South High Community School

170 Apricot Street, Worcester, MA 01603

Final Bid Package

Volume II of IV – Appendix

January 31, 2019

MSBA
Massachusetts School Building Authority
40 Broad Street, Suite 500, Boston, MA 02111

OWNER
City of Worcester, MA
City Hall, 455 Main Street, Worcester, MA 01608

OPM
Heery International
80 Blanchard Road, Suite 108, Burlington, MA 01803

DESIGNER
Lamoureux Pagano & Associates, Inc.
108 Grove Street, Suite 300, Worcester, MA 01605

Prepared by:

LAMOUREUX · PAGANO
ARCHITECTS PROJECT MANAGERS

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APPENDIX A

PRELIMINARY GEOTECHNICAL REPORT

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LGCI
Lahlaf Geotechnical Consulting, Inc.

April 9, 2018

Mr. Eric Moore, AIA
Lamoureux Pagano & Associates, Inc.
108 Grove Street, Suite 300
Worcester, MA 01605
Tel: (508) 752-2831
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Re: Geotechnical Report
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Dear Mr. Moore:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed subsurface explorations at the site of the proposed Worcester South High School in Worcester, Massachusetts. This report contains the results of our subsurface explorations and our foundation design and construction recommendations. We are submitting our report electronically. Please notify us if you require a hard copy.

The soil samples and rock cores from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples and rock cores after three months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

GEOTECHNICAL REPORT
PROPOSED WORCESTER SOUTH HIGH SCHOOL
WORCESTER, MASSACHUSETTS

LGCI Project No. 1644
April 9, 2018

Prepared for:

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GEOTECHNICAL REPORT
PROPOSED WORCESTER SOUTH HIGH SCHOOL
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Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This report presents the results of three (3) phases of geotechnical services performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed Worcester South High School in Worcester, Massachusetts.

The first phase of our services included a review of the available information at the site and was part of a feasibility study. It was performed in general accordance with our proposal No. 16110 dated November 17, 2016. Mr. Michael Pagano of Lamoureux Pagano & Associates, Inc. (LPA) authorized our services by signing our proposal on November 22, 2016.

The second phase of our services was part of the Schematic Design (SD Phase). It included performing preliminary explorations at the site and was performed in general accordance with our proposal No. 17098 dated July 21, 2017. Mr. Michael A. Pagano of LPA authorized our services by signing our proposal on July 25, 2017.

The third phase of our services was part of the Design Development (DD Phase) and included performing additional explorations at the site. The DD Phase services were performed in general accordance with our proposal No. 17165-Rev.1 revised January 30, 2018. Our services for the latter proposal were verbally approved by LPA.

1.2 Purpose and Scope of Services

The purpose of this study was to obtain additional subsurface information at the site and to provide recommendations for foundation design and construction. This report includes the results from all three of our studies at the site and supersedes the previous preliminary geotechnical report dated September 25, 2017.

To date, LGCI has performed the following services:

- Reviewed the existing information about the site.

- Coordinated our field explorations for the SD Phase with LPA and with the Worcester South High School staff. We coordinated our DD Phase services with LPA, Fontaine Bros., Inc., Heery International, Lord Associates, Nitsch Engineering, Inc., City of Worcester water Department staff, and the Worcester South High School staff.

- Marked the exploration locations at the site and notified Dig Safe Systems Inc. (Dig Safe) and the City of Worcester DPW. We also coordinated with a private utility clearance company who was engaged directly by the City to clear our exploration locations for electric lines during the DD Phase explorations.

- Engaged an excavation subcontractor to excavate fourteen (14) test pits during the SD Phase and twenty-six (26) test pits during the DD Phase. Our excavation subcontractor also performed tree clearing during the DD Phase to provide access to the test pit and soil boring locations.

- Engaged a drilling subcontractor to advance eight (8) soil borings during the SD Phase and thirty (30) soil borings during the DD Phase.

- Performed five (5) double-ring infiltrometer tests in five (5) test pits (one each) at locations selected by Nitsch Engineering, Inc. (Nitsch) during the DD Phase.

- Installed five (5) groundwater observation wells in five (5) borings (one each) in the DD Phase.

- Provided a geotechnical field engineer at the site to coordinate and observe the borings and test pits, describe the soil samples, and prepare field logs.

- Submitted four (4) soil samples during the SD Phase and thirteen (13) soil samples during the DD Phase for grain-size analyses.

- Prepared this geotechnical report containing the results of our subsurface explorations and our recommendations for foundation design and construction.

Our scope also includes attending meetings, reviewing foundation drawings, preparing earth moving specifications, performing contract document review, slope stability analyses, and providing construction services. Our slope stability analyses will be performed after the proposed wall on the southern side of the site is designed.

LGCI did not perform environmental services for this project. LGCI did not perform an assessment to evaluate the presence or absence of hazardous or toxic materials above or below the ground surface at or around the site. Any statement about the color, odor, or the presence of suspicious materials included in our boring and test pit logs or report were made by LGCI for information only and to support our geotechnical services. No environmental recommendations and/or opinions are included in this report.

Recommendations for stormwater management, erosion control, pavement design, and detailed cost or quantity estimates are not included in our scope of work.

1.3 Site Description

Our understanding of the existing conditions is based on our field observations, our discussions with LPA, and on the following drawings:

- "South High Community School, Existing Structural Conditions -DRAFT," (Structural Report) dated November 18, 2016 and provided to LGCI by LPA via e-mail on December 5, 2016.

- Logs of previous soil borings and test pits advanced at the site of the existing high school and provided to LGCI by LPA via e-mail on November 8, 2016.

- Drawings L1 and L2 titled: "Site Layout, Southwest High School, Worcester, Mass," (Existing School Layout Plan) prepared by CW Buckley Architects, Inc. and dated May 17, 1976.

- Drawings L3 and L4 titled: "Site Grading, Southwest High School, Worcester, Mass," (Former Grading Plan) prepared by CW Buckley Architects, Inc. and dated May 17, 1976.

- Drawings S1 to S4 titled: "Foundation Plans, Southwest High School, Worcester, Mass," (Existing School Foundation Plans) prepared by CW Buckley Architects, Inc. and dated May 17, 1976.

- Drawings EX2.0 to EX2.4 titled: "Existing Conditions Plan, South High Community School, Worcester, Massachusetts," (Proposed Grading Plan), dated May 11, 2018 and downloaded by LGCI from LPA's ftp site on April 6, 2018.

The existing high school is located at 170 Apricot Street in Worcester, Massachusetts as shown in Figures 1, and 2. The site is bordered by Apricot Street on the southern side, by wooded land and private properties on the western side, by wooded land and wetlands on the northern side, and by the Arthur F. Sullivan Middle School on the eastern side.

The existing high school consists of a building with a nearly square shape. The building has a basement (Level 1) on the eastern side with a finished floor elevation (FFE) at El. 769 feet. The western portion of the building (Level 2) has a finished floor elevation of El. 785 feet.

A driveway and a narrow strip of parking spaces loops around the southern, western, northern, and part of the eastern sides of the school. Additional parking is available east and downhill of the school building.

Two athletic fields are located on the northern side and northwestern side of the school building. The field on the northwestern side of the existing school is a practice field. The field on the northern side of the existing school building is the larger of the two fields and includes a track.

The Existing Conditions Plan indicates that the existing grades around the existing school range between El. 768 feet near the northwestern corner and El. 785 feet near the southeastern corner. The grades within the existing track range between about El. 765 feet and El. 767 feet, and the grades in the athletic field, northwest of the existing building, range between about El. 766 feet and El. 769 feet. The grades in the lower parking lot range between about El. 735 feet and El. 751 feet.

Based on the Former Grading Plan, the grades before the construction of the existing school were as follows:

- Level 1: between El. 769 feet and El. 785 feet, i.e., required cuts up to 16 feet to reach FFE of El. 769 feet.

- Level 2: between El. 771 feet and El. 787 feet, i.e., required cuts of up to 2 feet and up to 14 feet of fill, including fill of up to 13 feet within the existing pool area to reach FFE of El. 785 feet.

- Field on the northwestern side of existing school building: between El. 760 feet on the western side and about El. 772 feet near the central and eastern sides, i.e., cuts of about 5 feet and fill of up to 7 feet were required to achieve the existing grades.

- Track: between El. 755 feet and El. 770 feet with a local high at about El. 775 feet, and local low at about El. 750 feet, i.e., cuts of about 5 feet near the center of the field and up to 11 feet of fill on the eastern side to reach the existing grades.

- The Existing School Layout Plan indicates that stockpiles of boulders and topsoil were created during the cuts and fills performed during the construction of the existing school. These boulder and topsoil disposal areas are scattered throughout the site in landscaped areas, including near the northern end of the northern field. It is not known whether these stockpiles were buried in place or removed from the site.

Based on our review of the Existing School Foundation Plans, the existing building is founded on shallow spread and continuous footings. The foundations of Level 2 appear to be bearing in the fill.

1.4 Project Description

Our understanding of the proposed construction is based on our discussions with LPA, and on the following drawings:

- Drawing EC5.0 titled: “Site Grading Plan, South High Community School, Notice of Intent Submission,” (NOI Site Grading Plan) prepared by LPA and dated March 21, 2018.

- Drawings C7.0 to C7.4 (5 sheets) titled: “Site Grading Plan, South High Community School, Worcester, Massachusetts,” (Proposed Grading Plan), dated May 11, 2018 and downloaded by LGCI from LPA’s ftp site on April 6, 2018.

- Drawing S3.1 titled: "Ground Floor Foundation Plan, Section B1, South High Community School," prepared by LPA, dated May 11, 2018 and downloaded by LGCI from LPA's ftp site on April 6, 2018.

- Drawing S3.2 titled: "Ground Floor Foundation Plan, Section B2, South High Community School," prepared by LPA, dated May 11, 2018 and downloaded by LGCI from LPA's ftp site on April 6, 2018.

- Drawing S3.3 titled: "First Floor Foundation Plan, Section A, South High Community School," prepared by LPA, dated May 11, 2018 and downloaded by LGCI from LPA's ftp site on April 6, 2018.

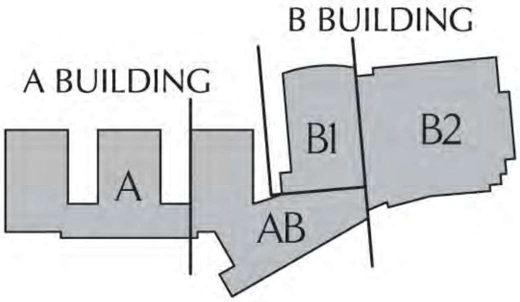
- Drawing S3.4 titled: "First Floor Foundation Plan, Section AB, South High Community School," prepared by LPA, dated May 11, 2018 and downloaded by LGCI from LPA's ftp site on April 6, 2018.

Based the Proposed Grading Plan, the proposed construction will consist of a new school building that will be located north of the existing school building. The proposed construction will include paved driveways and parking area, and athletic fields. The proposed driveway on the southern side of the site will require the construction of a southern retaining wall. Other retaining walls will be required at the site to achieve the proposed grades. A description of the proposed building, southern retaining wall, and proposed paved areas and athletic fields is provided below.

1.4.1 Proposed Building

The proposed building will extend across the existing track and the lower parking lot northeast of the existing building.

Based on the foundation plans S3.1 to S3.4, the proposed building will consist of three portions labeled A Building, AB Building, and B1 and B2 Building. A key plan showing the different portions of the proposed building is shown below.



The proposed building's ground floors will generally match the topography of the site. Accordingly, the proposed building will have a lower at-grade level, referred to as the Ground Floor, that will be located mostly in the existing lower parking lot; and an upper at-grade floor, referred to as the First Floor, that will be mostly located in the existing track. Based on foundation plans S3.1 to S3.4, the proposed building will have finished floor elevations (FFEs) as follows:

- B1 Building: El. 750 feet
- B2 Building: El. 746 feet in the central portion, and El. 750 feet on the northern and southern sides
- AB Building: El. 768 feet
- A Building: El. 768 feet

Based on these grades and on the Proposed Grading Plan, little fill will be required for the First Floor (A and AB Buildings), while fill of up to 9 feet will be required on the northern side of the Ground Floor (B1 and B2 Buildings). Cuts of up to 26 feet will be required on the southern side of the B1 and B2 Buildings.

The southern perimeter wall of the B1 and B2 Buildings will be designed as a retaining wall. Based on the Proposed Grading Plan, the finished grade at the exterior of this wall will be about El. 767, i.e., the proposed wall will have an exposed height of about 17 feet. The construction of this wall will require a support of excavation (SOE) system. We understand that at this time, the type of the SOE system has not been selected. SOE systems being considered include a soldier pile and lagging wall and a soil nail wall. The wall at the transition between the AB Building and the B1 and B2 Building will also be designed as a retaining wall.

The proposed column loads were not available at the time of this report.

1.4.2 Southern Retaining Wall

The Proposed Grading Plan shows large cuts on the southern side of the site to allow for the construction of the proposed access road on the southern side of the site. The proposed wall will separate the site from the wooded land on the southern side of the site and will be about 600 feet long. The ground on the upper side of the proposed wall will slope upward from the top of the wall to higher elevations. Based on the grades shown in the NOI Site Grading Plan, the proposed grades on the lower side of the proposed wall will range between El. 783 feet and El. 771 feet. The grades on the upper side of the proposed wall will range between El. 800 feet and 780 feet. The proposed wall will have an exposed height that will range between about 10 and 17 feet.

At this time, the type of wall has not been selected. We understand that a mechanically stabilized earth (MSE) wall has been ruled out because of the wide extent of excavation needed to install the reinforcing geogrid. We understand that a gravity modular block wall and possibly a soil nail wall are being considered.

1.4.3 Parking Lots, Driveways, and Athletic Fields

The proposed construction will include an access road, paved parking area, and athletic fields. The proposed access road will start in the parking lot near the northeastern corner of the proposed building on the northern side of the site. It will extend in a westerly direction and will loop around the proposed AB and B Buildings before it continues south and east to Apricot Street. The grade of the proposed access road ranges between El. 742 feet near the northeastern corner of the proposed building to about El. 767 feet just west of the proposed AB Building and rises to El. 797 feet near Apricot Street. The construction of the proposed access road will require up to 14 feet of fill on the northern side and up to 19-foot cuts on the southern side of the site. The proposed access road will require a retaining wall separating the site from the Conservation Restriction Area located north of the site. This wall will have an exposed height that will range up to about 16 feet. We understand that this wall will be an MSE wall.

A walkway is proposed connecting the access road to the northern side of the proposed B1 Building. Two terraced retaining walls will be required on the northern side of the proposed walkway near the proposed building. These walls will have exposed heights ranging up to 7 feet.

Another site retaining wall will be required near the southwestern corner of the proposed B2 Building. It will extend from the southwestern corner of the building in an easterly direction, lining the stairs leading to the lower parking lot. This wall will have an exposed height ranging up to 19 feet.

The proposed construction includes a paved parking lot on the southern side of the proposed A and AB Buildings and will have finished grades ranging between El. 767 feet and El. 770 feet. This parking lot will be partially constructed within the footprint of the existing building after the latter is demolished. Construction of this parking area will require little cuts and fill. Additional parking will be provided along widened areas of the proposed access road.

A football field with stands and a practice field are proposed south of the proposed building. Both fields will be constructed within the footprint of the existing building after the latter is demolished. We understand that the proposed fields will have finished grades that will range between El. 774 feet and EL. 775 feet. The athletic fields will require fills up to 5 feet on the western side and cuts of up to 13 feet on the eastern side. A retaining wall will be required on the southern side of the proposed practice field and will have an exposed height of 5.5 feet.

A small building that will house bathrooms will be constructed just south of the track.

1.5 Elevation Data

The Former Grading Plan and the 2017 Progress Survey Plan do not include a reference for the elevation datum. We believe that the Proposed Grading Plan may be referenced to the National American Vertical Datum of 1988 (NAVD 88). Since the elevations in the Former Grading Plan are somewhat similar to those in the 2017 Progress Survey Plan, we believe that the Former Grading Plan may be referenced to the City of Worcester Datum which is 0.16 feet lower than the NAVD 88, i.e., NAVD 88 = Worcester Datum + 0.16 feet.

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed the following surficial geological map: "Surficial Geologic Map of the Worcester South Quadrangle, Massachusetts," prepared by Stone, B.D., Stone, J.R., and DiGiacomo-Cohen, M.L., U.S. Geological Survey, Open-File Report 2006-1260-D (2008).

The surficial geologic map indicates that the natural soils at the site are mostly thin glacial till deposits consisting of a non-sorted, non-stratified matrix of sand, some silt, and little clay, containing scattered gravel clasts and a few large boulders. The surficial geologic map of the site is shown in Figure 3.

2.2 Previous Explorations

LPA provided us with the logs of six (6) soil borings (T-1 to T-5 and T-1A) and thirteen (13) test pits (B-1 to B-13) performed at the site before the construction of the existing high school. The borings indicated 6 inches to 2 feet of topsoil/subsoil overlying very dense fine sand with silt and gravel. The sand layer contained cobbles and boulders. Refusal was encountered in the borings at depths ranging between 13 and 31 feet beneath the original ground surface.

The test pits extended to depths ranging between 7 and 14 feet beneath the ground surface. The test pits indicated 6 inches to 3 feet of topsoil/subsoil overlying fine sand and gravel with stones and boulders. The test pits terminated in the sand layer, except for one test pit that terminated after refusal was encountered on large boulders. The soils encountered in the previous borings and test pits are consistent with the glacial till described in Section 2.1.

The boring and test pit locations, and the logs of the previous borings and test pits are included in Appendix A.

2.3 LGCI's Explorations

2.3.1 General

LGCI performed our subsurface explorations in two (2) phases: the Schematic Design (SD) Phase, and the Design Development (DD) Phase. During the SD Phase, we marked our explorations locations in the field in the presence of a representative of the school. During the DD Phase, an LGCI representative accompanied a representative of Nitsch, who staked the exploration locations. LGCI relocated a few explorations to locations that were accessible with the excavation and/or the drilling equipment with little tree clearing. During both phases, LGCI notified Dig Safe and the City of Worcester to assist with utility clearance. In addition, the City of Worcester engaged a private utility locator during the DD Phase explorations to clear the electric utilities at our exploration locations.

2.3.2 Soil Borings

During the SD Phase, LGCI engaged Northern Drill Service, Inc. (NDS) of Northborough, Massachusetts to advance eight (8) soil borings (B-1 to B-8) at the site on August 10 and 11, 2017. During the DD Phase, LGCI engaged NDS to advance thirty (30) soil borings (B-101 to B-131) at the site between February 13, 2018 and March 1, 2018. One out of the thirty-one soil borings, boring B-126, was not performed due to difficult access. As part the DD Phase, five (5) groundwater observation wells were installed in the soil borings B-103-0W, B-110-OW, B-118B-OW, B-123-OW, and B-128-OW. The borings extended to depths ranging between 10 and 41 feet beneath the ground surface.

An LGCI engineer observed and logged the borings in the field. The borings were advanced with a Mobile B-48 ATV-mounted drill rig using 4-inch cased wash boring techniques and 3 ¼-inch-ID hollow stem augers.

The drillers performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer semi-continuously or at five-foot intervals as noted on the boring logs in general accordance with ASTM D-1586. Unless notified otherwise, we will dispose of the soil samples after three months.

Upon completion, the boreholes were backfilled with the soil cuttings.

Appendix B contains LGCI’s boring logs, and Figures 4A and 4B show the boring locations. Table 1A contains a summary of the borings.

The ground surface elevations shown in the boring logs were provided in a drawing titled: “Boring Location Plan, South High Community School, Worcester, Massachusetts,” provided to LGCI by Nitsch Engineering, Inc. on February 12, 2018 and updated on March 28, 2018.

2.3.3 Test Pits

During the SD Phase, LGCI engaged NDS to excavate fourteen (14) test pits (TP-1 to TP-14) at the site on August 14 and 15, 2017. During the DD Phase, LGCI engaged NDS to excavate twenty-six (26) test pits (TP-101-IT to TP-128) at the site between February 12 and 26, 2018. Two (2) test pits (TP-116 and TP-123) were not excavated due to conflict with water lines. The test pits extended to depths ranging between 8 and 14 feet beneath the ground surface.

As part of the DD Phase, five (5) infiltrometer tests were performed at depths of 3 to 4 feet below ground surface in test pits TP-101-IT, TP-105-IT, TP-115-IT, TP-118-IT, and TP-121-IT.

An LGCI engineer observed and logged the test pits in the field. The test pits were excavated with a Komatsu PC-120 excavator. Upon completion, the test pits were backfilled with the excavated materials which were placed and tamped with the excavator bucket in 1- to 2-foot lifts.

Appendix C contains LGCI's test pit logs, Table 1B contains the test pit summary table, and Figures 4A and 4B show the test pit locations.

The ground surface elevations shown in the test pit logs were provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. on February 12, 2018 and updated March 28, 2018.

2.4 Subsurface Conditions

The subsurface description in this report is based on a limited number of borings and test pits and is intended to highlight the major soil strata encountered during our borings and test pits. The subsurface conditions are known only at the actual boring and test pit locations. Variations may occur and should be expected between boring and test pit locations. Boring and test pit logs represent conditions that we observed at the time of our borings and test pits and are edited based on the results of the laboratory test data as appropriate. The strata boundaries shown in our boring and test pit logs are based on our interpretations and the actual transition may be gradual. Graphic soil symbols are for illustration only.

The subsurface description is broken into three (3) sections: borings and test pits for the proposed building, borings and test pits for the proposed retaining wall on the southern side of the site, and borings and test pits for the proposed parking lots, driveways, and athletic fields. Below are the individual descriptions of the subsurface conditions for each section.

2.4.1 Proposed Building

The first section describes the subsurface conditions encountered in the borings and test pits performed within or near the proposed building footprint, including borings B-1 to B-6, B-101 to B-114, B-116 to B-119A, and B-131, and test pits TP-1 to TP-9, TP-14, TP-101-IT to TP-107, and TP-109 to TP-113. The building borings extended to depths ranging between 10 and 41 feet, and the test pits extended to depths ranging between 8 and 14 feet beneath the ground surface. Summaries of the borings and test pits for the proposed building are shown in Tables 2A and Table 2B.

The soil strata encountered in the borings and test pits were as follows, starting at the ground surface:

Asphalt – Asphalt was encountered at the ground surface in borings B-1, B-108, B-109, B-111, B-112, B-114, B-116, and B-131. Asphalt was not encountered at the ground surface in the test pits. The thickness of the asphalt ranged between 2 to 6 inches.

