** (0.045-0.076)	**0.066** (0.050-0.087)	**0.075** (0.054-0.100)	**0.084** (0.058-0.114)	**0.098** (0.065-0.136)	**0.111** (0.072-0.155)
10-day	**0.022** (0.017-0.027)	**0.026** (0.020-0.032)	**0.032** (0.025-0.040)	**0.038** (0.030-0.047)	**0.045** (0.034-0.058)	**0.051** (0.038-0.066)	**0.057** (0.041-0.076)	**0.063** (0.044-0.086)	**0.074** (0.049-0.101)	**0.082** (0.053-0.115)
20-day	**0.015** (0.012-0.019)	**0.018** (0.014-0.021)	**0.021** (0.017-0.026)	**0.024** (0.019-0.030)	**0.028** (0.022-0.036)	**0.031** (0.024-0.040)	**0.035** (0.025-0.046)	**0.038** (0.026-0.051)	**0.043** (0.029-0.059)	**0.047** (0.030-0.065)
30-day	**0.013** (0.010-0.015)	**0.014** (0.011-0.017)	**0.017** (0.013-0.021)	**0.019** (0.015-0.023)	**0.022** (0.017-0.028)	**0.024** (0.018-0.031)	**0.027** (0.019-0.035)	**0.029** (0.020-0.038)	**0.032** (0.021-0.044)	**0.034** (0.022-0.047)
45-day	**0.010** (0.008-0.013)	**0.012** (0.009-0.014)	**0.013** (0.011-0.016)	**0.015** (0.012-0.018)	**0.017** (0.013-0.022)	**0.019** (0.014-0.024)	**0.021** (0.015-0.027)	**0.022** (0.015-0.029)	**0.024** (0.016-0.033)	**0.026** (0.017-0.035)
60-day	**0.009** (0.007-0.011)	**0.010** (0.008-0.012)	**0.012** (0.009-0.014)	**0.013** (0.010-0.016)	**0.015** (0.011-0.018)	**0.016** (0.012-0.020)	**0.017** (0.012-0.022)	**0.018** (0.013-0.024)	**0.020** (0.013-0.027)	**0.021** (0.014-0.029)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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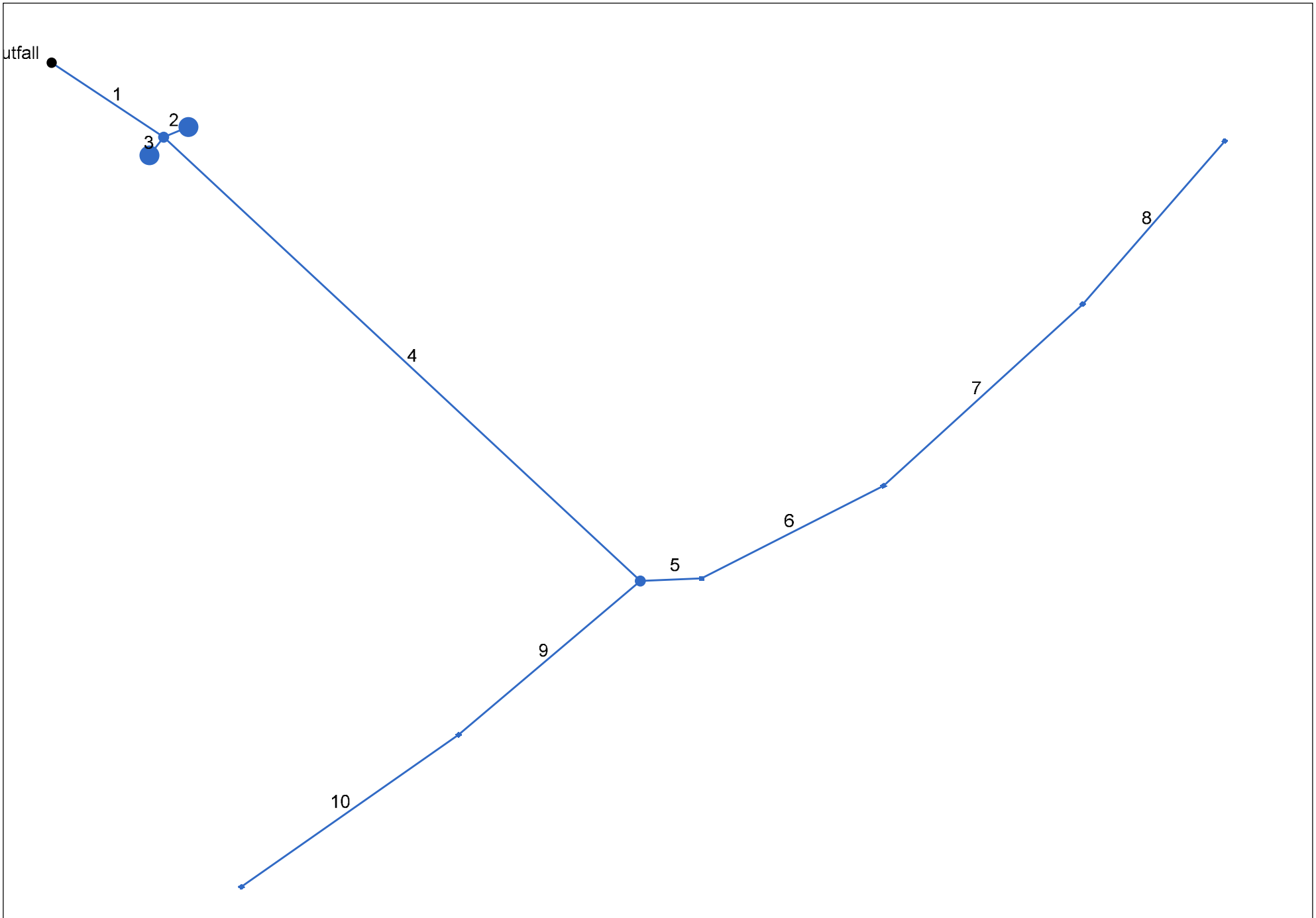
PF graphical