Topsoil/Subsoil – A layer of surficial organic soil was encountered in borings B-2 to B-6, B-101 to B-107, B-110-OW, B-113, and B-117B to B-119A and in all the test pits. The topsoil extended to depths ranging between 0.4 to 4 feet beneath the ground surface. Subsoil, typically described as silty sand and less frequently as poorly graded sand with silt, was encountered below the topsoil in borings B-2, B-4, B-6, B-101 to B-104, and B-107 and in test pits TP-4, TP-5, and TP-7 to TP-9. The subsoil extended to depths ranging between 2 to 6 feet beneath the ground surface. The percentage of fines ranged between 10 to 25 percent. Traces of organic fines and roots were observed in the subsoil.

Fill – A layer of fill was encountered in all test pits and borings advanced within the proposed building footprint, beneath the asphalt or beneath the topsoil/subsoil, except in borings B-2, B-101 to B-104, and B-107 and test pits TP-1, TP-4, TP-7, and TP-8. The fill extended to depths ranging between 1 and 12 feet beneath the ground surface. The fill consisted mostly of silty sand and occasionally as poorly graded sand, well graded sand, or silty gravel. The fines content in the fill generally ranged between 5 to 35 percent. One sample of fill contained 45 to 50 percent fines.

The fill contained traces of organics, roots, and wood. One sample of fill contained traces of asphalt and rebar. The fill also contained up to 5 percent boulders up to 2 feet in diameter. The fill encountered in the explorations performed within the proposed A and AB Buildings did not contain wood and contained only traces of organics in a few explorations performed within the proposed A Building. A few explorations performed within the proposed B1 and B2 Buildings contained wood and organics.

The standard penetration test (SPT) N-values ranged between 3 and 69 blows per foot (bpf), with most SPT N-values between 3 and 30 indicating mostly very loose to medium dense material. The high SPT N-values may be caused by cobbles and boulders in the fill and may not represent the true density of the fill.

Buried Organics – A layer of buried organic soil was observed below the fill in borings B-1, B-5, and B-111 and in test pits TP-6, TP-111, and TP-113. The layer of buried organic soil extended to depths ranging between 4.7 to 12 feet beneath the ground surface. The buried organics typically consisted of silty sand with traces of organic fines, roots, and wood.

Sand – A layer of sand was encountered beneath the topsoil/subsoil, fill, or buried organic soil and extended to the termination depths of the borings and test pits. The sand was mostly described as silty sand and less frequently as poorly graded sand with silt, or well graded sand with silt. The percentage of fines in the sand ranged up to 40 percent. The percentage of gravel ranged between traces of gravel up to approximately 25 percent. The sand contained up to 5 percent boulders up to 3 feet in diameter.

The SPT N-values in the sand layer ranged between 15 and more than 100 bpf, indicating medium dense to very dense sand.

2.4.2 Southern Retaining Wall

This section describes the subsurface conditions encountered in the borings and test pits advanced along or near the alignment of the proposed retaining wall on the southern side of the site, including borings B-125, and B-127 to B-130, and test pits TP-119, TP-124, and TP-125. The southern retaining wall borings extended to depths ranging between 17 and 31 feet, and the test pits extended to depths ranging between 12 and 12.5 feet beneath the ground surface. Summaries of the borings and test pits performed for the proposed southern retaining wall are shown in Tables 3A and Table 3B.

The soil strata encountered in the borings and test pits were as follows, starting at the ground surface:

<u>Asphalt</u> – A 4-inch layer of asphalt was encountered at the ground surface in boring B-125.

<u>Topsoil/Subsoil</u> – A layer of surficial organic soil was encountered at the ground surface, and in all the test pits. The thickness of the topsoil ranged between 1 to 4 feet beneath the ground surface. Subsoil was encountered below the topsoil in borings B-128-OW to B-130 and extended to depths ranging between 4 to 8 feet below ground surface. The subsoil was described mostly as silty sand and less frequently as poorly graded sand with silt or well graded sand with silt. The percentage of fines ranged up to 30 percent. Traces of organic fines and roots were observed in the subsoil.

<u>Fill</u> – A layer of fill was encountered beneath the asphalt in boring B-125 and beneath the topsoil in test pits TP-119 and TP-124. The fill extended to depths ranging between 3 and 7 feet beneath the ground surface. The fill consisted of silty sand with up to 30 percent fines and up to 35 percent gravel. The fill contained traces of organics and roots. The fill in test pit TP-124 contained traces of brick and wood. The fill also contained between 5 to 10 percent cobbles up to 8 inches in diameter and up to 5 percent boulders up to 2 feet in diameter.

<u>Sand</u> – A layer of sand was encountered beneath the topsoil/subsoil or fill and extended to the boring and test pits termination depths. The sand was mostly described as silty sand and less frequently as poorly graded sand with silt or well graded sand. The percentage of fines in the sand ranged up to 40 percent with most samples containing between 15 to 40 percent fines. The percentage of gravel ranged between traces of gravel up to approximately 25 percent. In test pit TP-119, the sand layer contained between 5 to 10 percent cobbles up to 6

inches in diameter. The sand in test pit TP-125 contained up to 5 percent boulders up to 1.5 feet in diameter.

The SPT N-values in the sand layer ranged between 14 and 100 bpf, with most SPT N-values higher than 23, indicating medium dense to very dense sand.

2.4.3 Proposed Parking Lots, Driveways, and Athletic Fields

This section describes the subsurface conditions encountered in the borings and test pits in the proposed parking lots, driveways, and athletic fields, including borings B-7 to B-8, B-115, and B-120A to B-124, and test pits TP-10 to TP-14, TP-108, TP-115-IT to TP-118-IT, TP-120 to TP-122, and TP-126 to TP-128. These borings extended to depths ranging between 10.8 and 46 feet, and the test pits extended to depths ranging between 8.5 and 12 feet beneath the ground surface. A summary of the borings and test pits for the proposed parking lots, driveways, and athletic fields is shown in Table 4A and Table 4B.

The soil strata encountered in the borings and test pits were as follows, starting at the ground surface:

Asphalt – Asphalt was encountered at the ground surface in borings B-8 and B-121 with thicknesses of 6 inches and 2 inches, respectively.

Topsoil/Subsoil – A layer of organic topsoil soil was encountered at the ground surface in borings B-7, B-115, B-120A, and B-122 to B-124, and in all the test pits. The thickness of the topsoil ranged between 0.4 to 2.8 feet beneath the ground surface. Subsoil was encountered below the topsoil in the boring B-7 and in test pits TP-10, TP-126 to TP-128. The subsoil extended to depths ranging between 2 to 5.8 feet below the ground surface. The subsoil was described mostly as silty sand and less frequently as poorly graded sand with silt or poorly graded sand. The percentage of fines ranged up to 25 percent. The percentage of gravel ranged between 5 to 20 percent. Traces of organic fines and roots were observed in the subsoil.

Fill – A layer of fill was encountered beneath the asphalt or topsoil/subsoil in all the borings and in all the test pits except TP-10 and TP-126 to TP-128. The fill extended to depths ranging between 2.1 and 16.5 feet beneath the ground surface. The fill consisted mostly of silty sand and occasionally poorly graded sand. One sample of fill was described as silty gravel and another as silt with sand. The percentage of fines ranged between 15 to 45 percent. The percentage of gravel ranged between traces of fine gravel up to approximately 45 percent. The fill contained traces of organics, roots, and wood. Five samples of fill contained traces of asphalt, brick, concrete, construction debris, and plastic. The fill also contained between 5 to 10 percent cobbles up to 8 inches in diameter and up to 5 percent boulders up to 2 feet in diameter.

The SPT N-values of the fill ranged between 2 and over 100 bpf, with most values between 2 and 41 bpf, indicating very loose to dense material. The high SPT N-values may be caused by cobbles and boulders in the fill and may not represent the true density of the fill.

A layer of buried organic soil was observed below the fill in test pit TP-11 and extended to 6 feet below the ground surface.

Sand – A layer of sand was encountered beneath the topsoil/subsoil or fill in all borings and in all test pits except in TP-13 and TP-122. This layer extended to the termination depths of the boring and test pits. In test pit TP-13, a layer of silt with sand and gravel was encountered beneath the fill layer. The sand was mostly described as silty sand and less frequently as well graded sand. One sample was described as poorly graded sand with silt. The percentage of fines in the sand ranged between 10 to 35 percent. The percentage of gravel ranged between traces of gravel up to approximately 30 percent. The sand layer contained approximately 5 percent boulders ranging between 1.5 to 4 feet in diameter. The layer of sand also contained between 5 and 10 percent cobbles up to 8 inches in diameter.

The SPT N-values in the sand layer ranged between 9 and over 100 bpf, with most SPT N-values between 21 to 100 bpf, indicating medium dense to very dense sand.

2.5 Groundwater

2.5.1 General

The groundwater data obtained during the drilling or excavation and reported in this report is based on observations made during or shortly after the completion of the subsurface explorations and may not represent the actual groundwater levels, as additional time may be required for the groundwater levels to stabilize. Water was introduced into the boreholes during drilling, and the groundwater levels measured at the end of drilling in the borings may not be representative of the actual groundwater conditions. The groundwater levels presented in this report only represent the conditions encountered at the time and location of our explorations. Seasonal fluctuation should be anticipated.

2.5.2 Proposed Building

Groundwater was observed in the borings and test pits advanced within the footprint of the proposed building at depths ranging between 1 and 25.1 feet below ground surface. Three (3) groundwater observation wells were installed within or near the proposed building footprint, including B-103-OW, B-110-OW, and B-118B-OW. The groundwater level measured in the groundwater observation wells are shown in Table 5. The groundwater data available through March 1, 2018 indicates that the groundwater is lower than the FFE of the First Floor but is at or slightly higher than the FFE of the Ground Floor.

2.5.3 Proposed Retaining Wall on Southern Side

Groundwater was observed in the borings and test pits advanced along or near the alignment of the proposed southern retaining wall at depths ranging between 1.5 and 9.4 feet below the ground surface. One (1) groundwater observation well was installed in boring B-128-OW. The groundwater level measured in this groundwater observation well is shown in Table 5. The groundwater data indicate that on March 1, 2018 the groundwater level in groundwater observation well B-128-OW was at El. 778.7 feet. This elevation is higher than the ground surface on the lower side of the proposed wall at the location of the well.

2.5.4 Proposed Parking Lots, Driveways, and Athletic Fields

Groundwater was observed in the borings and test pits in the proposed parking lots, driveways, and athletic fields at depths ranging between 2.5 and 21 feet below ground surface. One (1) groundwater observation well was installed in boring B-123-OW. The groundwater level measured in this groundwater observation well is shown in Table 5. The groundwater level measured in the groundwater observation well on March 1, 2018 in B-123-OW was at El. 773.3 feet. This elevation is lower than the proposed grade at the location of the groundwater observation well.

2.6 Double Ring Infiltrometer Tests

LGCI performed five (5) double ring infiltrometer tests in test pits TP-101-IT, TP-105-IT, TP-115-IT, TP-118-IT, and TP-121-IT. These locations were selected by Nitsch. The tests were conducted in general accordance with ASTM Standard D 3385.

The excavations were first advanced to the test depths of 3 to 4 feet beneath the existing ground surface, where the test pit bottom was leveled using the excavator bucket. After the infiltrometer rings were driven into the ground, the tests were conducted by filling the rings with water. The test pits were advanced deeper after the completion of the tests.

The test results are included in Appendix D. The results include plots of the hydraulic conductivity for flow within the inner and outer rings. The stabilized portions of the plots for the inner ring indicate the permeability values. The results indicate generally low permeability values.

2.7 Laboratory Test Data

LGCI submitted seventeen (17) soil samples obtained from the borings and test pits for grain-size analysis. The laboratory data sheets are included in Appendix E and the results are summarized below.

Test Pit/ Boring	Sample ID	Sample Depth (ft)	Material	Percent Gravel	Percent Sand	Percent Fines
B-5	S2	2 – 4	Fill	47	30.6	22.4
B-7	S2	2 – 4	Fill	31.5	29.4	39.1
B-8	S2	2 – 4	Fill	13.4	42.4	44.2
B-8	S3	4 – 6	Natural Soil	30.8	35.9	33.3
B-105	S3	4 – 6	Fill	3.3	49.8	46.9
B-110	S2	2 – 4	Fill	40	35.6	24.4
B-110	S4	6 – 8	Natural	20.4	51.7	27.9
B-118B-OW	S4	6 – 8	Natural	37.8	36	26.2
B-119A	S4	6 – 8	Fill	31.6	40.8	27.6
B-119A	S7	16 – 18	Natural	32.9	28.9	38.2
B-124	S3	4 – 6	Fill	40.6	44	15.4
TP-101-IT	S2	1 – 7	Fill	15.2	52.5	32.3
TP-102	S2	2 – 6	Fill	6	47.6	46.4
TP-111	S2	0.8 – 5	Fill	32.8	41.1	26.1
TP-120	S2	2.5 – 5	Fill	6.4	51.7	41.9
TP-120	S3	5 – 12	Natural	23.2	47.8	29
TP-124	S2	1 – 7	Fill	34.3	45.5	20.2

3. EVALUATION AND RECOMMENDATIONS

3.1 Foundation Recommendations

3.1.1 General

Based on our field observations, our understanding of the proposed construction, our observation of borings and test pits, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

<u>Removal of Topsoil/Subsoil, Fill, and Buried Topsoil</u> - The topsoil, the subsoil, the existing fill, and the buried organic soil are not suitable to support the proposed building and should be entirely removed from within the proposed building footprint. The surficial topsoil and the subsoil should be removed from within the footprint of the paved areas and athletic fields.

Based on our explorations, the topsoil/subsoil removal is anticipated to generally extend to depths ranging between about 0.4 and 3.5 feet beneath the ground surface. In a few locations, the removal of the topsoil and subsoil may extend to depths of up to 6 feet.

The existing fill encountered within the proposed A and AB Buildings (First Floor) extended to depths ranging between 2 and 8 feet beneath the ground surface but was generally less than 6 feet deep. It contained a few organics and did not overlay buried organic soil. This fill could be reused after being processed with rock to produce Structural Fill as described below.

The fill and the buried organic soil in the proposed B1 and B2 Buildings extended to depths of up to 12 feet beneath the ground surface. Some of this fill contained organics, and in a few locations, it overlaid organic soil. We anticipate that this fill will not be suitable for reuse. In any case, the existing fill free of organics should be stockpiled separately.

The proposed building foundations should bear on Structural Fill placed directly on the natural sand.

We anticipate that the major consideration during construction will be the removal of the topsoil and subsoil, the existing fill, and the buried topsoil, and the handling and stockpiling of the excavated materials. Excavated topsoil and subsoil, and the buried organic soil should be stockpiled separately from the excavated existing fill.

<u>Ground Improvements</u> – We have considered improving the existing fill in place using aggregate piers or rigid inclusions. However, due to the presence of boulders in the fill, implementation of one of these ground improvement techniques would require pre-trenching for the boulders, i.e., excavating the existing fill to cull out the boulders. We dismissed this option as it would require excavating the fill and placing it back in place after the boulders are removed and before implementing the ground improvements. We believe that this option

is less economical than removing the existing fill, processing it by crushing it with rock, and placing the processed material back as described below.

We have also considered Rapid Impact Compaction. This is a new technology that consists of repeatedly striking an impact plate on the ground surface using a high-energy hydraulic hammer. Rapid Impact Compaction can improve soils to depths of up to 15 feet and does not generate spoils. We dismissed this improvement option due to the presence of buried organic soil observed in the explorations within the proposed B1 and B2 Buildings.

<u>Processing Onsite Materials</u> – To the extent possible, onsite materials should be reused to reduce the quantity of materials disposed of offsite. Based on our explorations, the existing fill and the existing sand are too silty for reuse but can be improved by blending them with clean gravel or with crushed stone. Our explorations indicated that the existing fill contained between 5 and 10 percent cobbles and boulders. The existing sand also contained cobbles and boulders. Accordingly, we believe that the existing fill free of organics and the existing sand could be processed in a crusher with the cobbles and boulders to produce granular fill that is lower in fines and that could be used as Structural Fill or Ordinary Fill if blended with a sufficient proportion of rock. The existing fill free of organics should be stockpiled separately for possible processing before reuse. Materials slated for processing should first be observed by LGCI. To augment the quantity of rock to process with the existing fill and the natural sand, the contractor may consider importing blasted rock to blend it with the existing fill and the natural sand before crushing.

The reuse of onsite materials should be coordinated with the project environmental professional.

3.1.2 Footing Design

- The topsoil/subsoil layer and the existing fill are not suitable to support the proposed footings and should be entirely removed from within the proposed building. The removal should extend beyond the proposed building footprint a distance equal to the distance between the bottom of the proposed footings and the natural soil or 5 feet, whichever is greater.

- We recommend supporting the proposed building on spread and continuous footings bearing on Structural Fill placed directly over the natural soil.

- For footing design, we recommend using a net allowable bearing pressure of 4,000 pounds per square foot (psf).

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- All foundations should be designed in accordance with *The Commonwealth of Massachusetts State Building Code 780 CMR, Ninth Edition* (MSBC 9th Edition).

- Exterior footings and footings in unheated areas that are placed on the natural soil should be placed at a minimum depth of 4 feet below the final exterior grade to provide adequate frost cover protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- We recommend that wall footings have a minimum width of 2 feet, and that column footings have a minimum width of 3 feet. For foundations with a least lateral dimension smaller than 3 feet, the allowable bearing pressure should be reduced to 1/3 of the recommended allowable bearing pressure times the least dimension in feet.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

- A representative of LGCI should observe the subgrade of footings to verify that the footing subgrade has been prepared in accordance with our recommendations.

3.1.3 Settlement

We estimate for foundations constructed in accordance with the recommendations contained in this report, that the total post-construction settlement will be less than about 1 inch and that the differential settlement will be 3/4 inch or less over a distance of 25 feet. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.2 Concrete Slab Considerations

- The proposed floor slabs can be constructed as slabs-on-grade.

- The proposed floor slabs should be supported on a minimum of 12 inches of Structural Fill placed directly over the natural soil.

- We understand that a radon mitigation system will be installed beneath the proposed slab. We understand that the radon mitigation system will include a layer of 12 inches of crushed stone placed directly under the proposed slab. Where a radon mitigation system is installed, the 12 inches of crushed stone could be substituted for the Structural Fill recommended above.

- Where an under-slab drainage system installed, such as under the slab of the proposed B1 and B2 Buildings, a layer of crushed stone will be placed under the proposed slab, and the Structural Fill recommended above will not be needed. Our recommendations for the under-slab drainage system are presented in Section 3.3.

- Exposed boulders should be removed from the subgrade of the slab and the resulting excavation should be backfilled with Structural Fill.

- A vapor retarder membrane with a minimum thickness of 15 mils could be used beneath the slab. The need for such a membrane should be determined by the architect. The membrane should be protected from puncture during placement of the steel mesh and construction of the slabs.

- For the design of the floor slabs bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf) (116 pci). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\,\mathrm{Re}\,action\,(k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area,
k_{s1} =Coefficient of vertical subgrade reaction for 1 x 1 square foot area, and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed for construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- Backfill in interior and exterior utility trenches should be properly compacted.

- In order for the movement of exterior slabs not to be transmitted to the building foundation or superstructure, exterior slabs such as approach slabs and sidewalks, should be isolated from the building superstructure.

3.3 Under-slab Drains

Based on the groundwater levels observed in the borings and test pits, and measured in the groundwater observation wells, an under-slab drainage system is not required beneath the proposed A and AB Buildings' slabs. An under-slab drainage system is required beneath the proposed B1 and B2 Buildings' slabs.

The under-slab drainage system should consist of: 1) a minimum of 9 inches of ¾-inch crushed stone placed below the entire concrete slab, and 2) 6-inch-diameter slotted PVC pipes installed with their inverts at least 15 inches below the bottom of the slab. The pipes should be installed in trenches with a maximum spacing of 20 feet. The trenches should be at least 18 inches wide and 12 inches deep (below the bottom of the 9 inches of crushed stone) to allow placing crushed stone around the PVC pipes.

A non-woven geotextile fabric should be installed for separation between the crushed stone and the underlying soil. The slots on the PVC pipe should be placed facing downward to allow for entry of water at the bottom of the pipe. Clean-outs should be included at the end of each branch and at all changes in direction.

If possible, the water from the under-slab drain should be channeled to flow by gravity to a discharge area or to the City storm drainage system. If the water from the drainage system is channeled to the City storm drainage system, the owner should apply for a discharge permit and should perform analytical tests as required by the permits.

3.4 Seismic Design Criteria

In accordance with Section 1613 of MSBC 9th Edition, the seismic criteria for the site are as follows:

- Site Class: D
- Spectral Response Acceleration at short period (S_s): 0.180g
- Spectral Response Acceleration at 1 sec. (S_1): 0.066g
- Site Coefficient F_a (Table 9.4.1.2.4a): 1.6
- Site Coefficient F_v (Table 9.4.1.2.4b): 2.4
- Adjusted spectral response S_{ms}: 0.288 g
- Adjusted spectral responses S_{m1}: 0.158 g

Based on our observations in the test pits and the results of the borings, the natural soil at the site is not susceptible to liquefaction during a seismic event.

3.5 Lateral Pressures for Wall Design and Perimeter Drains

3.5.1 Lateral Earth Pressures

We recommend using the following values for the design of retaining walls:

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of At-Rest Earth Pressure, K_o:	0.5
Coefficient of Passive Earth Pressure, K_p:	3.2
Total Unit Weight, γ:	125 pounds per cubic foot

Note: The values in the table are based on a friction angle for the backfill of 32 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and a vertical wall face.

- Exterior walls of below ground spaces and the wall separating the two slab levels should be designed using the “at-rest” pressure coefficient.

- Site retaining walls should be designed using the active earth pressure coefficient described above.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key.

- Where a permanent vertical uniform load will be applied on the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary construction surcharge of 100 psf should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.50 between the natural soil and the bottom of the retaining wall. Retaining walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning.

3.5.2 Seismic Pressure

- In accordance with the *Massachusetts State Building Code, 9th Edition*, Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of the wall (for horizontal backfill), where S_s is the maximum considered earthquake spectral response acceleration (defined in Section 3.4), F_a is the site coefficient (defined in Section 3.4), γ is the total unit weight of the soil backfill, and H is the height of the wall.

  The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 shall be applied to the earthquake force for wall strength design.

- Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time shall be included in the total static lateral soil pressure and their earthquake lateral force shall be computed and added to the force determined above.

3.5.3 Perimeter Drains

- We recommend that free-draining material be placed within 3 feet of the exterior of walls of below ground spaces and behind site retaining walls.

- To reduce the potential for dampness in below ground spaces, proposed below ground walls should be damp-proofed.

- We recommend that drains be provided behind the exterior of walls of below ground spaces, including the southern perimeter wall of the proposed B1 and B2 Buildings, behind the wall at the transition between the proposed AB Building and the B1 and B2 Buildings; and behind site retaining walls. The drains should consist of 6-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile for separation and filtration.

- Groundwater collected by the wall drains could be discharged in a lower area if gravity flow is possible. Alternatively, it should be discharged into the street drains. A permit would be required for discharge into street drains. For site retaining walls, the water collected from the drains could be discharged through weep holes. If wetness on the face of the wall is not desirable, the wall drains should be connected to the street drains.

3.6 Parking Lots, Driveways, and Sidewalks

3.6.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, and sidewalks after preparation of the subgrade as described in Section 4.1.

- We recommend removing the topsoil and subsoil within the footprint of the proposed driveways and parking lots.

- Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement.

- The existing fill should be improved in the proposed areas in accordance with the recommendations in section 4.1 before placing the subbase layer or other fill to meet the proposed grades.

3.6.2 Typical Pavement Section

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

- 1.5" Asphalt "Top Course"
- 2.0" Asphalt "Base Course"
- 8" Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for areas of heavy truck traffic is as follows:

- 2.0" Asphalt "Top Course"
- 2.5" Asphalt "Base Course"
- 12" Processed Gravel for Sub-Base (MassDOT M1.03.1)

Dense-graded Crushed Stone for Sub-base (MassDOT M2.01.7) could be used in lieu of the Processed Gravel for Subbase (MassDOT M1.03.1) recommended above.

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the “Standard Specifications for Highways and Bridges,” prepared by the Commonwealth of Massachusetts Department of Public Works and dated 1988 (with the latest Supplemental Specifications).

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.6.3 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

- We recommend that drains be installed under sidewalks along the proposed retaining wall on the southern side of the site. The drains should be installed beneath the inner side of the curbs under sidewalks. The drain should consist of 6-inch perforated pipe with the perforations facing down, installed with its invert at least 15 inches beneath the top bottom of the sidewalk. The pipe should be surrounded by at least 6 inches of crushed stone on all sides. The crushed stone should be wrapped in a geotextile fabric.

- LGCI will continue monitoring the groundwater observation wells, and may revise our recommendations to include sidewalk drains at other locations based on the groundwater data,

3.7 Athletic Fields

The existing subsurface conditions are suitable to support the proposed athletic fields after the subgrade is prepared in accordance with the recommendations in this report.

- The existing topsoil should be removed before placing fill to raise the grades to meet the proposed finished elevations.

- The subsoil may remain in place after it is proofrolled in accordance with the recommendations in Section 4.1.

- Reuse of onsite materials as fill within the proposed athletic fields should be in accordance with the recommendations in Section 4.4.

3.8 Slope Stability Analyses

We understand that the proposed site retaining walls will be designed by the contractor. LGCI will perform slope stability analyses on the proposed walls after a geometry of the proposed walls, including wall types, heights, and widths are established by the contractor. LGCI generally needs about three weeks from the time the design submittal for the proposed site walls is submitted by the contactor to complete our analyses.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- The topsoil/subsoil layer, root balls, organic soil, the existing fill, and other deleterious matter should be entirely removed from within the proposed building footprint.

- Topsoil/subsoil, organic material, root balls, and other deleterious material should be entirely removed from within the paved areas.

- Foundations of the existing buildings, abandoned foundations, and other abandoned below ground structures should be entirely removed from within the entire construction area.

- The site contractor should note that the subsoil, existing fill, and the underlying natural soil are high in fines and contain boulders.

- Cobbles and boulders should be removed at least 6 inches from beneath footings, i.e., 4.5 feet beneath the proposed FFE within the entire building footprint, and 18 inches beneath the bottom of paved areas, and 24 inches beneath the base material for the turf in athletic fields. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas and under the base material in athletic fields.

- The base material of athletic fields should conform to the gradation and placement requirements of the landscape architect or the manufacturer/installer of synthetic turf.

- The base of the footing excavations in the natural soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade, before placing concrete.

- The subgrades of slabs and paved areas in the natural soil should be compacted with a heavy vibratory roller compactor imparting a dynamic effort of at least 40 kips.

- Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic soil should be removed and replaced with Structural Fill within the building and with Ordinary Fill beneath the subbase of paved areas.

- Due to the high susceptibility of the natural soil for disturbance under foot and vehicular traffic, we recommend placing a minimum of 6 inches of Structural Fill or ¾-inch crushed stone under footings on top of the natural soil to provide a firm working surface during placement of formwork and rebar.

- After the topsoil and subsoil are removed from within the proposed paved areas, the existing fill should be improved by compacting the exposed surface of the existing fill with at least six

(6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones of soil are observed, the soft soil should be removed and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer.

- After the topsoil is removed from within the proposed athletic fields, the exposed subsoil, existing fill, or natural soil should be proofrolled with a loaded rubber tire truck or with a large vibratory roller compactor imparting a minimum dynamic effort of 40 kips. Where soft zones are indicated by the proofrolling, the soft zone should be removed and the grades should be restored using Ordinary Fill to the bottom of the base material of the proposed turf designed by the landscape architect or the manufacturer/installer of synthetic turf.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill shown in Section 4.3.

- Fill placed under the subbase of paved areas and under the base material of athletic fields, should meet the gradation and compaction requirements of Ordinary Fill shown in Section 4.3.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- When crushed stone is required in the drawings or is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation.

- An LGCI geotechnical engineer or his representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed, and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill or crushed stone wrapped in geotextile fabric for separation.

4.2 Subgrade Protection

The onsite sand may be frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final six inches of soil just before pouring concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operation should be halted in freezing weather.

Materials with high fines contents are typically difficult to handle when wet as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6, and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
3 inches	100
1 ½ inch	80 - 100
½ inch	50 – 100
No. 4	30 – 85
No. 20	15 – 60
No. 60	5 – 35
No. 200*	0 – 10

* 0 – 5 Under sidewalks and outdoor slabs

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6, and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
6 inches	100
1 inch	50 - 100
No. 4	20 – 100
No. 20	10 - 70
No. 60	5 – 45
No. 200	0 – 20

4.4 Reuse of Onsite Materials

Based on the grain-size analyses, and our field observations, the existing fill and the natural soil at the site do not meet the gradation requirements for Structural Fill and/or Ordinary Fill.

Materials to be used as fill should first be tested for compliance with the applicable gradation specifications.

The reuse of the onsite materials as described in this section should be coordinated with the project environmental professional.

4.4.1 Reuse of Processed Onsite Materials

The contractor may consider mobilizing a rock crusher to the site. Cobbles and boulders and imported blasted rock can be processed by blending them with the existing fill clean of organic material and natural soil and crushing them to produce a well graded material. Materials processed onsite should meet the gradation requirements of Ordinary Fill and Structural Fill. Materials produced by the crushing operation should be well graded so as to reduce the potential for formation of honey-combs during their placement and compaction. The contractor may consider augmenting the quantity of rock by importing blasted rock for processing with the onsite materials.

Before material is produced for use onsite, the contractor should produce a few batches of material processed using different blending ratios. Grain-size analyses should be performed on each batch. The rock content in the processed material should not be so high that honey combs are formed during placement of the material. Once blending ratios that produce material meeting the gradation requirements of Ordinary Fill or Structural Fill are established, they should be used during the processing operations. Periodic grain-size analyses should be performed to make sure that the proper gradation is maintained.

4.4.2 Reuse of Unprocessed Onsite Materials

In deep fill areas within the proposed paved areas and athletic fields, excavated onsite fill free of organic soil and natural sand could be reused without processing if the following recommendations are followed:

- Large particles (larger than 6 inches) should be culled out or screened.

- Unprocessed materials should not be used within 3 feet of finished grades under parking lots and athletic fields.

- Unprocessed materials should not be used within the proposed building footprint.

- Please note that soils with more than 20 percent fines contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during stockpiling, placement, and compaction of the onsite soils.

- Unprocessed materials should not be used during wet weather or when they are wet.

- The contractor should protect stockpiled unprocessed materials from exposure to moisture using tarps. The tarps should be secured so as not to be moved by wind or other action.

- Where placed and compacted unprocessed material becomes soft, it should be removed and replaced with suitable backfill at contractor’s expense.

4.5 Groundwater Control Procedures

Based on the groundwater levels encountered in our explorations, we anticipate that groundwater control procedures will be needed for footing and utility excavations. We anticipate that filtered sump pumps installed in pits located at least three feet below the bottom of the excavation may be sufficient to handle surface runoff that may enter the excavation. Where deep trenches are required for utilities, multiple sump pumps would be required to maintain a dry excavation subgrade.

Depending on the type of SOE system used to support the excavation on the southern side of the proposed B1 and B2 Building (in proximity of the northern side of the existing building), well points will be required to lower the groundwater table. The well points should be deep enough and should be installed in grid to maintain the groundwater level at least one foot below the bottom of the excavation. Due to the granular nature of the natural soil, lowering the groundwater table is not anticipated to cause significant settlement of the existing building.

The contractor should submit a groundwater control plan at least two weeks before the start of excavations. The submittal should include details about the components, layout, depth, and installation procedure of the system.

The contractor should be permitted to employ whatever commonly accepted means and practices as necessary to maintain the groundwater level below the bottom of the excavation, and to maintain a dry excavation during wet weather. Groundwater levels should be maintained at a minimum of 1-foot below the bottom of excavations during construction. Placement of reinforcing steel or concrete in standing water should not be permitted.

Proper permits should be obtained from authorities having jurisdiction over the work. At a minimum, the water collected from excavations should be filtered for fines in sedimentation basins before being discharged. The sedimentation basins could be constructed of hay bales wrapped in a geotextile fabric.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric for separation. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use and the sump pump pit should be restored with suitable backfill.

4.6 Temporary Excavations

A temporary support of excavation (SOE) system will be required on the southern side of the proposed B1 and B2 Buildings. The SOE system will be designed by the contractor. The type of SOE system should be selected to safely support the excavation, protect the foundations of the existing building, and maintain a dry excavation. Due to the possible presence of boulders in the existing fill and in the natural sand, we believe that a sheet pile wall will not be feasible. We understand that a soldier pile and lagging wall or a soil nail wall are being considered by the contractor. If a soldier pile and lagging wall is used, the soldier piles should be drilled-in to reduce vibrations and possible damage to the existing building. Care should be exercised during the installation of the bracing of the soldier pile and lagging (tiebacks) and during the installation of the soil nails, if a soil nail wall is used, to reduce the potential for loss of ground that may create a sinkhole beneath the foundation of the existing building.

SOE systems may also be needed at the transition between the proposed AB Building and the B1 and B2 Building, and possibly for the proposed southern retaining wall.

The contractor should submit details about the SOE systems at least two weeks before the start of installation of the SOE systems. The submittals should include details about the components of the system, layout and cross sections showing the subsurface conditions at the cross sections, installation sequence and procedure, and calculations showing anticipated movements of the SOE systems. The SOE submittal should be coordinated with the groundwater control submittal.

All excavations to receive human traffic, including utility trenches, basement or footing excavations, or others (i.e. underground storage tanks, etc.), should be constructed in accordance with the OSHA guidelines.

The site soils should generally be considered Type “C” and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom.

5. FUTURE WORK

LGCI’s scope includes the following services:

- Assisting LPA in preparing Earth Moving specifications and reviewing the geotechnical aspect of foundation drawings.
- Reviewing the geotechnical aspects of contractor submittals and RFIs.
- Performing slope stability analyses on permanent site retaining walls.
- Providing a field representative during construction to observe the subgrades for footings, floor slabs, and paved areas, and submitting daily field reports documenting our observations and field recommendations.

  Submittals and RFIs should be submitted to LGCI at least two to three weeks before our responses are due so that we have adequate time to review and comment.

6. REPORT LIMITATIONS

Our analysis and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Lamoureux Pagano & Associates, Inc. for the specific application to the proposed Worcester South High School in Worcester, Massachusetts as conceived at this time.

7. REFERENCES

The Commonwealth of Massachusetts (2017), "The Massachusetts State Building Code, 780 CMR, Ninth Edition."

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

Massachusetts Highway Department (1988), "Standard Specifications for Highways and Bridges."

Massachusetts Highway Department (2013), "Supplemental Specification to the 1988 Standard Specifications for Highways and Bridges."

USGS - Worcester, MA topographic map from www.digital-topo-maps.com

Table 1A - Summary of LGCI Borings
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Asphalt/Concrete Depth / El. (ft.)	Bottom of Topsoil/Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
Borings performed in 2017						
B-1	746.0	3.5 / **742.5**	0.5 / **745.5**	- / -	12.0 / **734.0**	17.0 / **729.0**
B-2	766.0	4.5 / **761.5**	- / -	2.0 / **764.0**	- / -	21.0 / **745.0**
B-3	766.0	1.0 / **765.0**	- / -	0.5 / **765.5**	2.0 / **764.0**	21.0 / **745.0**
B-4	766.0	5.0 / **761.0**	- / -	2.0 / **764.0**	4.0 / **762.0**	21.0 / **745.0**
B-5	766.0	11.5 / **754.5**	- / -	0.4 / **765.6**	8.0 / **758.0**	21.0 / **745.0**
B-6	765.5	2.5 / **763.0**	- / -	2.0 / **763.5**	6.0 / **759.5**	21.0 / **744.5**
B-7	769.5	3.0 / **766.5**	- / -	2.0 / **767.5**	6.0 / **763.5**	16.0 / **753.5**
B-8	783.5	4.0 / **779.5**	0.5 / **783.0**	- / -	4.0 / **779.5**	21.0 / **762.5**
Borings performed in 2018						
B-101	764.9	1.7 / **763.2**	- / -	6.0 / **758.9**	- / -	16.0 / **748.9**
B-102	767.0	2.0 / **765.0**	- / -	2.0 / **765.0**	- / -	10.0 / **757.0**
B-103-OW	767.0	8.9 / **758.1**	- / -	2.0 / **765.0**	- / -	17.0 / **750.0**
B-104	767.1	2.2 / **764.9**	- / -	2.0 / **765.1**	- / -	16.0 / **751.1**
B-105	765.2	- / -	- / -	0.6 / **764.6**	6.0 / **759.2**	17.0 / **748.2**
B-106	766.5	1.8 / **764.7**	- / -	0.5 / **766.0**	6.0 / **760.5**	16.0 / **750.5**
B-107	765.9	8.0 / **757.9**	- / -	4.0 / **761.9**	- / -	34.5 / **731.4**
B-108	763.3	6.0 / **757.3**	0.3 / **763.0**	- / -	4.0 / **759.3**	34.1 / **729.2**
B-109	766.7	8.0 / **758.7**	0.2 / **766.5**	- / -	2.0 / **764.7**	36.0 / **730.7**
B-110-OW	765.4	13.7 / **751.7**	- / -	0.4 / **765.0**	4.0 / **761.4**	35.8 / **729.6**
B-111	749.6	- / -	0.3 / **749.3**	- / -	8.0 / **741.6**	15.0 / **734.6**
B-112	748.6	- / -	0.2 / **748.4**	- / -	8.0 / **740.6**	15.0 / **733.6**
B-113[3]	745.7	14.3 / **731.4**	- / -	2.0 / **743.7**	12.0 / **733.7**	14.5 / **731.2**
B-114	745.6	- / -	0.3 / **745.3**	- / -	4.0 / **741.6**	15.0 / **730.6**
B-115	741.1	- / -	- / -	0.4 / **740.7**	16.5 / **724.6**	19.2 / **721.9**
B-116	767.4	7.5 / **759.9**	0.3 / **767.1**	- / -	4.0 / **763.4**	39.0 / **728.4**
B-117B[3]	769.5	8.0 / **761.5**	- / -	2.0 / **767.5**	8.0 / **761.5**	41.0 / **728.5**
B-118B-OW[3]	775.0	12.5 / **762.5**	- / -	2.7 / **772.3**	6.0 / **769.0**	41.0 / **734.0**
B-119A[3]	777.7	8.0 / **769.7**	- / -	4.0 / **773.7**	8.0 / **769.7**	41.0 / **736.7**
B-120A[3]	778.9	9.0 / **769.9**	- / -	0.5 / **778.4**	8.0 / **770.9**	46.0 / **732.9**
B-121[3]	774.8	21.0 / **753.8**	0.2 / **774.6**	- / -	4.0 / **770.8**	27.0 / **747.8**
B-122[3]	775.8	18.0 / **757.8**	- / -	2.0 / **773.8**	16.0 / **759.8**	22.0 / **753.8**
B-123-OW	788.3	18.7 / **769.6**	- / -	2.4 / **785.9**	4.0 / **784.3**	22.0 / **766.3**
B-124	784.5	2.5 / **782.0**	- / -	0.6 / **783.9**	8.0 / **776.5**	10.8 / **773.7**
B-125[3]	782.8	- / -	0.3 / **782.5**	- / -	4.0 / **778.8**	17.0 / **765.8**
B-126	See Note 5					
B-127	788.7	6.1 / **782.6**	- / -	- / -	- / -	26.0 / **762.7**
B-128-OW	790.5	9.4 / **781.1**	- / -	6.5 / **784.0**	- / -	31.0 / **759.5**
B-129	784.2	8.0 / **776.2**	- / -	8.0 / **776.2**	- / -	31.0 / **753.2**
B-130	768.5	7.2 / **761.3**	- / -	4.0 / **764.5**	- / -	30.8 / **737.7**
B-131[3]	749.4	25.1 / **724.3**	0.5 / **748.9**	- / -	12.0 / **737.4**	27.4 / **722.0**

1. Ground surface elevations for 2017 test pits interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017. Ground surface elevations for 2018 borings provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater generally observed at the end of drilling or based on sample moisture. B-5 measured 15 hours after drilling.
3. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26,2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
4. "-" means layer not encountered.
5. Borings nor performed due to difficult access.

Table 1B - Summary of LGCI Test Pits
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Topsoil / Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Test Pit Depth / El. (ft.)
Test pits performed in 2017					
TP-1	746.5	- / **-**	1.0 / **745.5**	- / **-**	8.0 / **738.5**
TP-2	752.0	- / **-**	0.9 / **751.1**	3.3 / **748.8**	13.0 / **739.0**
TP-3	763.5	9.0 / **754.5**	0.8 / **762.7**	3.2 / **760.3**	9.0 / **754.5**
TP-4	763.0	- / **-**	2.5 / **760.5**	- / **-**	12.5 / **750.5**
TP-5	766.0	- / **-**	2.0 / **764.0**	6.1 / **759.9**	9.5 / **756.5**
TP-6	766.0	- / **-**	0.8 / **765.2**	4.7 / **761.3**	12.3 / **753.7**
TP-7	766.0	- / **-**	1.5 / **764.5**	- / -	12.0 / **754.0**
TP-8	766.0	- / **-**	2.1 / **763.9**	- / **-**	10.8 / **755.2**
TP-9	766.0	- / **-**	2.0 / **764.0**	4.0 / **762.0**	12.7 / **753.3**
TP-10	767.0	8.7 / **758.3**	2.0 / **765.0**	- / **-**	9.8 / **757.2**
TP-11	767.5	- / **-**	0.8 / **766.7**	6.0 / **761.5**	9.4 / **758.1**
TP-12	769.0	- / **-**	0.6 / **768.4**	2.1 / **766.9**	10.0 / **759.0**
TP-13	769.5	10.0 / **759.5**	1.5 / **768.0**	6.5 / **763.0**	10.1 / **759.4**
TP-14	766.0	- / **-**	0.8 / **765.2**	4.0 / **762.0**	10.0 / **756.0**
Test pits performed in 2018					
TP-101-IT[3]	765.9	- / **-**	1.0 / **764.9**	7.0 / **758.9**	13.0 / **752.9**
TP-102	766.4	- / **-**	1.3 / **765.1**	6.0 / **760.4**	12.5 / **753.9**
TP-103	767.0	- / **-**	1.3 / **765.7**	5.0 / **762.0**	12.0 / **755.0**
TP-104	766.0	- / **-**	0.7 / **765.3**	2.0 / **764.0**	12.0 / **754.0**
TP-105-IT[3]	766.0	9.0 / **757.0**	0.8 / **765.2**	5.0 / **761.0**	9.0 / **757.0**
TP-106	766.5	- / **-**	0.9 / **765.6**	2.0 / **764.5**	11.0 / **755.5**
TP-107	767.1	- / **-**	0.7 / **766.4**	1.9 / **765.2**	12.0 / **755.1**
TP-108	769.0	- / **-**	0.8 / **768.2**	3.5 / **765.5**	12.0 / **757.0**
TP-109	767.1	8.8 / **758.3**	0.8 / **766.3**	5.0 / **762.1**	12.0 / **755.1**
TP-110	767.0	- / **-**	1.0 / **766.0**	4.0 / **763.0**	12.0 / **755.0**
TP-111	766.3	- / **-**	0.8 / **765.5**	7.0 / **759.3**	12.0 / **754.3**
TP-112	752.5	3.5 / **749.0**	3.5 / **749.0**	8.0 / **744.5**	8.5 / **744.0**
TP-113	748.0	- / **-**	1.5 / **746.5**	12.0 / **736.0**	14.0 / **734.0**
TP-114	744.6	3.5 / **741.1**	1.5 / **743.1**	12.0 / **732.6**	12.0 / **732.6**
TP-115-IT[3]	768.7	10.5 / **758.2**	0.8 / **767.9**	3.0 / **765.7**	12.0 / **756.7**
TP-116	See Note 5				
TP-117	769.7	10.5 / **759.2**	1.0 / **768.7**	3.5 / **766.2**	12.0 / **757.7**
TP-118-IT[3]	774.5	- / **-**	0.5 / **774.0**	9.5 / **765.0**	9.5 / **765.0**
TP-119	783.9	1.5 / **782.4**	1.0 / **782.9**	3.0 / **780.9**	12.0 / **771.9**
TP-120	786.8	- / **-**	2.5 / **784.3**	5.0 / **781.8**	12.0 / **774.8**
TP-121-IT[3]	784.0	- / **-**	2.0 / **782.0**	3.0 / **781.0**	12.0 / **772.0**
TP-122	784.2	- / **-**	1.5 / **782.7**	8.5 / **775.7**	8.5 / **775.7**
TP-123	See Note 5				
TP-124	789.7	5.0 / **784.7**	1.0 / **788.7**	7.0 / **782.7**	12.0 / **777.7**
TP-125	789.5	1.5 / **788.0**	1.5 / **788.0**	- / **-**	12.5 / **777.0**
TP-126	761.9	- / **-**	5.8 / **756.1**	- / **-**	12.0 / **749.9**
TP-127	749.0	- / **-**	2.5 / **746.5**	- / **-**	12.0 / **737.0**
TP-128	751.4	- / **-**	3.3 / **748.1**	- / **-**	12.0 / **739.4**

1. Ground surface elevations for 2017 test pits interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017. Ground surface elevations for 2018 test pits provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater observed seeping into the test pit excavation.
3. Infiltrometer test was performed at this location by a LGCI engineer.
4. "-" means layer not encountered.
5. Test pit not performed due to conflict with water line.