APPENDIX D

Pipe Size Calculations

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 2022-06-09 Proposed Storm.stm	Number of lines: 10	Date: 8/9/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	64.481	0.00	0.54	0.00	0.00	0.47	0.0	11.9	4.9	4.95	61.74	4.76	18	29.45	55.56	74.55	56.42	75.41	58.06	81.28	EXMH-MH100
2	1	12.372	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.37	7.92	2.84	18	0.48	74.88	74.94	75.41	75.38	81.28	81.37	MH100-OCS116
3	1	11.802	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.30	8.11	3.25	18	0.51	75.42	75.48	75.83	75.91	81.28	81.20	MH100-OCS114
4	1	323.478	0.00	0.54	0.00	0.00	0.47	0.0	10.5	5.2	2.44	2.73	3.80	12	0.50	74.55	76.17	75.41	76.86	81.28	81.39	MH100-MH101
5	4	27.248	0.03	0.15	6.00	0.18	0.26	7.5	10.3	5.3	1.38	2.77	1.94	12	0.51	76.22	76.36	77.14	77.16	81.39	81.51	MH101-YD102
6	5	95.697	0.05	0.12	0.76	0.04	0.08	6.0	9.3	5.6	0.46	2.73	1.59	12	0.50	76.36	76.84	77.21	77.12	81.51	81.74	YD102-YD103
7	6	133.503	0.05	0.07	0.60	0.03	0.04	7.5	8.0	6.0	0.26	2.73	1.79	12	0.50	76.83	77.50	77.12	77.71	81.74	81.39	YD103-YD104
8	7	109.991	0.02	0.02	0.71	0.01	0.01	6.5	6.5	6.6	0.09	2.73	1.22	12	0.50	77.50	78.05	77.71	78.17	81.39	81.47	YD104-YD105
9	4	117.102	0.25	0.39	0.49	0.12	0.21	8.5	8.5	5.8	1.19	2.72	3.18	12	0.50	76.63	77.21	77.14	77.67	81.39	79.60	MH101-YD106
10	9	127.720	0.14	0.14	0.60	0.08	0.08	7.5	7.5	6.2	0.52	2.73	2.05	12	0.50	77.21	77.85	77.67	78.15	79.60	79.62	YD106-YD107