Table 2A - Summary of LGCI Borings - Proposed Building
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Asphalt/Concrete Depth / El. (ft.)	Bottom of Topsoil/Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
Borings performed in 2017						
B-1	746.0	3.5 / **742.5**	0.5 / **745.5**	- / -	12.0 / **734.0**	17.0 / **729.0**
B-2	766.0	4.5 / **761.5**	- / -	2.0 / **764.0**	- / -	21.0 / **745.0**
B-3	766.0	1.0 / **765.0**	- / -	0.5 / **765.5**	2.0 / **764.0**	21.0 / **745.0**
B-4	766.0	5.0 / **761.0**	- / -	2.0 / **764.0**	4.0 / **762.0**	21.0 / **745.0**
B-5	766.0	11.5 / **754.5**	- / -	0.4 / **765.6**	8.0 / **758.0**	21.0 / **745.0**
B-6	765.5	2.5 / **763.0**	- / -	2.0 / **763.5**	6.0 / **759.5**	21.0 / **744.5**
Borings performed in 2018						
B-101	764.9	1.7 / **763.2**	- / -	6.0 / **758.9**	- / -	16.0 / **748.9**
B-102	767.0	2.0 / **765.0**	- / -	2.0 / **765.0**	- / -	10.0 / **757.0**
B-103-OW	767.0	8.9 / **758.1**	- / -	2.0 / **765.0**	- / -	17.0 / **750.0**
B-104	767.1	2.2 / **764.9**	- / -	2.0 / **765.1**	- / -	16.0 / **751.1**
B-105	765.2	- / -	- / -	0.6 / **764.6**	6.0 / **759.2**	17.0 / **748.2**
B-106	766.5	1.8 / **764.7**	- / -	0.5 / **766.0**	6.0 / **760.5**	16.0 / **750.5**
B-107	765.9	8.0 / **757.9**	- / -	4.0 / **761.9**	- / -	34.5 / **731.4**
B-108	763.3	6.0 / **757.3**	0.3 / **763.0**	- / -	4.0 / **759.3**	34.1 / **729.2**
B-109	766.7	8.0 / **758.7**	0.2 / **766.5**	- / -	2.0 / **764.7**	36.0 / **730.7**
B-110-OW	765.4	13.7 / **751.7**	- / -	0.4 / **765.0**	4.0 / **761.4**	35.8 / **729.6**
B-111	749.6	- / -	0.3 / **749.3**	- / -	8.0 / **741.6**	15.0 / **734.6**
B-112	748.6	- / -	0.2 / **748.4**	- / -	8.0 / **740.6**	15.0 / **733.6**
B-113[3]	745.7	14.3 / **731.4**	- / -	2.0 / **743.7**	12.0 / **733.7**	14.5 / **731.2**
B-114	745.6	- / -	0.3 / **745.3**	- / -	4.0 / **741.6**	15.0 / **730.6**
B-116	767.4	7.5 / **759.9**	0.3 / **767.1**	- / -	4.0 / **763.4**	39.0 / **728.4**
B-117B[3]	769.5	8.0 / **761.5**	- / -	2.0 / **767.5**	8.0 / **761.5**	41.0 / **728.5**
B-118B-OW[3]	775.0	12.5 / **762.5**	- / -	2.7 / **772.3**	6.0 / **769.0**	41.0 / **734.0**
B-119A[3]	777.7	8.0 / **769.7**	- / -	4.0 / **773.7**	8.0 / **769.7**	41.0 / **736.7**
B-131[3]	749.4	25.1 / **724.3**	0.5 / **748.9**	- / -	12.0 / **737.4**	27.4 / **722.0**

1. Ground surface elevations for 2017 test pits interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017. Ground surface elevations for 2018 borings provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater generally observed at the end of drilling or based on sample moisture. B-5 measured 15 hours after drilling.
3. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
4. "-" means layer not encountered.

Table 2B - Summary of LGCI Test Pits - Proposed Building
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Topsoil / Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Test Pit Depth / El. (ft.)
Test pits performed in 2017					
TP-1	746.5	- / **-**	1.0 / **745.5**	- / **-**	8.0 / **738.5**
TP-2	752.0	- / **-**	0.9 / **751.1**	3.3 / **748.8**	13.0 / **739.0**
TP-3	763.5	9.0 / **754.5**	0.8 / **762.7**	3.2 / **760.3**	9.0 / **754.5**
TP-4	763.0	- / **-**	2.5 / **760.5**	- / **-**	12.5 / **750.5**
TP-5	766.0	- / **-**	2.0 / **764.0**	6.1 / **759.9**	9.5 / **756.5**
TP-6	766.0	- / **-**	0.8 / **765.2**	4.7 / **761.3**	12.3 / **753.7**
TP-7	766.0	- / **-**	1.5 / **764.5**	- / **-**	12.0 / **754.0**
TP-8	766.0	- / **-**	2.1 / **763.9**	- / **-**	10.8 / **755.2**
TP-9	766.0	- / **-**	2.0 / **764.0**	4.0 / **762.0**	12.7 / **753.3**
TP-14	766.0	- / **-**	0.8 / **765.2**	4.0 / **762.0**	10.0 / **756.0**
Test pits performed in 2018					
TP-101[3]	765.9	- / **-**	1.0 / **764.9**	7.0 / **758.9**	13.0 / **752.9**
TP-102	766.4	- / **-**	1.3 / **765.1**	6.0 / **760.4**	12.5 / **753.9**
TP-103	767.0	- / **-**	1.3 / **765.7**	5.0 / **762.0**	12.0 / **755.0**
TP-104	766.0	- / **-**	0.7 / **765.3**	2.0 / **764.0**	12.0 / **754.0**
TP-105[3]	766.0	9.0 / **757.0**	0.8 / **765.2**	5.0 / **761.0**	9.0 / **757.0**
TP-106	766.5	- / **-**	0.9 / **765.6**	2.0 / **764.5**	11.0 / **755.5**
TP-107	767.1	- / **-**	0.7 / **766.4**	1.9 / **765.2**	12.0 / **755.1**
TP-109	767.1	8.8 / **758.3**	0.8 / **766.3**	5.0 / **762.1**	12.0 / **755.1**
TP-110	767.0	- / **-**	1.0 / **766.0**	4.0 / **763.0**	12.0 / **755.0**
TP-111	766.3	- / **-**	0.8 / **765.5**	7.0 / **759.3**	12.0 / **754.3**
TP-112	752.5	3.5 / **749.0**	3.5 / **749.0**	8.0 / **744.5**	8.5 / **744.0**
TP-113	748.0	- / **-**	1.5 / **746.5**	12.0 / **736.0**	14.0 / **734.0**

1. Ground surface elevations for 2017 test pits interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017. Ground surface elevations for 2018 test pits provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater observed seeping into the test pit excavation.
3. Infiltrometer test was performed at this location by a LGCI engineer.
4. "-" means layer not encountered.

Table 3A - Summary of LGCI Borings - Proposed Retaining Wall on Southern Side
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Asphalt/Concrete Depth / El. (ft.)	Bottom of Topsoil/Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
Borings performed in 2018						
B-125[3]	782.8	- / **-**	0.3 / **782.5**	- / **-**	4.0 / **778.8**	17.0 / **765.8**
B-127	788.7	6.1 / **782.6**	- / **-**	- / **-**	- / **-**	26.0 / **762.7**
B-128-OW	790.5	9.4 / **781.1**	- / **-**	6.5 / **784.0**	- / **-**	31.0 / **759.5**
B-129	784.2	8.0 / **776.2**	- / **-**	8.0 / **776.2**	- / **-**	31.0 / **753.2**
B-130	768.5	7.2 / **761.3**	- / **-**	4.0 / **764.5**	- / **-**	30.8 / **737.7**

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater generally observed at the end of drilling or based on sample moisture. B-5 measured 15 hours after drilling.
3. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
4. "-" means layer not encountered.

Table 3B - Summary of LGCI Test Pits - Proposed Retaining Wall on Southern Side
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Topsoil / Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Test Pit Depth / El. (ft.)
Test pits performed in 2018					
TP-119	783.9	1.5 / **782.4**	1.0 / **782.9**	3.0 / **780.9**	12.0 / **771.9**
TP-124	789.7	5.0 / **784.7**	1.0 / **788.7**	7.0 / **782.7**	12.0 / **777.7**
TP-125	789.5	1.5 / **788.0**	1.5 / **788.0**	- / **-**	12.5 / **777.0**

1. Ground surface elevations for 2018 test pits provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater observed seeping into the test pit excavation.
3. "-" means layer not encountered.

Table 4A - Summary of LGCI Borings - Proposed Parking Lots, Driveways, and A
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Asphalt/Concrete Depth / El. (ft.)	Bottom of Topsoil/Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
Borings performed in 2017						
B-7[3]	769.5	3.0 / **766.5**	- / **-**	2.0 / **767.5**	6.0 / **763.5**	16.0 / **753.5**
B-8[3]	783.5	4.0 / **779.5**	0.5 / **783.0**	- / **-**	4.0 / **779.5**	21.0 / **762.5**
Borings performed in 2018						
B-115	741.1	- / **-**	- / **-**	0.4 / **740.7**	16.5 / **724.6**	19.2 / **721.9**
B-120[3]	778.9	9.0 / **769.9**	- / **-**	0.5 / **778.4**	8.0 / **770.9**	46.0 / **732.9**
B-121[3]	774.8	21.0 / **753.8**	0.2 / **774.6**	- / **-**	4.0 / **770.8**	27.0 / **747.8**
B-122[3]	775.8	18.0 / **757.8**	- / **-**	2.0 / **773.8**	16.0 / **759.8**	22.0 / **753.8**
B-123-OW	788.3	18.7 / **769.6**	- / **-**	2.4 / **785.9**	4.0 / **784.3**	22.0 / **766.3**
B-124	784.5	2.5 / **782.0**	- / **-**	0.6 / **783.9**	8.0 / **776.5**	10.8 / **773.7**

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater generally observed at the end of drilling or based on sample moisture. B-5 measured 15 hours after drilling.
3. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26,2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
4. "-" means layer not encountered.

Table 4B - Summary of LGCI Test Pits - Proposed Parking Lots, D
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

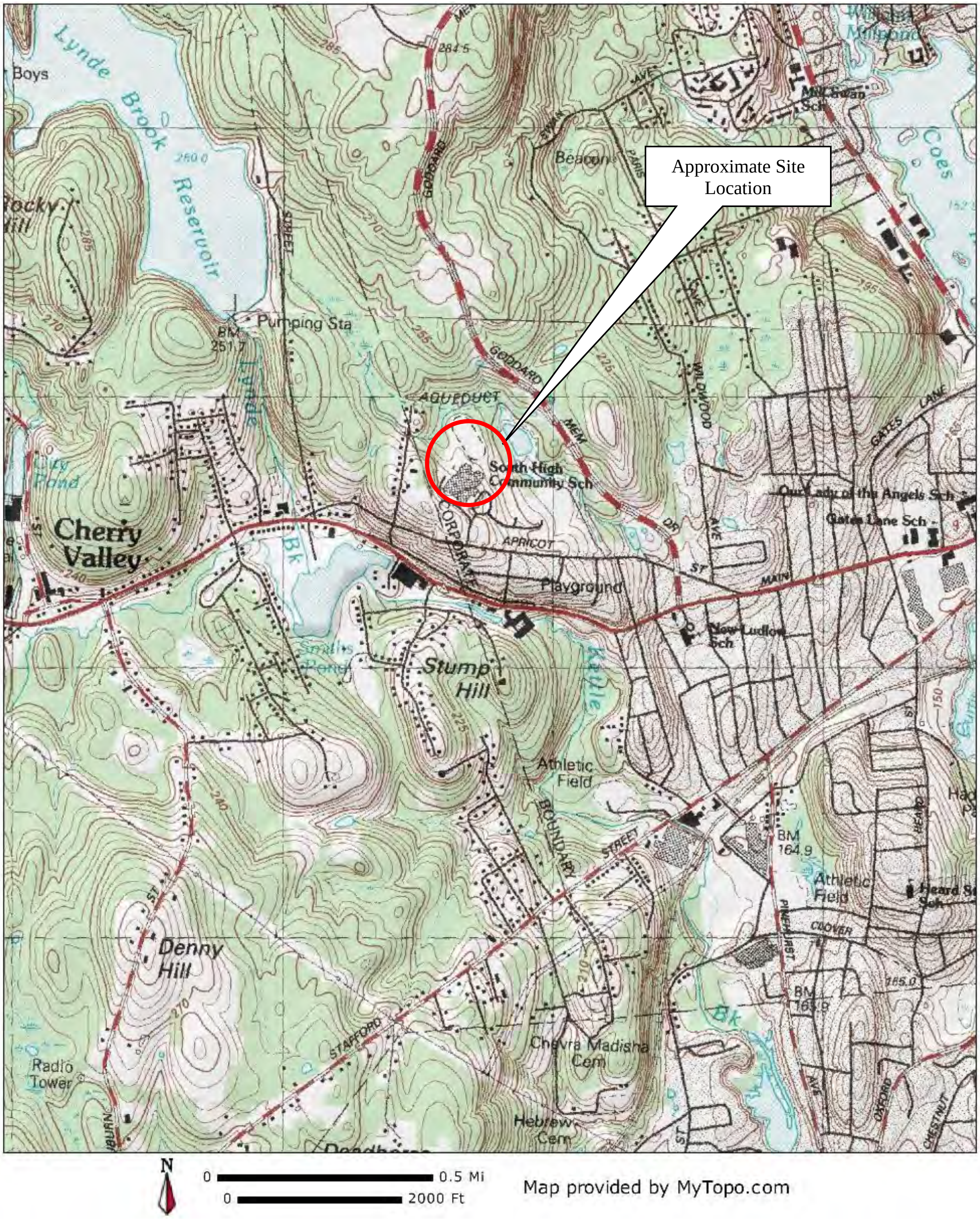
Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Topsoil / Subsoil Depth / El. (ft.)	Bottom of Fill / Buried Organics Depth / El. (ft.)	Bottom of Test Pit Depth / El. (ft.)
Test pits performed in 2017					
TP-10	767.0	8.7 / **758.3**	2.0 / **765.0**	- / **-**	9.8 / **757.2**
TP-11	767.5	- / **-**	0.8 / **766.7**	6.0 / **761.5**	9.4 / **758.1**
TP-12	769.0	- / **-**	0.6 / **768.4**	2.1 / **766.9**	10.0 / **759.0**
TP-13	769.5	10.0 / **759.5**	1.5 / **768.0**	6.5 / **763.0**	10.1 / **759.4**
TP-14	766.0	- / **-**	0.8 / **765.2**	4.0 / **762.0**	10.0 / **756.0**
Test pits performed in 2018					
TP-108	769.0	- / **-**	0.8 / **768.2**	3.5 / **765.5**	12.0 / **757.0**
TP-115[3]	768.7	10.5 / **758.2**	0.8 / **767.9**	3.0 / **765.7**	12.0 / **756.7**
TP-116	-	- / **-**	- / **-**	- / **-**	- / **-**
TP-117	769.7	10.5 / **759.2**	1.0 / **768.7**	3.5 / **766.2**	12.0 / **757.7**
TP-118[3]	774.5	- / **-**	0.5 / **774.0**	9.5 / **765.0**	9.5 / **765.0**
TP-120	786.8	- / **-**	2.5 / **784.3**	5.0 / **781.8**	12.0 / **774.8**
TP-121[3]	784.0	- / **-**	2.0 / **782.0**	3.0 / **781.0**	12.0 / **772.0**
TP-122	784.2	- / **-**	1.5 / **782.7**	8.5 / **775.7**	8.5 / **775.7**
TP-126	761.9	- / **-**	5.8 / **756.1**	- / **-**	12.0 / **749.9**
TP-127	749.0	- / **-**	2.5 / **746.5**	- / **-**	12.0 / **737.0**
TP-128	751.4	- / **-**	3.3 / **748.1**	- / **-**	12.0 / **739.4**

1. Ground surface elevations for 2017 test pits interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017. Ground surface elevations for 2018 test pits provided in a drawing titled: "Boring Location Plan, South High Community Schoc Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Groundwater observed seeping into the test pit excavation.
3. Infiltrometer test was performed at this location by a LGCI engineer.
4. "-" means layer not encountered.

Table 5- Summary of LGCI Groundwater Measurements
Proposed Worcester South High School
Worcester, Massachusetts
LGCI Project No. 1644

Date	B-103-OW[1]	B-110-OW[1]	B-118B-OW[2]	B-123-OW[1]	B-128-OW[1]
	G.S. El.= 767.0 ft.	G.S. El.= 765.4 ft.	G.S. El.= 775.0 ft.	G.S. El.= 788.3 ft.	G.S. El.= 790.5 ft.
	Depth / Elevation (ft.)	**Depth / Elevation (ft.)**	**Depth / Elevation (ft.)**	**Depth / Elevation (ft.)**	**Depth / Elevation (ft.)**
2/14/2018	14.2 / **752.8**	- / **-**	- / **-**	- / **-**	- / **-**
2/15/2018	8.9 / **758.1**	- / **-**	- / **-**	- / **-**	9.4 / **781.1**
2/21/2018	8.7 / **758.3**	- / **-**	- / **-**	- / **-**	11.5 / **779.0**
2/22/2018	8.3 / **758.7**	- / **-**	- / **-**	- / **-**	- / **-**
2/23/2018	- / **-**	- / **-**	- / **-**	8.3 / **780.0**	- / **-**
2/26/2018	6.2 / **760.8**	13.7 / **751.7**	- / **-**	15.0 / **773.3**	11.9 / **778.6**
2/27/2018	6.0 / **761.0**	13.2 / **752.2**	- / **-**	14.9 / **773.4**	11.8 / **778.7**
2/28/2018	5.9 / **761.1**	13.1 / **752.3**	12.8 / **762.2**	14.9 / **773.4**	11.9 / **778.6**
3/1/2018	5.9 / **761.1**	13.2 / **752.2**	12.9 / **762.1**	15.0 / **773.3**	11.8 / **778.7**

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.



Map provided by MyTopo.com

Contour Intervals: 3 meters

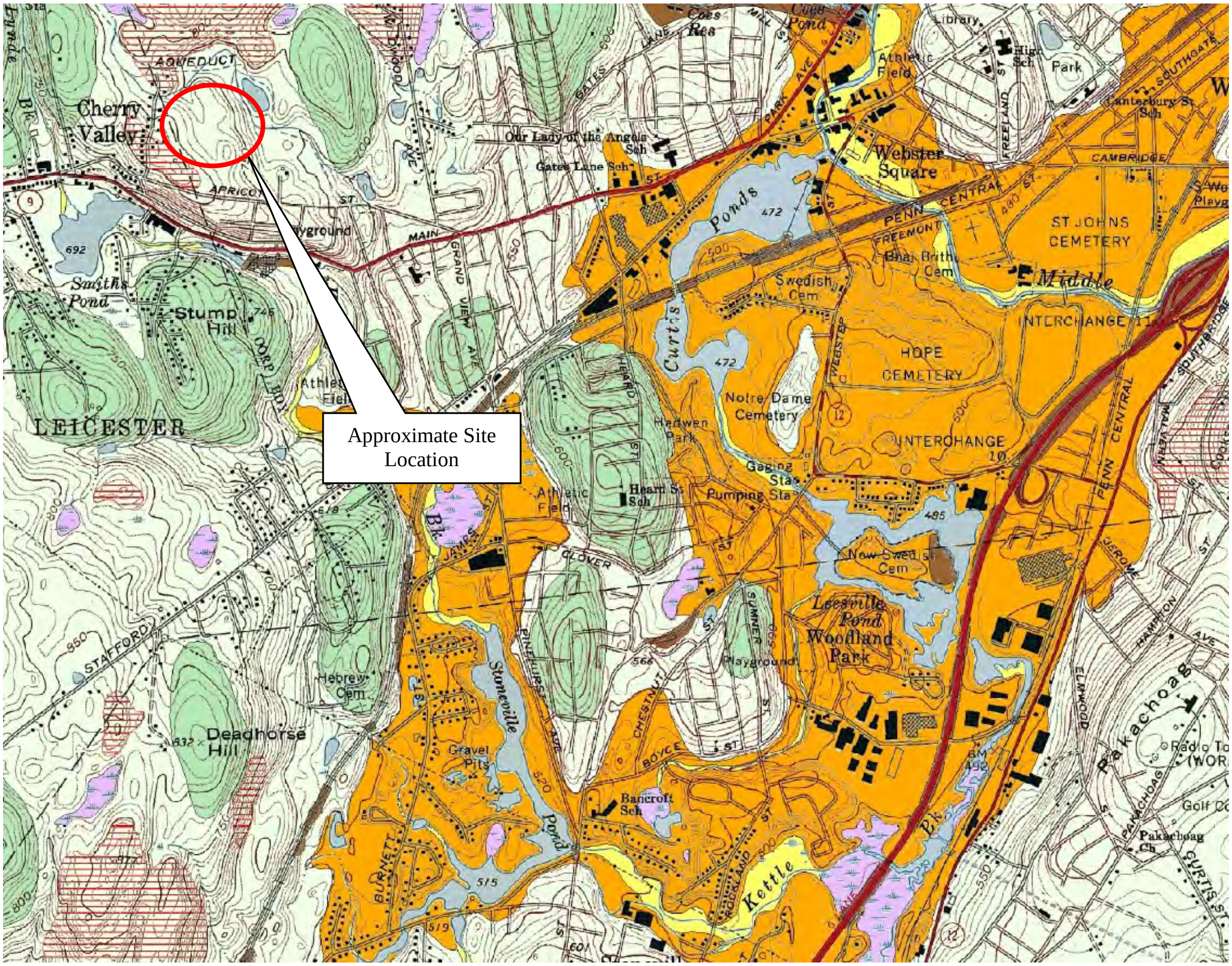
Figure based on USGS topographic map of Worcester, MA obtained from www.mytopo.com/maps

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Worcester South High School	Figure 1 – Site Location Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1644	Date: April 2018

Figure based aerial photograph of site obtained www.google.com/maps

Client:	Project:	
Lamoureux Pagano & Associates, Inc.	Proposed Worcester South High School	Figure 2 – Aerial View of Existing School Site

	Project Location:	LGCI Project No.:	Date:
LGCI Lahlaf Geotechnical Consulting, Inc.	Worcester, MA	1644	April 2018



🟩 **Thin till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered gravel clasts and few large boulders; predominantly upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser-grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer-grained lodgement facies deposited subglacially. Both ablation and lodgement facies of upper till are sandy and stony, and derived from coarse-grained crystalline rocks. Unit includes till of probable Illinoian age beneath eastern Nantucket (Oldale and others, 1982). Beneath Cape Cod, subsurface till overlies fresh, nonweathered bedrock; this basal till varies in known thickness from <5 to >50 ft (Cotton and Koteff, 1962; Masterson and others, 1997; Folger and others, 1978; Hall and others, 1980). Till may overlie Cretaceous, Tertiary, or older Pleistocene deposits beneath the adjacent islands

N

Figure based on map titled: "Surficial Geologic Map of the Worcester South Quadrangle, Massachusetts," prepared by Stone, B.D., Stone, J.R., and DiGiacomo-Cohen, M.L. for U.S. Geological Survey, Open-File Report 2006-1260-D, 2008.

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Worcester South High School	Figure 3 – Surficial Geologic Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1644	Date: April 2018

Legend

▨ Test pits advanced by Northern Drill Service, Inc. (NDS) of Northborough, MA on August 14 and 15, 2017 and observed by LGCI.

⊕ Borings advanced by NDS on August 10 and 11, 2017 and observed by LGCI.

▨ Test pits advanced by NDS between February 12 and 26, 2018 and observed by LGCI. Test Pits designated with "IT" indicates an infiltrometer test was performed by LGCI.

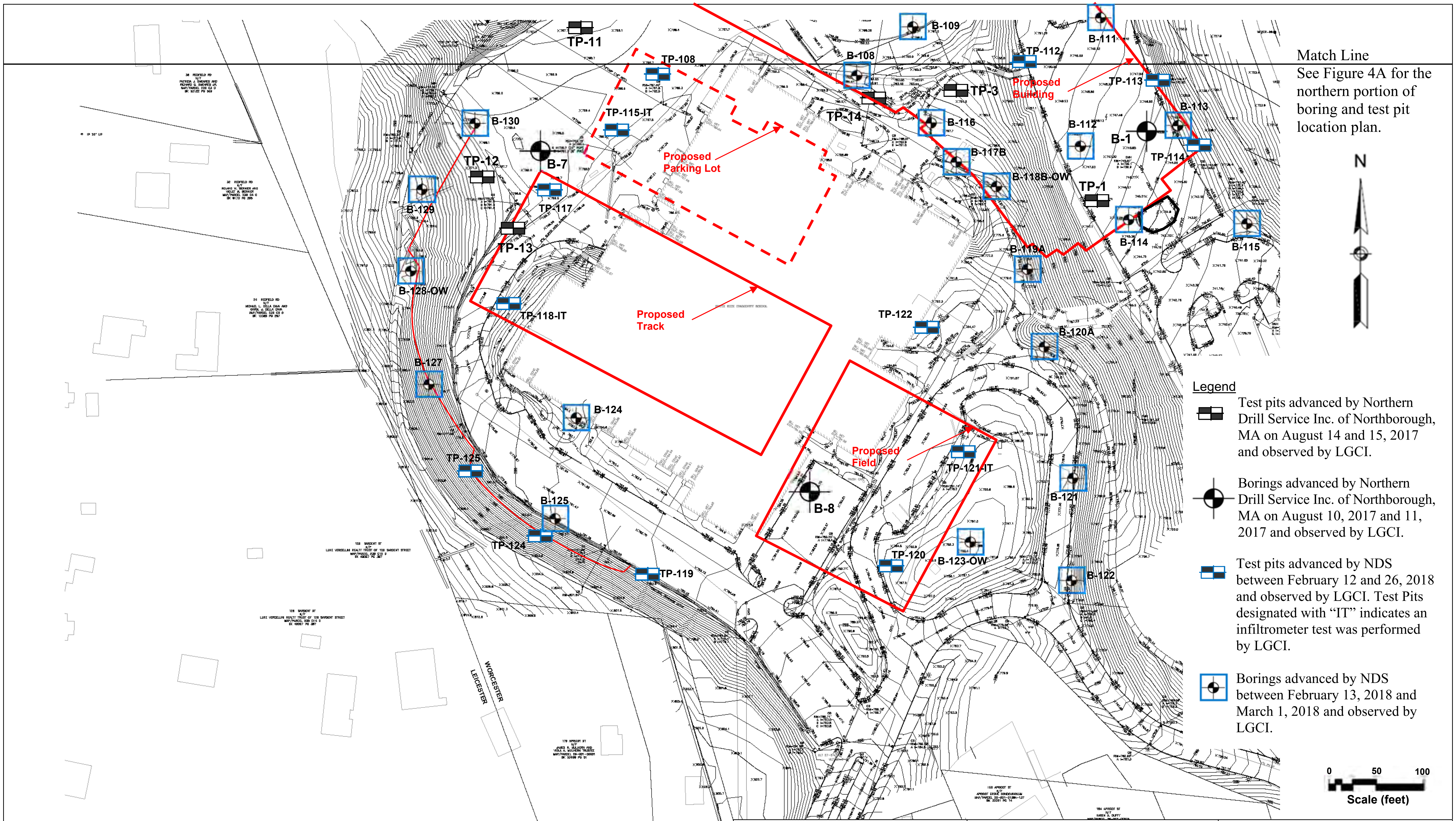
⊕ Borings advanced by NDS between February 13, 2018 and March 1, 2018 and observed by LGCI.

Match Line

See Figure 4B for the southern portion of boring and test pit location plan.

Note: Figure based on progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Worcester South High School	Figure 4A – Boring and Test Pit Location Plan (North)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1644	Date: April 2018



Match Line
See Figure 4A for the northern portion of boring and test pit location plan.

Legend

▣ Test pits advanced by Northern Drill Service Inc. of Northborough, MA on August 14 and 15, 2017 and observed by LGCI.

⊕ Borings advanced by Northern Drill Service Inc. of Northborough, MA on August 10, 2017 and 11, 2017 and observed by LGCI.

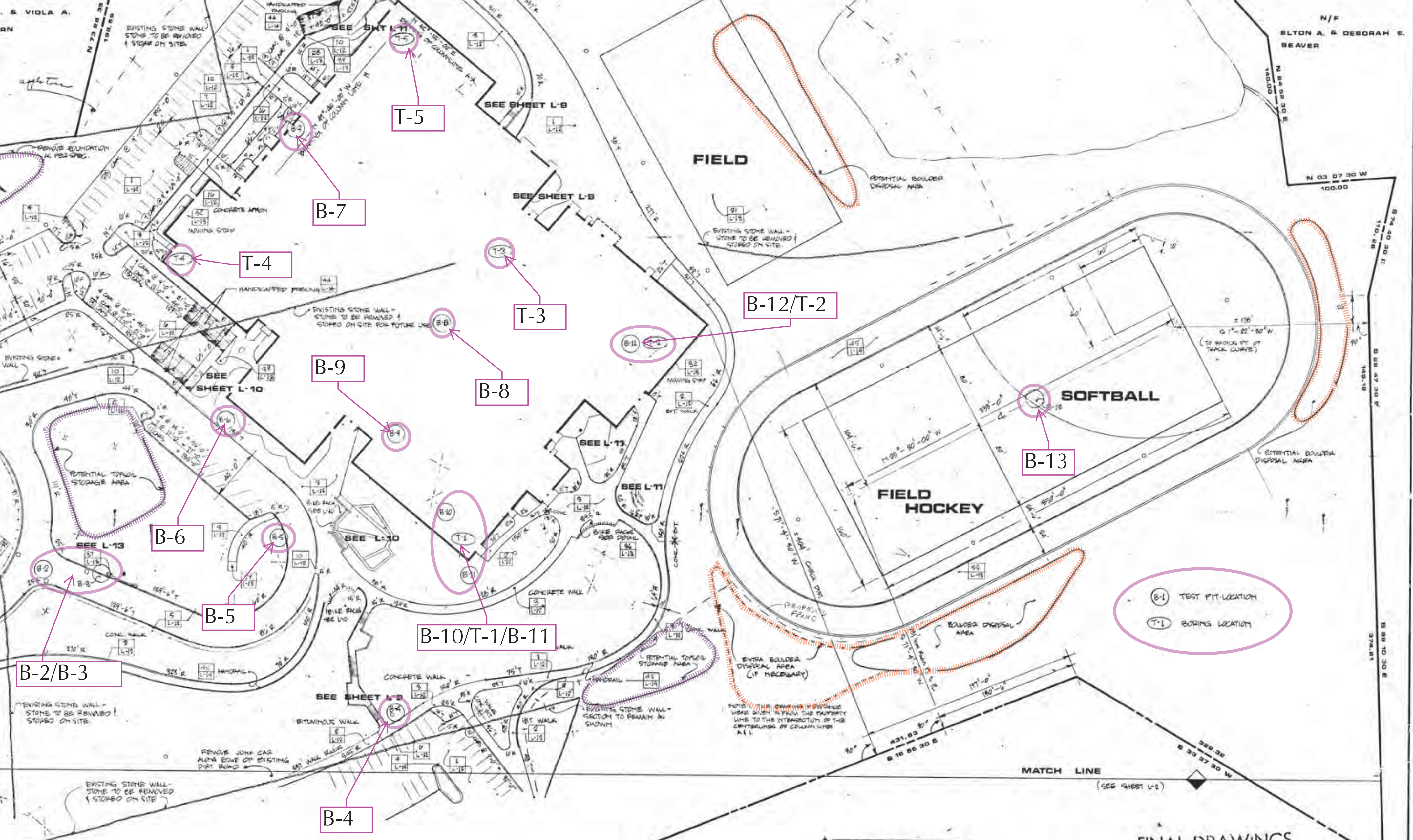
▣ Test pits advanced by NDS between February 12 and 26, 2018 and observed by LGCI. Test Pits designated with “IT” indicates an infiltrometer test was performed by LGCI.

⊕ Borings advanced by NDS between February 13, 2018 and March 1, 2018 and observed by LGCI.

Note: Figure based on progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

Client: Lamoureux Pagano & Associates, Inc.	Project: Proposed Worcester South High School	Figure 4B – Boring and Test Pit Location Plan (South)
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1644
		Date: April 2018

APPENDIX A - Logs of Previous Borings and Test Pits



NOTE: FOR LEGEND AND PERTINENT NOTES SEE SHEET L-2.

ALLEN W. HIXON, JR.

FINAL DRAWINGS

SITE LAYOUT
UPPER SECTION

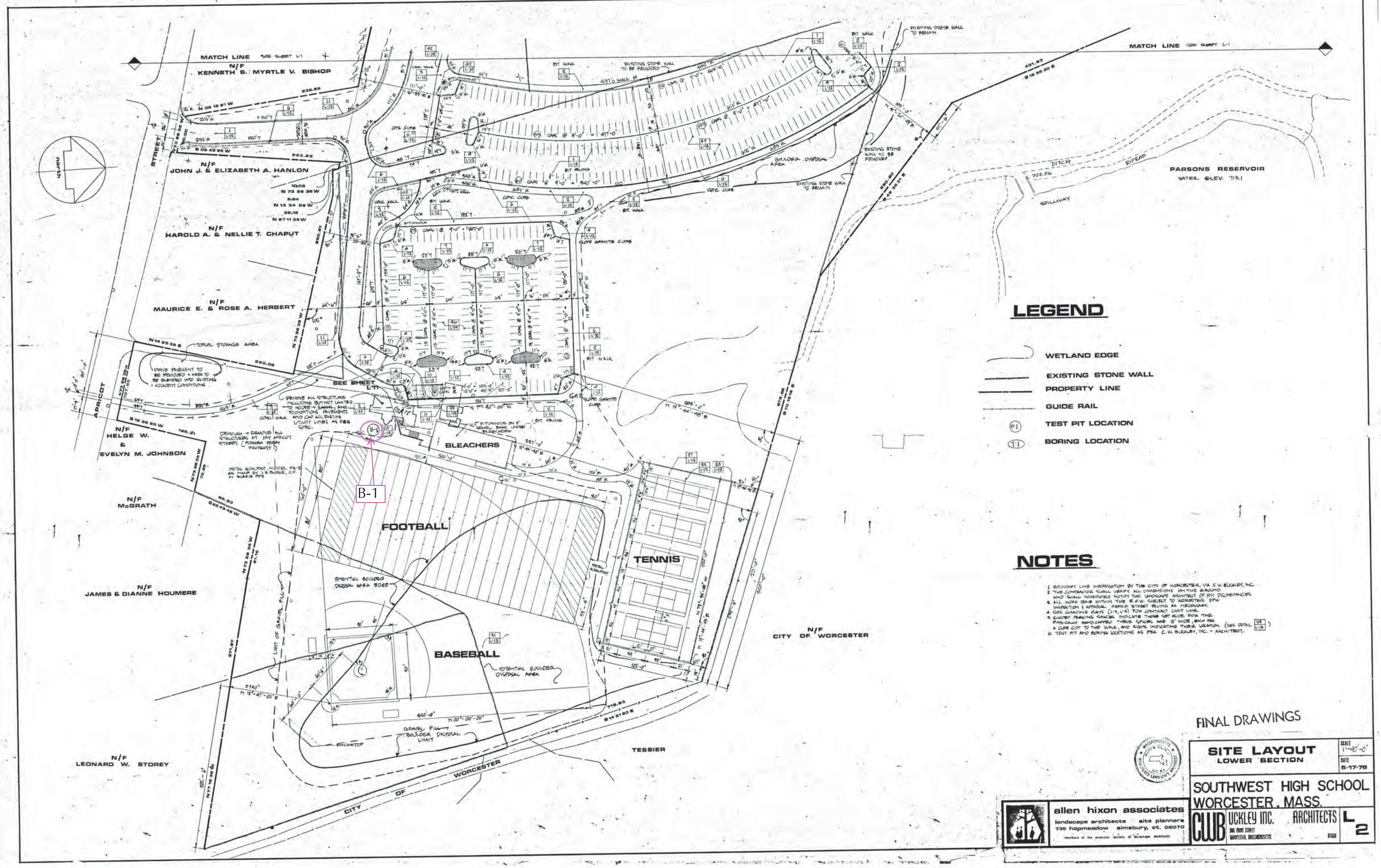
SCALE 1" = 40'-0"
DATE 5-17-76

SOUTHWEST HIGH SCHOOL
WORCESTER, MASS.

allen hixon associates
landscape architects site planners
736 hopmeadow simsbury, ct. 06070
members of the american society of landscape architects

CWB UCKLEY INC. ARCHITECTS
306 MAIN STREET
WORCESTER, MASSACHUSETTS

L-



LEGEND

WETLAND EDGE

EXISTING STONE WALL

PROPERTY LINE

GUIDE RAIL

B-1 TEST PIT LOCATION

T-1 BORING LOCATION

NOTES

1. BOUNDARY LINE INFORMATION BY THE CITY OF WORCESTER, VIA C.W. BUCKLEY, INC.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE GROUND AND SHALL IMMEDIATELY NOTIFY THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES.
3. ALL WORK DONE WITHIN THE R.O.W. SUBJECT TO WORCESTER DPW INSPECTION & APPROVAL. REPAIR STREET PAVING AS NECESSARY.
4. SEE GRADING PLANS (L-3, L-4) FOR CONTRACT LIMIT LINE.
5. SHADED PARKING SPACES INDICATE THOSE SET ASIDE FOR THE PHYSICALLY HANDICAPPED. THESE SPACES ARE 12' WIDE, EACH HAS A CURB CUT TO THE WALK, AND SIGNS INDICATING THEIR LOCATION. (SEE DETAIL 34/L-18)
6. TEST PIT AND BORING LOCATIONS AS PER C.W. BUCKLEY, INC. - ARCHITECT.

FINAL DRAWINGS

NO. 83

SITE LAYOUT
LOWER SECTION

SCALE 1"=40'-0"
DATE 5-17-76

SOUTHWEST HIGH SCHOOL
WORCESTER, MASS.

allen hixon associates
landscape architects site planners
736 hopmeadow simsbury, ct. 06070
members of the american society of landscape architects

CWB UCKLEY INC. ARCHITECTS
306 MAIN STREET
WORCESTER, MASSACHUSETTS 01608

L 2

SECTION 1A

SUBSURFACE EXPLORATION

A. Test boring or soil test information included in the drawings or specifications or otherwise made accessible to the Contractor, was obtained by the Owner for use by the Architect in the design of the building. The Owner does not hold out such information to the Contractor as an accurate or approximate indication of subsurface conditions, and no claim for extra cost or extension of time resulting from a reliance by the Contractor on such information shall be allowed, but if as a result of subsurface conditions discovered in the course of the work, changes in the work are authorized in writing as provided in Article 12 of the General Conditions, adjustments in the Contract Sum shall be made as provided in said Article 12.

B. Test pits were taken on June 19 and 20, 1975 at the Apricot Street site. Test pits were excavated with a backhoe to the depths indicated on the test pit logs.

'est Borings
.25 TAYLOR ROAD

JIL EXPLORATION CORPORATIO
STOW, MASSACHUSETTS 01775

Geological Consulting
(617) 897-8737

'o C. W. Buckley Inc.
Date 11/4/75
Job No. 75-230
.ocation Proposed South-West High School, Apricot St., Worcester, Mass.
Scale 1" = 6 ft.

Test Boring No. T-1
Ground Surface - Elev. 775.1

0"	Loamy topsoil, some root matter.		
1'6"	Very compact, damp to wet, fine to very fine sand with fine to med. gravel, few cobbles and boulders, some silt.		2'
		39	
		56	
WL			4'
			5'
		37	
		74	
			7'
			10'
		39	
		43	12'
13'			

Refusal at 13'
100/1" 300# hammer.
(WL) Water Level 4'
upon completion.

Test Boring No. T-1A moved 12' west
Ground Surface - Elev. 775.3

0"	Topsoil.		
1'	Sandy subsoil.		
2'	Hard to compact, damp fine sand, some med. to coarse gravel, little silt.		2'
		24	
		43	4'
5'WL	Very compact, wet, fine sand, some fine to med. gravel, few cobbles and boulders, little to some silt.		5'
		42	
		47	7'
			10'
		85	
		68	12'
			15'
		91	
		122	17'
18'			

Refusal at 18' 100/0"
300# hammer.
(WL) Water Level 5'
upon completion.

RECEIVED
NOV 7 1975
C. W. BUCKLEY, INC

FILE COPY

Figures in Right Hand Column Indicate the Number of Blows Necessary to Drive spoon 12 inches using 140 lb. weight falling 30 inches.

Casing Data
Casing O.D. 2-3/4" I.D. 2-1/2"
Hammer Fall 24"
Weight of Hammer 300#

Sampler Data
Sampler O.D. 2" I.D. 1-3/8"
Inside Length of Sampler 24"
Hammer Fall 30"
Weight of Hammer 140#

Test Borings
425 TAYLOR ROAD

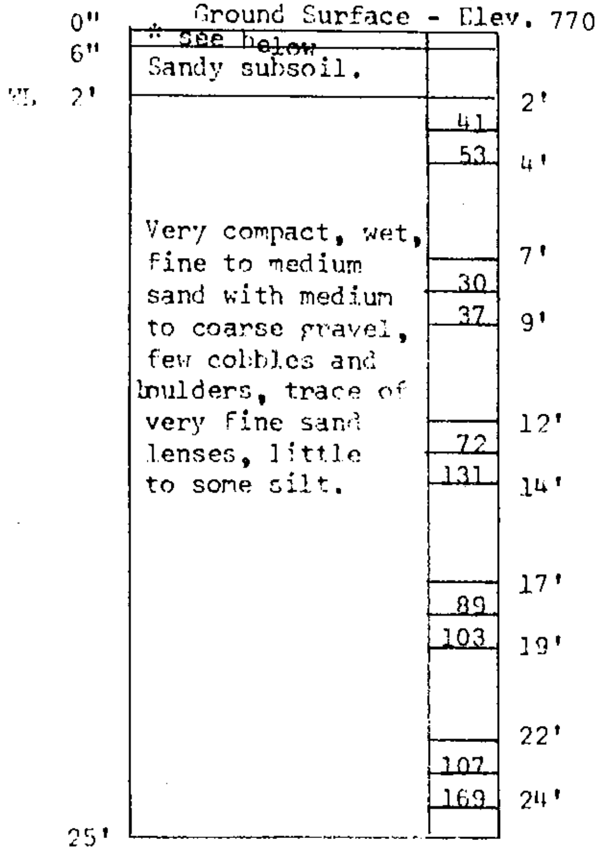
JIL EXPLORATION CORPORATIO
STOW, MASSACHUSETTS 01775

Geological Consulting
(617) 897-8737

To C. W. Buckley Inc. Date 11/4/75 Job No. 75-230

Location Proposed South-West High School, Apricot Street, Worcester, Mass. Scale 1'' = 6 ft.