Project File: 2022-06-09 Proposed Storm.stm

Number of lines: 10

Run Date: 8/9/2022

NOTES:Intensity = 30.83 / (Inlet time + 3.20) ^ 0.68; Return period =Yrs. 10 ; c = cir e = ellip b = box

APPENDIX E

DCIA Certification

Town of Greenwich
Department of Public Works – Engineering Division
Town Hall – 101 Field Point Road, Greenwich CT 06830
Phone 203-622-7767

DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA) CERTIFICATION PRE-CONSTRUCTION

Property Address: 1 Western Junior Highway Tax Account No.: 057 04-4519/S

Building Permit No.: N/A

PLANS & DRAINAGE SUMMARY REPORT INFORMATION

Engineering Firm: Langan

Design Plans Date: 8/10/2022 Drainage Report Date: 8/11/2022

PROPERTY INFORMATION FOR DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)

Total Impervious Area Under Existing Conditions (SF)[1]	Total Impervious Area Under Proposed Conditions (SF)[1]	Total Disconnected Impervious Area Under Proposed Conditions (SF)[2]	Total Directly Connected Impervious Area Under Proposed Conditions (SF)[3]
21,350.00	279,790.00	252,360.00	27,430.00

[1] Impervious surfaces include but are not limited to roofs (including green roofs), buildings, houses, walks, patios, walls, tennis/sport courts (all surface types must be counted), landscape ponds, pools, paved streets/drives/parking areas constructed with concrete, asphalt, compacted dirt, gravel, or permeable pavements.

[2] All impervious surfaces that are directed to stormwater BMPs that meet the water quality volume (WQV) standard will be considered disconnected impervious cover. Acceptable stormwater BMPs are Bioretention (infiltrating/filtering), Constructed Stormwater Wetlands, Extended Dry Detention Basins (infiltration required), Gravel Wetlands, Constructed Wet Stormwater Ponds, Sand/Organic Filters (sand filters, tree filters, stormwater planters, etc.), Infiltration Systems (drywells, Cultecs, etc.), Permeable Pavement Areas (infiltrating/filtering), Green Roofs, and Disconnected Impervious Area (must meet all the standards under Simple Disconnection on page 44 and 45 of the Drainage Manual).

[3] Subtract the Total Disconnected Impervious Area Under Proposed Conditions (SF) from the Total Impervious Area Under Proposed Conditions (SF).

Engineer's Signature  Date 8/11/2022

Engineer's Seal

APPENDIX F

Supporting Calculations

$$GRV = F \times I \quad (5.3)$$

where: GRV = required Groundwater Recharge Volume (cubic feet or acre-feet)
F = target depth factor associated with each Hydrologic Soil Group[12] (inches) (see *Table 5-2*)
I = impervious area on the post-development site for new development projects or the net increase in impervious area for redevelopment projects

Project	**140148202 - Western Middle School**	Date	**8/11/2022**
Location	**Greenwich, CT**	By	**BTW**

PRWS-1

Soil Type C

Target Depth Factor = 0.25 inches

I = 289,319 SF (proposed) – 10,036 SF (existing) = 279,283 SF

Soil Type D

Target Depth Factor = 0.10 inches

I = 7,946 SF (proposed) – 5,034 SF (existing) = 2,912 SF

GRV = F x I = 279,283 SF x (0.25 in / 12 in/ft) + 2,912 SF x (0.10 in / 12 in/ft)