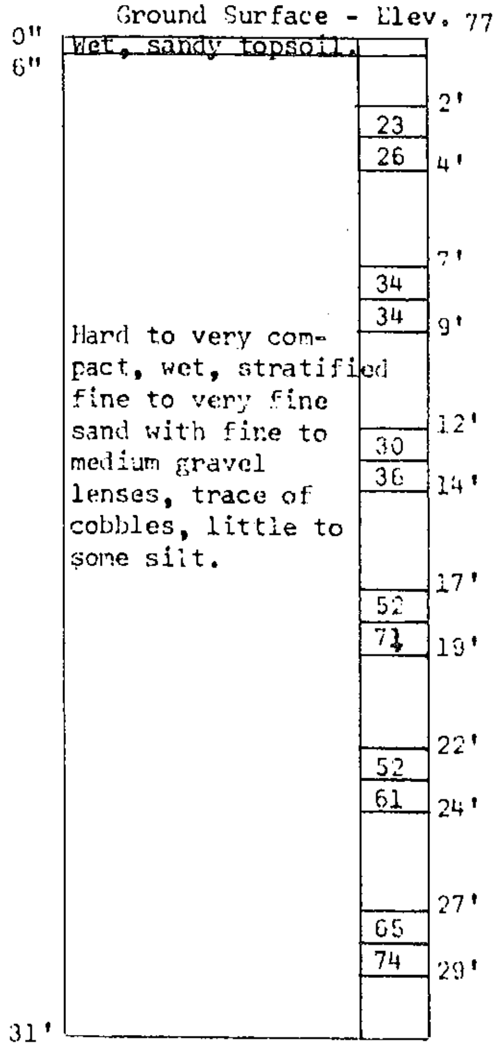
Test Boring No. T-2
Ground Surface - Elev. 770.4



Refusal at 25' 100/2"
300# hammer.
(WL) Water Level 2'
upon completion.

* Loamy topsoil, some root matter, decayed leaves.

Test Boring No. T-3
Ground Surface - Elev. 771.3



Refusal at 31' 100/0"
300# hammer.
Water on ground surface.

RECEIVED
NOV [illegible] 1975
C. W. BUCKLEY, INC.

FILE COPY

Figures in Right Hand Column Indicate the Number of Blows Necessary to Drive spoon 12 inches using 140 lb. weight falling 30 inches.	Casing Data Casing O.D. 2-3/4" I.D. 2-1/2" Hammer Fall 24" Weight of Hammer 300#	Sampler Data Sampler O.D. 2" I.D. 1-3/8" Inside Length of Sampler 24" Hammer Fall 30" Weight of Hammer 140#

est Borings
25 TAYLOR ROAD

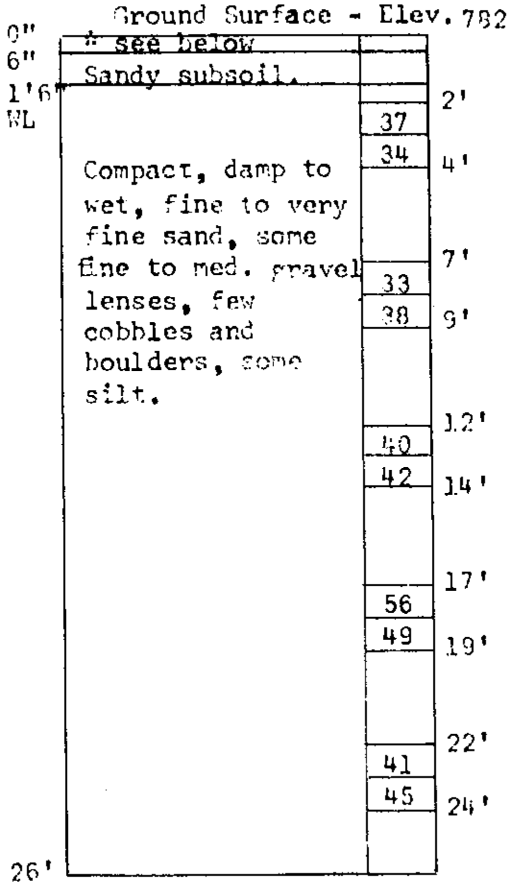
JIL EXPLORATION CORPORATIO
STOW, MASSACHUSETTS 01775

Geological Consulting
(617) 897-8737

o C. W. Buckley Inc. Date 11/5/75 Job No. 75-230

ocation Proposed South-West High School, Spricot Street, Scale 1" = 6 ft.
Worcester, Mass.

Test Boring No. T-4
Ground Surface - Elev. 782.8

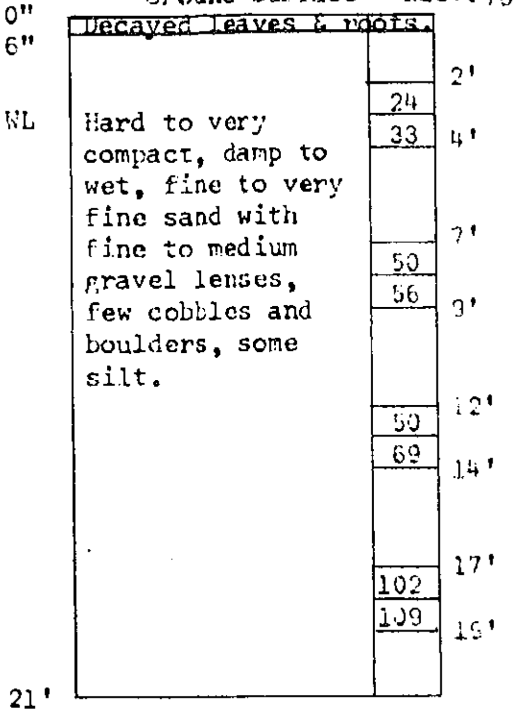


Compact, damp to wet, fine to very fine sand, some fine to med. gravel lenses, few cobbles and boulders, some silt.

Refusal at 26' 100/2"
300# hammer.
(WL) Water Level 2'
upon completion.

* Decayed leaves and root matter.

Test Boring No. T-5
Ground Surface - Elev. 781.4



Hard to very compact, damp to wet, fine to very fine sand with fine to medium gravel lenses, few cobbles and boulders, some silt.

Refusal at 21' 90/0"
300# hammer.
(WL) Water Level 3'
upon completion.

Figures in Right Hand Column Indicate the Number of Blows Necessary to Drive spoon 12 inches using 140 lb. weight falling 30 inches.	Casing Data Casing O.D. 2-3/4" I.D. 2-1/2" Hammer Fall 24" Weight of Hammer 300#	Sampler Data Sampler O.D. 2" I.D. 1-3/8" Inside Length of Sampler 24" Hammer Fall 30" Weight of Hammer 140#

TEST PIT REPORT

B-1

0 Some loam, roots,
surface water

6"
Stones, fine sand, silt
some clay, like hardpan

5'
Sandier than above, damp

7' No refusal, no water

B-2

0 Some loam, roots

6"

Yellow subsoil

2'
Stones, and small boulders,
fine to very fine sand,
some silt, gravelly and
tightly packed

7' No refusal, no water

B-3

0 Some loam, roots

6"
Yellow subsoil

2'

Material same as B-3

14' No refusal, no water
but damp

B-4

0

Some loam & roots

6"

Yellow subsoil

3'

Grey fine sane, some silt
stones & flat boulders, damp

6' No refusal, no water

B-5

0
Some loam & roots
6"

Yellow subsoil

2'

Grey fine sand and gravel,
some silt, some stones
tightly packed

14' No refusal, no water

B-6

0
Some loam & roots
6"

Yellow subsoil

2'

Grey fine sand and gravel,
some silt and stones

8' Water trickling in

11'-6" Water, refusal (apparently
large boulders)

TEST PIT REPORT

B-7

0

Some loam & roots
surface boulders

6"

Yellow subsoil

2'

Similar to B-1

11' No refusal, no water,
some boulders

B-8

0

Roots & some loam

6"

Yellow subsoil

2'

Material similar to B-5

4' Water seeping in

8' No refusal, wet

B-9

0

Roots & some loam

6"

Yellow subsoil

2'

Material similar to B-5

10' Water trickling in

12' No refusal, wet

B-10

0

Some loam, roots, large
surface boulders

6"

Material similar to B-5

12'-6" No refusal, dry

B-11

0

Some loam & roots

6"

Material similar to B-5

6' No refusal, dry

B-12

0

Roots, stones, wet, very
little soil

1'

Stone, some sand & silt,
wet

3' water surface

5' Stones & gravel, fines
washed away. Bottom appears
firm when probed.

TEST PIT REPORT

B-13

0 Roots, some loam, surface boulders

6"

Sand & gravel, few fines, dry, some stones

8'

Fine sand & gravel, some silt damp.

10' No refusal, no water

APPENDIX B - Logs of LGCI’s Borings

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-1
Page 1 of 1

Project: **Proposed Worcester South High School, MA**
Client: **Lamoureux Pagano & Associates, Inc.**
LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/11/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/11/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Eastern side of lower parking lot
Ground Surface El:	746' (See remark 1)	Total Depth:	17'
Groundwater Depth:	3.5' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		6	18	13	18	8		Asphalt	0 - 6": Asphalt
										Fill	S1 - Top 3": Well graded SAND with Gravel (SW), fine to coarse, ~15% fine gravel, dark brown, moist Bottom 5": Silty SAND with Gravel (SM), fine to medium, trace coarse, ~20% fines, ~20% fine gravel, light brown, wet
	2-4	S2	15	12	11	8	24	7			S2 - Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 10-15% fine gravel, light brown, wet
5ft	4-6	S3	9	17	14	12	24	12			S3 - Silty SAND with Gravel (SM), fine, ~20% fines, 10-15% fine gravel, trace of roots, olive green, wet
	6-8	S4	18	11	31	24	24	6			S4 - Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~25% fine gravel, olive green, wet
10ft									2	~10'	
	10-12	S5	22	7	13	25	24	5		Buried Organics ~12'	S5 - Silty SAND with Gravel (SM), slightly plastic, fine to medium, ~25% fines, ~30% fine to coarse gravel, thin layer of peaty organic fines, gray to dark brown, wet
15ft										Silty Sand with Gravel	
	15-17	S6	19	29	50	22	24	10		~17'	S6- Silty SAND with Gravel (SM), fine, ~25% fines, 15-20% fine gravel, gray, wet
											Bottom of boring at 17'. Backfilled with drill cuttings. Ground surface restored with cold asphalt patch.
20ft											

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Open hole drive and wash techniques starting at 9'.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-2
Page 1 of 1

Project:	**Proposed Worcester South High School, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/10/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/10/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Southwestern corner of track
Ground Surface El:	766' (See remark 1)	Total Depth:	21'
Groundwater Depth:	4.5' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	3	7	7	24	14		Topsoil/ Subsoil ~2'	S1 - Top 8": Silty SAND (SM), fine, ~35% fines, trace gravel, trace of organics, roots, grass, dark brown, moist Bottom 6": Well graded SAND with Silt and Gravel (SW-SM), fine to medium, 5-10% fines, ~10% fine gravel, brown, moist
	2-4	S2	9	16	15	15	24	18	2		S2 - Silty SAND with Gravel (SM), fine, 20-25% fines, ~10% fine gravel, light brown, moist
5ft	4-6	S3	16	47	43	46	24	17			S3 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown, wet
	6-8	S4	51	53	54	58	24	14			S4 - Similar to S3
10ft	9-11	S5	27	42	55	72	24	17		Silty Sand with Gravel	S5 - Silty SAND with Gravel (SM), fine, 15-20% fines, 15-20% fine gravel, light brown, wet
15ft	14-16	S6	23	66	64	100/5	23	18			S6 - Silty SAND with Gravel (SM), fines, 15-20% fines, ~20% fine gravel, light brown, wet
20ft	19-21	S7	29	66	60	96	24	20		~21'	S7 - Silty SAND with Gravel (SM), fine, ~15% fines, ~10% fine gravel, gray, wet
											Bottom of boring at 21'. Backfilled with drill cuttings.

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Open hole drive and wash techniques starting at 4'.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-3
Page 1 of 1

Project:	**Proposed Worcester South High School, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/11/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/11/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Southwestern corner of track
Ground Surface El:	766' (See remark 1)	Total Depth:	21'
Groundwater Depth:	1' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	2	29	32	10	24	13		Topsoil Fill ~2'	S1 - Top 6": Silty SAND (SM), fine, ~30% fines, trace fine gravel, trace of organics, roots, grass, dark brown, moist Bottom 7": Silty SAND (SM), fine, trace coarse, ~15% fines, trace fine gravel, trace root hairs, fragments of crushed rock
	2-4	S2	15	17	16	17	24	17			S2 - Poorly graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, ~15% fine gravel, light brown, moist
									2		
5ft	4-6	S3	47	26	14	17	24	11	3		S3 - Silty SAND with Gravel (SM), fine to medium, 15-20% plastic fines, 10-15% fine gravel, light brown, wet
10ft	9-11	S4	15	37	46	51	24	16		Silty Sand with Gravel	S4 - Silty SAND with Gravel (SM), fine, ~20% fines, ~20% fine gravel, light brown, wet
15ft	14-16	S5	23	43	64	73	24	15			S5 - Similar to S4
20ft	19-21	S6	30	59	48	61	24	19		~21'	S6 - Similar to S4, gray
											Bottom of boring at 21'. Backfilled with drill cuttings.

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Open hole drive and wash techniques starting at 4'.
3. Encountered boulder while sampling. Split spoon sampler bent.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-4
Page 1 of 1

Project:	**Proposed Worcester South High School, MA**
Client:	**Lamoureux Pagano & Associates, Inc.**
LGCI Project No.:	1644

Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/10/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/10/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Eastern side of track
Ground Surface El:	766' (See remark 1)	Total Depth:	21'
Groundwater Depth:	5' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	2	7	10	9	24	15		Topsoil Subsoil ~2'	S1 - Top 6": Silty SAND (SM), fine, ~35% fines, trace fine gravel, organics, roots, grass, dark brown, moist Bottom 9": Silty SAND (SM), ~15% fines, trace fine gravel, light brown, moist
	2-4	S2	9	11	9	7	24	13		Fill ~4'	S2 - Silty SAND (SM), 10-15% fines, trace fine gravel, light brown, moist
5ft	4-6	S3	47	20	16	14	24	7			S3 - Poorly graded SAND with Silt and Gravel (SP-SM), fine to medium, ~15% fines, 10-15% fine gravel, light brown, moist
	6-8	S4	18	16	13	9	24	11			S4 - Similar to S3
10ft	9-11	S5	10	12	15	16	24	8			S5 - Silty SAND with Gravel (SM), fine, ~10% fines, 10-15% fine gravel, light brown, wet
									2	Silty Sand with Gravel	
15ft	14-16	S6	49	23	17	15	24	12			S6 - Well graded SAND with Silt and Gravel (SW), fine, ~10% fines, ~10% fine gravel, light brown, wet
20ft	19-21	S7	13	16	20	27	24	14		~21'	S7 - Well graded SAND with Silt and Gravel (SM), fine, 10-15% fines, ~10% fine gravel, light brown, wet
											Bottom of boring at 21'. Backfilled with drill cuttings.

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Open hole drive and wash techniques starting at 14'.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-5
Page 1 of 1

Project:	**Proposed Worcester South High School, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/10/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/11/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Western side of track
Ground Surface El:	766' (See remark 1)	Total Depth:	21'
Groundwater Depth:	2.5' at end of drilling, 11.5' 15 hrs after end of drilling	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	2	7	12	15	24	13		Topsoil Fill ~4'	S1- Top 5": Silty SAND (SM), fine, ~35% fines, trace of organics, roots, grass, dark brown, moist Bottom 8": Poorly graded SAND with Gravel (SP), fine to medium, ~15% fine gravel, light brown, moist
	2-4	S2	6	11	12	8	24	7			S2- Silty GRAVEL with Sand (GM), fine, ~20-25% fines, ~30% fine to coarse sand, light brown, moist
5ft	4-6	S3	4	4	15	21	24	11		Buried Organics ~8'	S3- Top 5": Silty SAND (SM), fine, ~30% organic fines, fibrous peat, roots, dark brown to brown, wet Bottom 6": Silty SAND with Gravel (SM), fine to medium, ~20% fines, trace of organics, roots, brown, wet
	6-8	S4	15	11	26	25	24	8			S4- Top 0.5": Similar to bottom 6" of S3 Bottom 7.5": Silty SAND with Gravel (SM), fine, ~25% fines, ~5% fine gravel, trace organics, roots, brown, wet
10ft	9-11	S5	14	26	32	36	24	13		**Silty Sand with Gravel**	S5- Silty SAND with Gravel (SM), fine, ~15-20% fines, ~10% fine gravel, light brown, wet
15ft	14-16	S6	18	15	14	18	24	12			S6- Similar to S5
20ft	19-21	S7	20	22	38	42	24	14		~21'	S7- Similar to S5
											Bottom of boring at 21'. Backfilled with drill cuttings.

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-6
Page 1 of 1

Project:	**Proposed Worcester South High School, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/10/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/10/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Northeastern corner of track
Ground Surface El:	765.5' (See remark 1)	Total Depth:	21'
Groundwater Depth:	2.5' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	2	6	7	8	24	17		Topsoil Subsoil ~2'	S1- Top 7": Silty SAND with Gravel (SM), fine, ~35% fines, ~15% fine gravel, trace of organics, roots, grass, dark brown, moist Bottom 10": Silty SAND (SM), fine, 10-15% fines, trace gravel, light brown, moist
	2-4	S2	9	11	22	50/5	23	16	2	Fill	S2- Silty SAND with Gravel (SM), fine, 10-15% fines, ~20% fine gravel, light brown, moist
5ft	4-6	S3	103/5				5	3	3	~6'	S3- Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~15% fine gravel, trace of organics, roots, light brown, moist
	6-8	S4	10	18	25	30	24	11		Silty Sand with Gravel	S4- Well graded SAND with Silt and Gravel (SW-SM), fine to medium, 5-10% fines, 15-20% fine gravel, light brown, moist
10ft	9-11	S5	19	22	19	28	24	14			S5- Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% fine gravel, light brown, moist
									4		
15ft	14-16	S6	14	43	55/2		14	10			S6- Similar to S5
20ft	19-21	S7	13	37	44	82	24	12		~21'	S7- Similar to S5
											Bottom of boring at 21'. Backfilled with drill cuttings.

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered boulder while sampling. Open hole drive and wash techniques starting at 4'.
3. Split spoon sampler bent. Drilled through ~1.5' boulder.
4. Encountered boulder at 12'.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-7
Page 1 of 1

Project: **Proposed Worcester South High School, MA**
Client: **Lamoureux Pagano & Associates, Inc.**
LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/11/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/11/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Athletic field NW of existing building
Ground Surface El:	769.5' (See remark 1)	Total Depth:	16'
Groundwater Depth:	3' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	3	11	8	23	24	13		Topsoil Subsoil ~2'	S1- Top 5": Silty SAND (SM), fine, ~35% fines, trace of organics, roots, grass, dark brown, moist Bottom 8": Poorly graded SAND with Silt & Gravel (SP-SM), fine to medium, ~10% fines, ~20% fine gravel, light brown, moist
	2-4	S2	22	22	19	15	24	20		Fill	S2- Silty GRAVEL with Sand (GM), fine, ~40% fines, ~30% fine to coarse sand, brown, moist
5ft	4-6	S3	7	9	19	31	24	15	2	~6'	S3- Top 6": Silty SAND (SM), fine, ~20% fines, ~40% organic fines, dark gray, wet Bottom 9": Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~20% fine gravel, thin layers up to 1/8" peat, brown, wet
	6-8	S4	31	43	51	48	24	14			S4- Well graded SAND with Silt and Gravel (SW-SM), fine to medium, ~10% fines, ~20% fine gravel, brown, wet
10ft	9-11	S5	13	19	16	16	24	8		Silty Sand with Gravel	S5- Silty SAND with Gravel (SM), fine to coarse, ~15% fines, ~15% fine gravel, light brown, wet
15ft	14-16	S6	13	13	15	13	24	8		~16'	S6- Similar to S5, ~20% fines
											Bottom of boring at 16'. Backfilled with drill cuttings.
20ft											

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Open hole drive and wash techniques starting at 4'.

LGCI
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BORING LOG

Boring B-8
Page 1 of 1

Project:	**Proposed Worcester South High School, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Drilling Subcontractor:	Northern Drill Serives	Date Started:	8/11/2017
Drilling Foreman:	Tim Tucker	Date Completed:	8/11/2017
LGCI Engineer:	Hadi Kazemiroodsari	Location:	South of existing building
Ground Surface El:	783.5' (See remark 1)	Total Depth:	21'
Groundwater Depth:	4' upon completion of boring	Drill Rig Type:	Mobile Drill B-48 ATV
		Drilling Method:	Drive and wash casing 4"
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		10	12	21	18	6		Asphalt	0 - 6": Asphalt
										Fill	S1- Poorly graded SAND with Gravel (SP), medium to coarse, ~25% fine gravel, dark brown to gray, moist
	2-4	S2	41	14	11	10	24	11		~4'	S2- Silty SAND (SM), fine to medium, trace coarse, 40-45% fines, 10-15% fine gravel, light brown, moist
5ft	4-6	S3	4	9	31	28	24	9		Silty Sand with Gravel	S3- Silty SAND with Gravel (SM), fine, 30-355% fines, ~30% fine gravel, gray, wet
	6-8	S4	20	11	11	14	24	11			S4- Silty SAND with Gravel (SM), fine, 30-35% fines, ~30% fine gravel, light brown, wet
10ft	9-11	S5	12	30	26	16	24	8	2		S5- Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~20% fine gravel, light brown, wet
									3		
15ft	14-16	S6	19	23	19	37	24	13			S6- Well graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, ~10% fines 15-20% fine gravel, light brown, wet
20ft	19-21	S7	16	13	8	11	24	7		~21'	S7- Similar to S6
											Bottom of boring at 21'. Backfilled with drill cuttings. Ground surface restored with cold asphalt patch.

Remarks:
1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Open hole drive and wash techniques starting at 9'.
3. Encountered boulder at 12'.

LGCI
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BORING LOG

Boring B-101
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/13/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/13/2018
LGCI Engineer:	Tom Sinnott	Location:	Western edge of northern athletic field
Ground Surface El:	764.9 feet (see remark 1)	Total Depth:	16 feet
Groundwater Depth:	~1.7 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	2	4	7	6	24	10		Topsoil	S1 - Top 5": Silty SAND (SM), fine, ~25% fines, trace fine gravel, trace organic fines, trace roots, dark brown, moist
											Bot. 5": Silty SAND with Gravel (SM), fine, ~20% fines, ~15% fine gravel, trace roots, brown, moist
	2-4	S2	3	5	5	3	24	9		Subsoil	S2 - Silty SAND (SM), fine, 10-15% fines, trace fine gravel, brown, moist
5ft	4-6	S3	6	3	3	5	24	0			S3 - No recovery
										~6 ft.	
	6-8	S4	14	12	17	20	24	9			S4 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, light brown, moist
									2		
	8-10	S5	25	35	38	47	24	12			S5 - Silty SAND (SM), fine, trace medium, 15-20% fines, 5-10% fine gravel, light brown, wet
10ft											
										Sand	
15ft	14-16	S6	17	27	32	31	24	20			S6 - Silty SAND (SM), fine, ~25% fines, ~5% fine gravel, light brown, wet
										~16 ft.	
											Bottom of boring at 16 feet. Backfilled borehole with drill cuttings.
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Open hole drive and wash techniques used at 8 feet.

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BORING LOG

Boring B-102
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/13/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/13/2018
LGCI Engineer:	Tom Sinnott	Location:	SW corner of northern athletic field
Ground Surface El:	767 feet (see remark 1)	Total Depth:	10 feet
Groundwater Depth:	~2 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	11	6	10	14	24	21		Topsoil ~1.3 ft.	S1 - Top 15": Silty SAND (SM), fine, ~25% fines, trace organic fines, trace roots, dark brown, moist
										Subsoil	Bot. 6": Silty SAND with Gravel (SM), fine, trace medium, ~15% fines, ~15% fine angular gravel, brown, wet
	2-4	S2	24	21	21	23	24	19			
									2		S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, ~10% fines, 15-20% fine gravel, light brown, moist
5ft	4-6	S3	17	17	19	20	24	13			S3 - Similar to S2
										Sand	
	6-8	S4	15	16	27	32	24	14			S4 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown, moist
	8-10	S5	17	27	30	31	24	15			S5 - Similar to S4
10ft										~10 ft.	
											Bottom of boring at 10 feet. Backfilled borehole with drill cuttings.
15ft											
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Open hole drive and wash techniques used at 4 feet.

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BORING LOG

Boring B-103-OW
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/13/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/14/2018
LGCI Engineer:	Tom Sinnott	Location:	Northern athletic field
Ground Surface El:	767 feet (see remark 1)	Total Depth:	17 feet
Groundwater Depth:	~14.2 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
	~8.9 ft. 31 hrs. after installation	Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	8	8	9	12	24	18		Topsoil	S1 - Top 10": Silty SAND (SM), fine, 20-25% fines, 5-10% fine gravel, trace organic fines, trace roots, dark brown, moist
										Subsoil ~2 ft.	Bot. 8": Silty SAND (SM), fine, ~20% fines, trace roots, brown, moist
	2-4	S2	13	14	20	58	24	16		Sand	S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, 5-10% fines, 20-25% fine gravel, angular stone fragments, light brown, moist
5ft	4-6	S3	43	47	50	47	24	21			S3 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace fine angular gravel, light brown, moist
	6-8	S4	45	63	60/4		16	16			S4 - Silty SAND (SM), fine, 15-20% fines, trace fine angular gravel, light brown, moist
10ft											
	10-12	S5	30	29	34	60	24	18			S5 - Silty SAND (SM), fine, 20-25% fines, ~5% fine gravel, light brown, wet
15ft											
	15-17	S6	27	66	55	62	24	19			S6 - Similar to S5, ~20% fines
										~17 ft.	
											Bottom of boring at 17 feet. Installed groundwater observation well.
20ft											

Remarks:

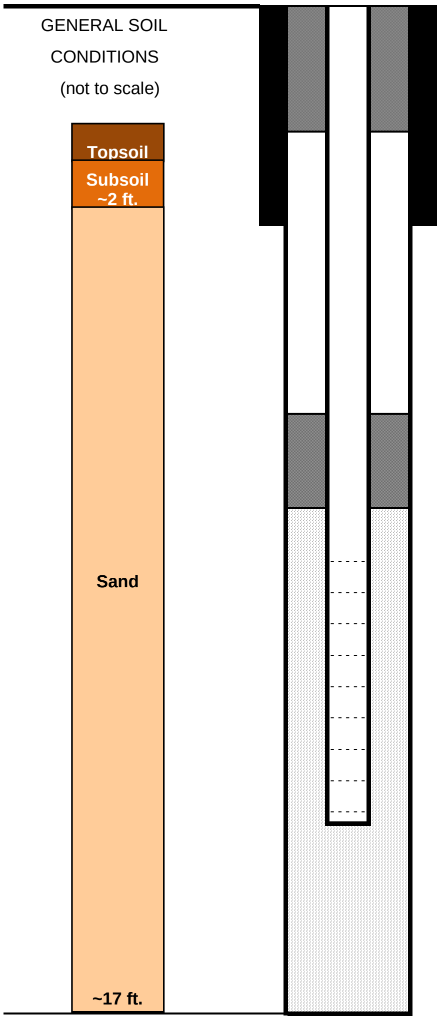
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-103-OW**

Page 1/1

Project Name:	**Proposed Worcester South High School, Worcester, Massachusetts**		
LGCI Project Number:	**1644**		
Client:	**Lamoureux Pagano & Associates, Inc.**		
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/14/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/14/2018
LGCI Engineer:	Tom Sinnott	Location:	Northern athletic field
Ground Surface Elevation:	767 feet (see remark 1)	Total Depth of Boring:	17 feet
Ground Water Depth:	~14.2 ft. at end of installtion ~8.9 ft. 31 hours after installation	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)



Riser Stickup ~0' above ground surface

THICKNESS OF SURFACE SEAL	4 inch
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Aluminum road box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Holliston sand
DEPTH TO TOP OF SEAL	1.5 feet
TYPE OF SEAL	Bentonite chips
DEPTH TO BOTTOM OF SEAL	3.5 feet
DEPTH TO TOP OF PERVIOUS SECTION	5 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Holliston sand
DEPTH TO BOTTOM OF PERVIOUS SECTION	15 feet
DEPTH TO BOTTOM OF SAND COLUMN	17 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Holliston sand
DIAMETER OF BOREHOLE	9 inch
DEPTH TO BOTTOM OF BOREHOLE	17 feet

Remarks: 1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

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BORING LOG

Boring B-104
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/13/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/13/2018
LGCI Engineer:	Tom Sinnott	Location:	Northern athletic field
Ground Surface El:	767.1 feet (see remark 1)	Total Depth:	16 feet
Groundwater Depth:	~2.2 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches				Pen (in)	Rec (in)	Remarks	Strata	Sample Description
			0-6	6-12	12-18	18-24					
	0-2	S1	15	12	24	13	24	15		Topsoil Subsoil ~2 ft.	S1 - Top 8": Silty SAND with Gravel (SM), fine, ~20% fines, ~25% fine gravel, trace organic fines, trace roots, angular stone fragments, dark brown, moist Bot. 7": Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace roots, brown, moist
	2-4	S2	19	70/4			10	10	2	Sand	S2 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, 5-10% fine gravel, light brown, moist
									3		
5ft	4-6	S3	13	12	14	12	24	18	4		S3 - Silty SAND with Gravel (SM), fine, ~15% fines, ~15% fine gravel, light brown, moist
	6-8	S4	14	12	12	15	24	17			S4 - Similar to S3
	8-10	S5	11	18	40	35	24	12			S5 - Silty SAND (SM), fine, ~25% fines, light brown, wet
10ft											
15ft	14-16	S6	31	57	48	48	24	21		~16 ft.	S6 - Silty SAND (SM), fine, 30-35% fines, trace fine gravel, light brown, wet
											Bottom of boring at 16 feet. Backfilled borehole with drill cuttings.
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Split spoon sampler bounced for 30 blows; drillers stopped sampling to avoid equipment damage.
3. Drill chattered at 3 feet.
4. Open hole drive and wash techniques used at 4 feet.

LGCI
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BORING LOG

Boring B-105
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/14/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/14/2018
LGCI Engineer:	Tom Sinnott	Location:	Southern edge of northern athletic field
Ground Surface El:	765.2 feet (see remark 1)	Total Depth:	17 feet
Groundwater Depth:	NE	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	4	3	6	10	24	11		Topsoil	S1 - Top 7": Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace organic fines, trace roots, dark brown, frozen
										Fill	Bot. 4": Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace roots, brown, moist
	2-4	S2	9	12	20	38	24	4			S2 - Silty SAND with Gravel (SM), fine, ~20% fines, 25-30% fine to angular gravel, brown, moist
5ft	4-6	S3	8	11	11	10	24	18		~6 ft.	S3 - Silty SAND (SM), fine to medium, 45-50% fines, trace fine subangular gravel, brown, moist
	6-8	S4	9	15	21	25	24	24		Sand	S4 - Silty SAND (SM), fine, ~25% fines, trace fine gravel, angular stone fragments, light brown, moist
10ft											
	10-12	S5	23	40	39	48	24	24			S5 - Similar to S4
15ft											
	15-17	S6	18	33	33	26	24	22		~17 ft.	S6 - Silty SAND (SM), fine, ~20% fines, ~5% fine gravel, gray, moist
											Bottom of boring at 17 feet. Backfilled borehole with drill cuttings.
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-106
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/13/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/13/2018
LGCI Engineer:	Tom Sinnott	Location:	Northern edge of northern athletic field
Ground Surface El:	766.5 feet (see remark 1)	Total Depth:	16 feet
Groundwater Depth:	~1.8 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	4	6	9	12	24	13		Topsoil	S1 - Top 6": Silty SAND (SM), fine, ~25% fines, ~5% fine gravel, trace organic fines, trace roots, dark brown, moist Bot. 7": Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, trace fine angular gravel, brown, moist
	2-4	S2	12	13	11	10	24	16		Fill	S2 - Silty SAND with Gravel (SM), fine, 15-20% fines, ~15% fine gravel, brown, moist
5ft	4-6	S3	16	18	16	22	24	12		~6 ft.	S3 - Silty SAND with Gravel (SM), fine, ~20% fines, ~15% fine gravel, trace roots, brown, moist
	6-8	S4	22	24	28	49	24	15	2		S4 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, 5-10% fines, 15-20% fine gravel, angular stone fragments, light brown, moist
									3		
	8-10	S5	17	24	18	55	24	11			S5 - Similar to S4, wet
10ft											
										Sand	
15ft	14-16	S6	25	30	29	31	24	11		~16 ft.	S6 - Silty SAND with Gravel (SM), fine, ~25% fines, ~15% fine gravel, light brown, wet
											Bottom of boring at 16 feet. Backfilled borehole with drill cuttings.
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 7 feet.
3. Open hole drive and wash techniques used at 8 feet.

BORING LOG

Boring B-107
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/14/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/14/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of northern athletic field
Ground Surface El:	765.9 feet (see remark 1)	Total Depth:	34.5 feet
Groundwater Depth:	~8 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	10	14	10	10	24	23		**Topsoil ~1 ft.**	S1 - Top 12": Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace organic fines, trace roots, dark brown, moist
										Subsoil ~4 ft.	Bot. 11": Silty SAND (SM), fine, 15-20% fines, ~5% fine gravel, trace roots, brown, moist
	2-4	S2	10	16	13	14	24	21			S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, 10-15% fines, 20-25% fine angular gravel, trace wood, tan, moist
5ft	4-6	S3	9	15	17	21	24	13		**Sand**	S3 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, 5-10% fines, 15-20% fine gravel, light brown, moist
	6-6.8	S4	20	60/3			9	8			S4 - Silty SAND (SM), fine, trace medium, ~20% fines, light brown, moist
	8-10	S5	13	15	23	23	24	16	2		S5 - Silty SAND with Gravel (SM), fine, trace medium, 30-35% fines, ~20% fine gravel, light brown, wet
10ft											
									3		
15ft	14-16	S6	21	35	65	56	24	23			S6 - Silty SAND (SM), fine, trace medium, 15-20% fines, ~10% fine gravel, light brown, wet
20ft	19-21	S7	14	33	57	64	24	21			S7 - Silty SAND (SM), fine, trace medium, trace coarse, ~20% fines, ~5% fine gravel, light brown, wet
	24-24.8	S8	70	60/4			10	10			S8 - Similar to S7, ~15% fines, trace fine angular gravel

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Open hole drive and wash techniques used at 9 feet.
3. Heavy drill chattering starting at 11 feet.

BORING LOG

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
30 ft	29-29.9	S9	51	75/5			11	11		**Sand**	S9 - Silty SAND (SM), fine, trace medium, trace coarse, ~15% fines, light brown, wet
35 ft	34-34.5	S10	100/6				6	6		**~34.5 ft.**	S10 - Similar to S9, trace fine angular gravel
											Bottom of boring at 34.5 feet. Backfilled borehole with drill cuttings.
40 ft											
45 ft											
50 ft											

Remarks:

BORING LOG

Boring B-108
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/23/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/26/2018
LGCI Engineer:	Tom Sinnott	Location:	Southern edge of playground
Ground Surface El:	763.3 feet (see remark 1)	Total Depth:	34.1 feet
Groundwater Depth:	~5 ft. on 2/23/2018	Drill Rig Type:	Mobile B-48 Track Rig
	~6 ft. on 2/26/2018	Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	4	2	3	6	24	9		Asphalt	Drilled through 3" of asphalt S1 - Top 2": Poorly Graded SAND (SP), fine, ~5% fines, ~5% fine gravel, trace organic fines, trace asphalt, orange, moist Bot. 7": Silty SAND with Gravel (SM), fine, ~15% fines, ~20% fine gravel, trace organic fines, brown, moist
	2-4	S2	19	12	18	21	24	16		Fill	S2 - Silty SAND (SM), fine, trace medium, ~15% fines, trace fine gravel, brown, moist
										~4 ft.	
5ft	4-6	S3	28	37	27	16	24	10			S3 - Silty SAND with Gravel (SM), fine, ~15% fines, ~25% fine gravel, light brown to gray, wet
	6-8	S4	19	16	17	17	24	11			S4 - Silty SAND (SM), fine, ~20% fines, trace fine gravel, gray, wet
	8-10	S5	13	23	24	21	24	18			S5 - Silty SAND (SM), fine, trace medium, trace coarse, ~25% fines, trace fine gravel, gray, wet
10ft											
									2		
15ft	14-16	S6	10	16	17	24	24	19		Sand	S6 - Similar to S5
									3		
20ft	19-21	S7	18	33	42	60	24	18			S7 - Similar to S5
	24-26	S8	20	31	60	59	24	17			S8 - Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine gravel, gray, wet

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Open hole drive and wash techniques used at 14 feet.
3. Drill chattered at 16.5 feet.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-108
Page 2 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
										Sand	
30 ft	29-30.3	S9	45	59	61/4		16	11			S9 - Similar to S8
									4		
										~34.1 ft.	
35 ft	34-34.1	S10	120/1				1	1			S10 - Silty SAND (SM), fine, 30-35% fines, gray, wet
											Bottom of boring at 34.1 feet. Backfilled borehole with drill cuttings and 2 bags of sand. Restored ground surface with asphalt cold patch.
40 ft											
45 ft											
50 ft											

Remarks:
4. Drill chattered at 32 feet.

LGCI
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BORING LOG

Boring B-109
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/14/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/15/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of track
Ground Surface El:	766.7 feet (see remark 1)	Total Depth:	36 feet
Groundwater Depth:	~8 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	23	35	27	24	24	21		Asphalt Fill ~2 ft.	S1 - Top 2": Asphalt Bot. 19": Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, trace coarse, 5-10% fines, ~15% fine gravel, brown, moist
	2-4	S2	21	20	17	15	24	17		Sand	S2 - Poorly Graded with Silt (SP-SM), fine, 5-10% fines, trace fine angular gravel, light brown, moist
5ft	4-6	S3	14	12	20	21	24	12			S3 - Silty SAND (SM), fine, trace medium, 15-20% fines, ~5% fine gravel, light brown, wet
	6-8	S4	21	27	24	30	24	14			S4 - Poorly Graded SAND with Gravel (SP), fine, 0-5% fines, ~15% fine gravel, light brown, wet
									2		
10ft	9-11	S5	24	32	24	34	24	16			S5 - Silty SAND (SM), fine, 15-20% fines, trace fine angular gravel, light brown, wet
15ft	14-16	S6	31	66	67	88	24	20			S6 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, light brown, wet
20ft	19-21	S7	12	29	38	45	24	19			S7 - Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine gravel, angular stone fragments, light brown, wet
	24-26	S8	17	28	35	42	24	20			S8 - Silty SAND (SM), fine, 35-40% fines, trace fine gravel, light brown, wet

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 8 feet.

BORING LOG

Boring B-109
Page 2 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
30 ft	29-30.7	S9	29	46	71	75/2	20	15		**Sand**	S9 - Silty SAND (SM), fine, trace medium, ~25% fines, trace fine angular gravel, light brown, wet
35 ft	34-36	S10	18	21	27	33	24	21		**~36 ft.**	S10 - Silty SAND (SM), fine, ~30% fines, light brown, wet
											Bottom of boring at 36 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
40 ft											
45 ft											
50 ft											

Remarks:

LGCI
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BORING LOG

Boring B-110-OW
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/26/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/26/2018
LGCI Engineer:	Tom Sinnott	Location:	Wooded area south of track
Ground Surface El:	765.4 feet (see remark 1)	Total Depth:	35.8 feet
Groundwater Depth:	~8.2 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
	~13.7 ft. 4.5 hrs. after installation	Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	3	6	9	24	12		Topsoil	S1 - Top 5": Silty SAND (SM), fine, 20-25% fines, trace organic fines, trace roots, dark brown, moist
											Bot. 7": Silty SAND (SM), fine, ~15% fines, trace fine gravel, brown, moist
	2-4	S2	16	20	29	29	24	12		Fill	S2 - Silty GRAVEL with Sand (GM), fine, angular, 20-25% fines, 35-40% fine to coarse sand, light brown, moist
										~4 ft.	
5ft	4-6	S3	20	26	19	18	24	12			S3 - Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, 5-10% fine gravel, angular stone fragments, light brown, moist
	6-8	S4	18	13	12	17	24	8			S4 - Silty SAND (SM), fine to coarse, 25-30% fines, 20-25% fine subrounded gravel, light brown, moist
10ft	9-11	S5	14	13	14	15	24	9			S5 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown, moist
15ft	14-16	S6	18	26	25	17	24	16		Sand	S6 - Similar to S5, wet
									2		
20ft	19-20.3	S7	36	57	63/4		16	14			S7 - Silty SAND (SM), fine, trace medium, ~15% fines, ~5% fine gravel, light brown, wet
	24-25.3	S8	37	68	52/4		16	11			S8 - Silty SAND (SM), fine, trace medium, ~15% fines, trace fine gravel, light brown, wet

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 18 feet.
3. Open hole drive and wash techniques used at 19 feet.

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
30 ft	29-30.8	S9	31	49	69	51/3	21	15		Sand	S9 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown, wet
35 ft	34-35.8	S10	28	28	54	66/3	21	14		~35.8 ft.	S10 - Silty SAND (SM), fine, trace medium, ~15% fines, trace fine gravel, light brown, wet
											Bottom of boring at 35.8 feet. Installed groundwater observation well.
40 ft											
45 ft											
50 ft											

Remarks:

Lahlaf Geotechnical Consulting, Inc.

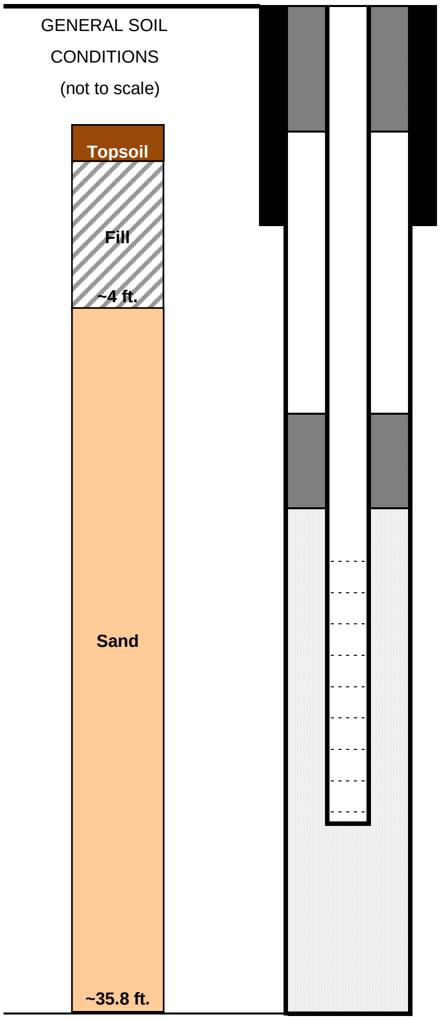
GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-110-OW**

Page 1/1

Project Name:	**Proposed Worcester South High School, Worcester, Massachusetts**
LGCI Project Number:	**1644**
Client:	**Lamoureux Pagano & Associates, Inc.**

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/26/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/26/2018
LGCI Engineer:	Tom Sinnott	Location:	Wooded area south of track
Ground Surface Elevation:	765.4 feet (see remark 1)	Total Depth of Boring:	35.8 feet
Ground Water Depth:	~12.7 ft. at end of installation	Drill Rig Type:	Mobile B-48 Track Rig
	~13.7 ft. 4.5 hours after installation	Drilling Method:	Drive and wash with 4-inch casing



Riser Stickup ~0' above ground surface

THICKNESS OF SURFACE SEAL	5 inch
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Aluminum road box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Holliston sand
DEPTH TO TOP OF SEAL	20 feet
TYPE OF SEAL	Bentonite chips
DEPTH TO BOTTOM OF SEAL	22 feet
DEPTH TO TOP OF PERVIOUS SECTION	25 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Holliston sand (4 bags)
DEPTH TO BOTTOM OF PERVIOUS SECTION	35 feet
DEPTH TO BOTTOM OF SAND COLUMN	35.8 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Holliston sand
DIAMETER OF BOREHOLE	9 inch
DEPTH TO BOTTOM OF BOREHOLE	35.8 feet

Remarks: 1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-111
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/21/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/21/2018
LGCI Engineer:	Tom Sinnott	Location:	NE corner of lower parking lot
Ground Surface El:	749.6 feet (see remark 1)	Total Depth:	15 feet
Groundwater Depth:	NE	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		5	6	4	18	9		Asphalt Fill	Drilled through 3" of asphalt S1 - Top 5": Silty SAND (SM), fine, ~15% fines, trace fine angular gravel, trace asphalt, brown, moist
	2-4	S2	5	5	4	5	24	10			Bot. 4": Silty SAND (SM), fine, ~30% fines, trace fine gravel, trace organic fines, black, moist
											S2 - Similar to Bot. 4" of S1, trace roots, trace wood
5ft	4-6	S3	3	3	2	2	24	7		Buried Organics	S3 - Similar to S2
	6-8	S4	3	3	3	42	24	10			S4 - Similar to S2, trace fine angular gravel
										~8 ft.	
	8-10	S5	15	26	20	19	24	18			S5 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, 5-10% fine gravel, angular stone fragments, gray, moist
10ft											
										Sand	
	13-15	S6	13	17	24	57	24	22			S6 - Silty SAND (SM), fine, ~15% fines, light brown to gray, moist
15ft										~15 ft.	
											Bottom of boring at 15 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
20ft											