GRV = 5,843 CF

PRWS-2

I = 0 SF (proposed)

GRV = 0 CF

PRWS-3

I = 4,565 SF (proposed) – 6,970 SF (existing) = –2,405 SF

GRV = 0 CF

Total Groundwater Recharge Volume = 5,843 CF

Project **140148202 - Western Middle School** Date **8/11/2022**

Location **Greenwich, CT** By **BTW**

PRWS-1

1-Year Design Storm Runoff Volume

$V_{existing}$ = 26,925 CF

$V_{proposed}$ = 67,631 CF

RRV = 67,631 SF - 26,925 CF

RRV = 40,706 CF

PRWS-2

1-Year Design Storm Runoff Volume

$V_{existing}$ = 7,883 CF

$V_{proposed}$ = 2,671 CF

RRV = 7,883 CF - 2,671 CF

RRV = -5,212 CF

PRWS-3

1-Year Design Storm Runoff Volume

$V_{existing}$ = 6,913 CF

$V_{proposed}$ = 2,845 CF

RRV = 6,913 CF - 2,845 CF

RRV = -4,068 CF

Total Runoff Reduction Volume = 31,426 CF

$$WQV = \frac{(1")(R)(A)}{12} \qquad (5.1)$$

where:
WQV = water quality volume (acre-feet)
R = site cover runoff coefficient = $RvI * \%I + RvT * \%T + RvF * \%F$
RvI = runoff coefficient for impervious cover (see *Table 5-5*)
RvT = runoff coefficient for lawn or managed turf (see *Table 5-5*)
RvF = runoff coefficient for forested cover and open space (see *Table 5-5)*
$\%I$ = percent of site in impervious cover (fraction)
$\%T$ = percent of site in lawn or managed turf (fraction)
$\%F$ = percent of site in forested cover and open space (fraction)
A = site area (acres)

Project	**140148202 - Western Middle School**	Date	**8/11/2022**
Location	**Greenwich, CT**	By	**BTW**

PRWS-1

Impervious Area = 274,689 SF
Lawn/Turf Area (HSG C) = 62,649 SF
Forest Area (HSG C) = 2,134 SF
Lawn/Turf Area (HSG D) = 31,624 SF

R = 274,689 SF x 0.95 + 62,639 SF x 0.22 + 2,134 SF x 0.04 + 31,624 SF x 0.25 = 0.76
A = 371,086 SF
WQV = 1 in x 0.76 x 371,086 SF / 12

WQV = 23,502 CF

PRWS-2

Lawn/Turf Area (HSG C) = 39,030 SF
Forest Area (HSG C) = 6,534 SF

R = 39,030 SF x 0.22 + 6,534 SF x 0.04 = 0.19
A = 45,564 SF
WQV = 1 in x 0.19 x 45,564 SF / 12

WQV = 721 CF

PRWS-3

Impervious Area = 5,097 SF
Lawn/Turf Area (HSG C) = 25,483 SF
Forest Area (HSG C) = 9,104 SF
Lawn/Turf Area (HSG D) = 523 SF
Forest Area (HSG D) = 174 SF

R = 5,097 SF x 0.95 + 25,483 SF x 0.22 + 9,104 SF x 0.04 + 523 SF x 0.25
+ 174 SF x 0.05 = 0.27
A = 40,381 SF
WQV = 1 in x 0.27 x 40,381 SF / 12

WQV = 909 CF

Total Water Quality Volume = 25,132 CF

$$Time_{drawdown} = \frac{GRV}{(K)(Bottom\ Area)} \qquad (B.3)$$

where: GRV = required Groundwater Recharge Volume (cu ft or acre-feet) or equivalent design volume
K = Field infiltration rate

Project	**140148202 - Western Middle School**	Date	**8/11/2022**
Location	**Greenwich, CT**	By	**BTW**

Infiltration Basin

GRV = 65,050 CF
K = 0.27 in/hr
Bottom Area = 43,367 SF
Drawdown Time = 65,050 CF / ((0.27 in/hr / 12 in/ft) x 43,367 SF)

Drawdown Time = 66.7 hours

INSTRUCTIONS:
1. Column A and B: See TSS removal efficiency table in Section 5 of the Greenwich Drainage Manual
2. Complete only highlighted cells

TSS Removal Calculation Worksheet

Location: Synthetic Turf Athletic Fields

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Infiltration Basin	**90%**	**1.00**	**0.90**	**0.10**
		0.10	**0.00**	**0.10**
		0.10	**0.00**	**0.10**
		0.10	**0.00**	**0.10**
		0.10	**0.00**	**0.10**

Project:

Prepared By: **Langan Engineering**

Date: **8/11/2022**

Total TSS Removal = **90%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

*Equals remaining load from previous BMP (E) which enters the BMP

APPENDIX G

Operation and Maintenance

Operation & Maintenance Manual
Western Middle School Proposed Athletic Fields

Regular inspection and maintenance of the stormwater management system and uphill areas is necessary to ensure proper operation. Inspections of the stormwater management system and pavement areas should be conducted monthly based on the following table:

Site Areas:

Inspection and Maintenance

Check for:	***Corrective Measure:***
Erosion	Install erosion control measures and provide stabilization measures
Spillage	Contain spill as close to source as possible with a dike of absorbent materials installed to protect drainage inlets, stormwater areas, or downstream wetlands and streams. All hazardous waste material, including absorbent materials must be disposed of by a licensed hazardous waste transporter and disposed of in an environmentally acceptable manner
Sediment Accumulation	Stabilize any disturbed areas uphill of where the sedimentation is occurring. Use temporary erosion control measures (i.e. silt fence, straw bales) to filter stormwater runoff.
Trash	Pick up and dispose of trash and litter in an environmentally acceptable manner.

At a minimum the following maintenance measures shall be provided at the frequency listed in the following table:

Routine Maintenance

Maintenance Measure:	***Frequency:***
Pavement Sweeping	Minimum two times per year: during spring cleanup (after last snow event) and during fall cleanup (to remove fallen leaves)
Pavement De-icing	Apply anti-icing treatment prior to storms Apply deicing treatments as needed during and after snow storms and mixed precipitation events to control ice and compact snow not removed during plowing

Catch Basins and Pipe:

Inspection and Maintenance

Check for:	***Corrective Measure:***
Trash, Sediment, and Debris at Grate	Remove trash, sediment, and debris and dispose of in an environmentally acceptable manner.
Sediment & Trash Accumulation in Sump	Remove sediment from sumps if depth of deposits is greater than one-half the depth from the bottom of the catch basin to the invert of the lowest pipe in the basin.
Pipe blockages	Flush pipes to remove blockages. TV inspect as required.

At a minimum the following maintenance measures shall be provided at the frequency listed in the following table:

Routine Maintenance

Maintenance Measure:	***Frequency:***
Sediment Removal	Minimum one time per year: Remove sediment and trash from catch basin sumps and grates and pipe inverts. Dispose of sediment and trash in an environmentally acceptable manner.

Maintenance measures for the water quality unit shall be referred to the attached CDS Inspection and Maintenance Guide below.

STORMWATER MANAGEMENT SYSTEM INSPECTION AND MAINTENANCE CHECKLIST

South End Waterfront Date: Date Since Last Precipitation Event:	Time:	Inspector: Site Conditions:

Inspection Item	**Satisfactory? Yes (Y) or No (N)**		**Comments or Corrective Measures Taken**
Site Areas			
Erosion	Y	N	
Spillage	Y	N	
Sediment Accumulation	Y	N	
Trash	Y	N	
Catch Basins and Pipe			
Trash, Sediment, and Debris at Inlet Grates	Y	N	
Sediment & Trash Accumulation in Sump	Y	N	
Pipe blockages	Y	N	