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-112
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/21/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/21/2018
LGCI Engineer:	Tom Sinnott	Location:	Western edge of lower parking lot
Ground Surface El:	748.6 feet (see remark 1)	Total Depth:	15 feet
Groundwater Depth:	NE	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		2	5	5	18	10		Asphalt Fill ~8 ft.	Drilled through 2" of asphalt S1 - Silty SAND (SM), fine, ~20% fines, trace fine gravel, light brown, moist S2 - Similar to S1, angular stone fragments S3 - Silty SAND with Gravel (SM), fine, trace medium, ~15% fines, ~15% fine to coarse gravel, angular stone fragments, brown, moist S4 - Silty SAND (SM), fine, 20-25% fines, ~5% fine gravel, brown, moist
	2-4	S2	2	8	15	16	24	15			
5ft	4-6	S3	11	11	58	26	24	8			
	6-8	S4	14	9	9	11	24	13			
	8-10	S5	8	15	22	26	24	18		Sand ~15 ft.	S5 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, light brown to gray, moist S6 - Silty SAND (SM), fine, 15-20% fines, trace fine gravel, gray, moist
10ft											
	13-15	S6	19	26	24	27	24	20			
15ft											
											Bottom of boring at 15 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-113
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/21/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/22/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of lower parking lot
Ground Surface El:	745.7 feet (see remark 1)	Total Depth:	14.5 feet
Groundwater Depth:	~14.3 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	WOH	4	7	9	24	16	2	Topsoil ~2 ft.	S1 - Silty SAND (SM), fine, ~20% fines, trace fine gravel, trace roots, trace asphalt, trace brick, trace fabric, dark brown, moist
	2-4	S2	9	9	8	6	24	17		Fill ~12 ft.	S2 - Silty SAND (SM), fine, trace medium, ~20% fines, ~5% fine gravel, trace organic fines, trace roots, brown, moist
5ft	4-6	S3	2	5	6	8	24	18			S3 - Silty SAND (SM), fine, 15-20% fines, ~5% fine angular gravel, brown, moist
	6-8	S4	7	13	11	10	24	4	3		S4 - Similar to S3, trace fine gravel
	8-10	S5	5	3	5	5	24	11			S5 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace wood, brown, moist
10ft											
	10-12	S6	4	16	51	7	24	13			S6 - Top 6": Silty SAND (SM), fine, 30-35% fines, trace wood, dark brown to gray, moist Bot. 7": Fine angular gravel
	12-13.8	S7	5	22	25	95/3	21	10		Sand ~14.5 ft.	S7 - Silty SAND (SM), fine, trace medium, ~20% fines, trace fine angular gravel, angular stone fragments, dark brown, moist
15ft	14.5- 14.5	S8	120/0				0	0			S8 - No recovery
											Bottom of boring at 14.5 feet. Backfilled borehole with drill cuttings.
20ft											

Remarks:
1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
2. Boring location offset 15 feet to the west of original location. Alternate location is approximately 5 feet higher in elevation than the original location.
3. Drill chattered at 7 feet.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-114
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/21/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/21/2018
LGCI Engineer:	Tom Sinnott	Location:	SW corner of lower parking lot
Ground Surface El:	745.6 feet (see remark 1)	Total Depth:	15 feet
Groundwater Depth:	NE	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
	0.5-2	S1		5	8	9	18	14		Asphalt	Drilled through 3" of asphalt S1 - Silty SAND (SM), fine, ~20% fines, trace fine gravel, trace asphalt, light brown, moist
	2-4	S2	10	14	12	10	24	17		Fill	S2 - Silty SAND (SM), fine, 15-20% fines, brown, moist
										~4 ft.	
5ft	4-6	S3	8	13	12	9	24	20			S3 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, trace coarse, 10-15% fines, light brown, moist
	6-8	S4	13	14	14	11	24	21			S4 - Similar to S3
	8-10	S5	5	8	7	16	24	18		Sand	S5 - Silty SAND (SM), fine, ~15% fines, light brown, moist
10ft											
	13-15	S6	20	19	25	30	24	23			S6 - Similar to S5, trace fine angular gravel, light brown to gray
15ft										~15 ft.	
											Bottom of boring at 15 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
20ft											

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-115
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/22/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/22/2018
LGCI Engineer:	Tom Sinnott	Location:	SE corner of lower parking lot
Ground Surface El:	741.1 feet (see remark 1)	Total Depth:	19.2 feet
Groundwater Depth:	NE	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	5	8	9	24	17		Topsoil	S1 - Top 5": Silty SAND (SM), fine, ~25% fines, trace organic fines, trace roots, trace leaves, dark brown, moist Bot. 12": Silty SAND (SM), fine, ~20% fines, trace wood, brown, moist
	2-4	S2	10	16	22	21	24	18			S2 - Silty SAND (SM), fine, 15-20% fines, ~5% fine angular gravel, brown, moist
5ft	4-6	S3	7	6	6	5	24	14			S3 - Silty SAND (SM), fine, ~20% fines, gray, moist
	6-8	S4	7	8	7	12	24	13		Fill	S4 - Silty SAND (SM), fine, 30-35% fines, trace fine gravel, trace organic fines, trace wood, trace roots, dark brown, moist
	8-9.3	S5	5	6	120/3		15	7			S5 - Similar to S4, trace fine angular gravel
10ft									2		
	10-11.7	S6	1	2	73	47/2	20	9		~12 ft.	S6 - Similar to S4
										Boulder ~13 ft.	
	13-14.3	S7	6	5	60/3		15	7		Fill	S7 - Silty SAND (SM), fine, 15-20% fines, trace fine angular gravel, trace wood, trace roots, brown, moist
15ft											
	16.5-16.8	S8	120/3				3	0		~16.5 ft.	S8 - No recovery
										Boulder ~16.5 ft.	
	17.5-19.2	S9	30	44	61	59/4	22	12	3	Sand ~19.2 ft.	S9 - Silty SAND (SM), fine, 15-20% fines, 5-10% fine gravel, angular stone fragments, gray, moist
20ft											Bottom of boring at 19.2 feet. Backfilled borehole with drill cuttings and 2 bags of sand.

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Offset borehole 3 feet west.
3. Split spoon sampler bouncing; drillers stopped sampling to avoid equipment damage.

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BORING LOG

Boring B-116
Page 1 of 2

Project: **Proposed Worcester South High School, Worcester, Massachusetts**

Client: **Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/26/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/27/2018
LGCI Engineer:	Tom Sinnott	Location:	Northern edge of existing school
Ground Surface El:	767.4 feet (see remark 1)	Total Depth:	39 feet
Groundwater Depth:	~7.2 ft. on 2/26/2018	Drill Rig Type:	Mobile B-48 Track Rig
	~7.5 ft. at end of drilling	Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		3	4	7	18	6		Concrete	Drilled through 4" of concrete S1 - Silty SAND (SM), fine, ~25% fines, trace roots, trace organic fines, brown, wet
	2-4	S2	8	9	12	14	24	15		Fill	S2 - Silty SAND (SM), fine, 15-20% fines, ~5% fine gravel, trace organic fines, brown, wet
										~4 ft.	
5ft	4-6	S3	15	16	16	13	24	12			S3 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, ~5% fine gravel, light brown, wet
	6-8	S4	12	14	20	25	24	19			S4 - Silty SAND (SM), fine, ~15% fines, 5-10% fine gravel, light brown, wet
	8-10	S5	16	21	27	46	24	14			S5 - Silty SAND (SM), fine, 15-20% fines, trace fine gravel, light brown, wet
10ft											
									2		
									3		
15ft	14-16	S6	22	26	33	40	24	15		Sand	
											S6 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, light brown, moist
20ft	19-21	S7	25	43	64	37	24	16			S7 - Silty SAND (SM), fine, 25-30% fines, trace fine gravel, angular stone fragments, gray, wet
	24-25.8	S8	28	37	72	48/3	21	16			S8 - Silty SAND (SM), fine, trace medium, trace coarse, 25-30% fines, trace fine gravel, gray, wet

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 13 feet.
3. Open hole drive and wash techniques used at 14 feet.

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BORING LOG

Boring B-116
Page 2 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
30 ft	29-30.7	S9	15	36	70	50/2	20	12	4		S9 - Similar to S8
										Sand	
35 ft	34-34.8	S10	73	47/2			8	8			S10 - Silty SAND (SM), fine, ~30% fines, trace fine gravel, gray, wet
									5	**~39 ft.**	
40 ft											
											Bottom of boring at 39 feet. Backfilled borehole with drill cuttings.
45 ft											
50 ft											

Remarks:
4. Drill chattered at 30 feet.
5. Borehole collapse at 30 feet after washing to 39 feet. Possible boulder fell into borehole causing the collapse.

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BORING LOG

Boring B-117B
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/27/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/27/2018
LGCI Engineer:	Tom Sinnott	Location:	Northern edge of existing school
Ground Surface El:	769.5 feet (see remark 1)	Total Depth:	41 feet
Groundwater Depth:	~8 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	3	4	6	24	3		Topsoil	S1 - Silty SAND (SM), fine, ~30% fines, trace fine gravel, trace organic fines, trace roots, dark brown, moist
										~2 ft.	
	2-4	S2	18	19	17	17	24	8			S2 - Silty SAND with Gravel (SM), fine, 15-20% fines, ~15% fine angular gravel, brown, moist
5ft	4-6	S3	13	10	11	47	24	13		Fill	S3 - Silty SAND (SM), fine, 15-20% fines, trace fine gravel, trace roots, trace wood, angular stone fragments, gray, wet
	6-6.3	S4	120/4				4	4			S4 - Silty SAND (SM), fine, 20-25% fines, trace fine angular gravel, gray, wet
										~8 ft.	
	8-10	S5	13	15	23	15	24	12			S5 - Silty SAND (SM), fine, ~15% fines, 10-15% fine subangular gravel, light brown, wet
10ft											
									2		
15ft	14-16	S6	9	11	8	16	24	15		Sand	S6 - Silty SAND (SM), fine, ~20% fines, trace fine gravel, light brown, wet
									3		
20ft	19-21	S7	25	39	45	37	24	22			S7 - Silty SAND (SM), fine, trace medium, 15-20% fines, trace fine gravel, light brown, wet
	24-26	S8	22	24	40	53	24	19			S8 - Similar to S7, gray

Remarks:
1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
2. Drill chattered at 12 feet.
3. Open hole drive and wash technique used at 18.5 feet.

BORING LOG

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
30 ft	29-31	S9	32	76	41	40	24	14			S9 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, angular stone fragments, gray, wet
										Sand	
35 ft	34-36	S10	11	19	23	32	24	13			S10 - Silty SAND (SM), fine, trace medium, ~25% fines, ~5% fine gravel, gray, wet
40 ft	39-41	S11	23	33	39	54	24	20		**~41 ft.**	S11 - Silty SAND (SM), fine, trace medium, ~25% fines, trace fine gravel, gray to brown, wet
											Bottom of boring at 41 feet. Backfilled borehole with drill cuttings.
45 ft											
50 ft											

Remarks:

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BORING LOG

Boring B-118B-OW
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/27/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/27/2018
LGCI Engineer:	Tom Sinnott	Location:	NE corner of existing school
Ground Surface El:	775 feet (See remark 1)	Total Depth:	41 feet
Groundwater Depth:	~13.2 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
	~12.5 ft. 5.5 hrs. after installation	Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
	0-2	S1	1	6	43	10	24	9		Topsoil ~2.7 ft.	S1 - Silty SAND (SM), fine, 20-25% fines, trace organic fines, trace roots, angular stone fragments, dark brown, moist
	2-2.7	S2	35	60/1			7	4	2		S2 - Similar to S1, dark brown to brown
										Fill ~6 ft.	
5ft	4-6	S3	8	8	11	14	24	5			S3 - Silty SAND (SM), fine, trace medium, ~25% fines, trace fine gravel, brown, wet
	6-8	S4	25	56	43	22	24	14		Sand	S4 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded, 25-30% fines, 35-40% fine to coarse sand, light brown, wet
	8-9.1	S5	21	58	62/2		14	10	3		S5 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown to brown, wet
10ft											
									4		
15ft	14-16	S6	8	7	14	39	24	15			S6 - Silty SAND (SM), fine, trace medium, 20-25% fines, light brown, wet
20ft	19-21	S7	10	25	22	28	24	13			S7 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, light brown, wet
									5		
	24-26	S8	18	24	25	54	24	18			S8 - Silty SAND (SM), fine, trace medium, trace coarse, ~25% fines, gray, wet

Remarks:
1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
2. Encountered boulder at 2.5 feet. Offset boring 2 feet west.
3. Open hole drive and wash technique used at 9 feet.
4. Heavy drill chattering from 9.5 feet to 11 feet due to possible boulder.
5. Switched to 3 inch casing; open hole drive and wash technique used at 24 feet.

BORING LOG

Boring B-118B-OW
Page 2 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Sand	
30 ft	29-31	S9	18	28	35	45	24	21			S9 - Similar to S8
35 ft	34-36	S10	26	33	36	38	24	20			S10 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, gray, wet
40 ft	39-41	S11	40	39	43	38	24	21			S11 - Silty SAND (SM), fine, 25-30% fines, gray, wet
										~41 ft.	
											Bottom of boring at 41 feet. Installed groundwater observation well.
45 ft											
50 ft											

Remarks:

Lahlaf Geotechnical Consulting, Inc.

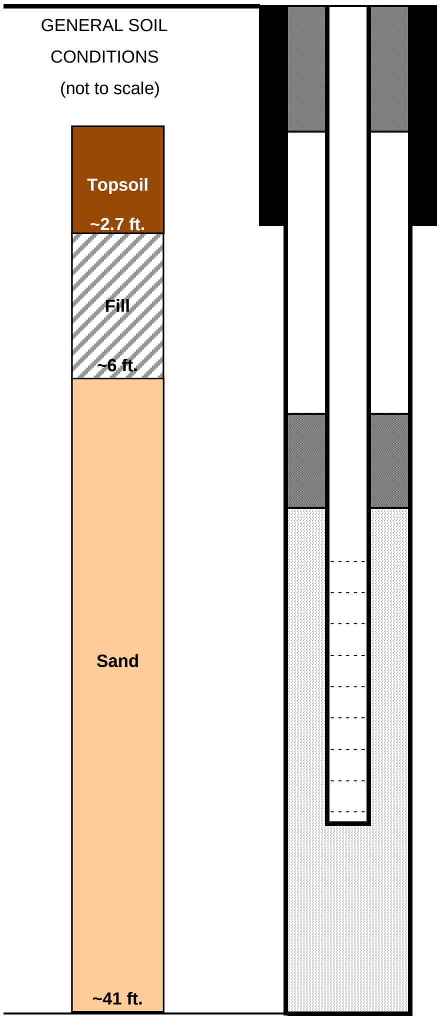
GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-118B-OW**

Page 1/1

Project Name:	**Proposed Worcester South High School, Worcester, Massachusetts**
LGCI Project Number:	**1644**
Client:	**Lamoureux Pagano & Associates, Inc.**

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/28/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/28/2018
LGCI Engineer:	Tom Sinnott	Location:	NE corner of existing school
Ground Surface Elevation:	775.0 feet (see remark 1)	Total Depth of Boring:	41 feet
Ground Water Depth:	~8.9 ft. at end of installation	Drill Rig Type:	Mobile B-48 Track Rig
	~12.8 ft. 5.5 hours after installation	Drilling Method:	Drive and wash with 4-inch casing



Riser Stickup ~0' above ground surface

THICKNESS OF SURFACE SEAL	5 inch
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Roadway box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Holliston sand
DEPTH TO TOP OF SEAL	25 feet
TYPE OF SEAL	Bentonite chips
DEPTH TO BOTTOM OF SEAL	27 feet
DEPTH TO TOP OF PERVIOUS SECTION	30 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Holliston sand (2 bags)
DEPTH TO BOTTOM OF PERVIOUS SECTION	40 feet
DEPTH TO BOTTOM OF SAND COLUMN	41 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Holliston sand
DIAMETER OF BOREHOLE	4 inch
DEPTH TO BOTTOM OF BOREHOLE	~41 feet

Remarks:

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.

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BORING LOG

Boring B-119A
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/28/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/28/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of existing school
Ground Surface El:	777.7 feet (See remark 1)	Total Depth:	41 feet
Groundwater Depth:	~8 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	3	2	2	24	15		Topsoil	S1 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace organic fines, trace roots, dark brown, moist
	2-4	S2	2	3	2	17	24	18			S2 - Silty SAND (SM), fine, ~25% fines, ~5% fine gravel, trace organic fines, trace roots, dark brown, moist
										~4 ft.	
5ft	4-6	S3	16	8	9	11	24	9		Fill	S3 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace organic fines, brown, wet
	6-8	S4	11	12	17	6	24	9			S4 - Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 30-35% fine to coarse angular gravel, trace organic fines, brown, wet
										~8 ft.	
	8-10	S5	19	19	20	26	24	10		Sand	S5 - Silty SAND with Gravel (SM), fine, 15-20% fines, ~15% fine gravel, light brown, wet
10ft											
										~14.4 ft.	S6 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, 5-10% fines, 10-15% fine gravel, light brown, wet
15ft	14-14.4	S6	60/5				5	4	2	Boulder	
										~16 ft.	
	16-18	S7	11	10	15	16	24	10		Sand	S7 - Silty GRAVEL with Sand (GM), fine to coarse, angular,35-40% fines, 25-30% fine to medium, trace coarse sand, light brown, wet
									3		
20ft	19-21	S8	15	14	19	29	24	16			S8 - Silty SAND (SM), fine, trace medium, 15-20% fines, ~5% fine gravel, light brown, wet
	24-25.7	S9	59	51	40	80/2	20	13			S9 - Silty SAND (SM), fine, ~20% fines, ~5% fine gravel, gray, wet

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Heavy drill chattering from 14.5 feet to 16 feet. Encountered possible boulder.
3. Open hole drive and wash technique used at 19 feet.

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
										Sand **~41 ft.**	
30 ft	29-31	S10	39	51	38	38	24	16			S10 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, gray, wet
35 ft	34-36	S11	22	29	31	31	24	17			S11 - Silty SAND (SM), fine, 20-25% fines, gray, wet
40 ft	39-41	S12	31	31	32	31	24	15			S12 - Similar to S11
											Bottom of boring at 41 feet. Backfilled borehole with drill cuttings.
45 ft											
50 ft											

Remarks:

BORING LOG

Boring B-120A
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/28/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/31/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of existing school
Ground Surface El:	778.9 feet (see remark 1)	Total Depth:	46 feet
Groundwater Depth:	~9 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4-inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	4	6	8	24	17		Topsoil	S1 - Top 6": Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace organic fines, trace roots, dark brown, moist Bot. 11": Silty SAND (SM), fine, ~15% fines, ~5% fine gravel, trace roots, brown, moist
	2-4	S2	9	10	19	21	24	8			S2 - Similar to Bot. 11" of S1, trace fine angular gravel
5ft	4-6	S3	19	13	17	24	24	11		Fill	S3 - Silty SAND (SM), fine, ~25% fines, trace fine gravel, trace organic fines, brown, wet
	6-8	S4	22	32	32	27	24	14			S4 - Similar to S3, trace fine angular gravel
										~8 ft.	
	8-10	S5	26	40	38	44	24	11			S5 - Silty SAND (SM), fine, ~15% fines, 5-10% fine gravel, light brown, wet
10ft											
	10-12	S6	41	33	39	34	24	0			S6 - No Recovery
	12-14	S7	20	23	21	28	24	13			S7 - Silty SAND (SM), fine, trace medium, ~15% fines, light brown, wet
									2		
15ft	14-16	S8	64	27	26	33	24	11			S8 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, light brown, wet
										Sand	
									3		
20ft	19-21	S9	13	21	25	43	24	15			S9 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, light brown, wet
	24-26	S10	21	29	38	75	24	19			S10 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, light brown to gray, wet

Remarks:

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
2. Open hole drive and wash technique used at 14 feet.
3. Drill chattered from 18 feet to 19 feet. Encountered possible boulder.

BORING LOG

Boring B-120A

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
30 ft	29-29	S11	120/0				0	0	4		S11 - No Recovery
	30-32	S12	32	45	40	56	24	15			S12 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, gray, wet
35 ft	34-36	S13	28	50	49	64	24	22		**Sand**	S13 - Silty SAND (SM), fine, ~20% fines, gray, wet
40 ft	39-41	S14	15	38	47	35	24	15			S14 - Silty SAND (SM), fine, trace medium, ~20% fines, trace fine gravel, gray, wet
45 ft	44-46	S15	13	25	26	21	24	13	5		S15 - Silty SAND (SM), fine, trace medium, ~20% fines, gray, wet
										~46 ft.	
											Bottom of boring at 46 feet. Backfilled borehole with drill cuttings and 1 bag of sand.
50 ft											

Remarks:
4. Drill chattered from 29 feet to 30 feet. Encountered possible boulder.
5. Alternate location is offset ~10 feet south from original location. Alternate location is ~5 feet higher in elevation than the original location.

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BORING LOG

Boring B-121

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/22/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/22/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of roadway SE of school
Ground Surface El:	774.8 feet (see remark 1)	Total Depth:	27 feet
Groundwater Depth:	~21 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		6	7	5	18	12		Asphalt	Drilled through 2" of asphalt S1 - Silty SAND (SM), fine, ~20% fines, ~5% fine gravel, trace asphalt, brown, moist
	2-4	S2	9	11	19	53	24	15		Fill	S2 - Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, ~15% fine angular gravel, brown, moist
										~4 ft.	
5ft	4-6	S3	13	23	28	28	24	14			S3 - Silty SAND (SM), 15-20% fines, trace fine gravel, angular stone fragments, light brown, moist
	6-8	S4	21	20	22	26	24	14			S4 - Similar to S3
10ft											
	10-12	S5	11	14	15	16	24	19			S5 - Silty SAND (SM), fine, trace medium, 20-25% fines, 5-10% fine gravel, light brown, moist
									2		
15ft										Sand	
	15-17	S6	18	62	25	22	24	19			S6 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, angular stone fragments, light brown, moist
20ft											
	20-22	S7	6	11	16	16	24	17			S7 - Silty SAND (SM), fine, ~25% fines, light brown, moist

Remarks:
1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.
2. Drill chattered at 13 feet.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-121
Page 2 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	25-27	S8	16	60	37	27	24	12		**Sand** **~27 ft.**	S8 - Silty SAND (SM), fine, 20-25% fines, trace angular fine gravel, light brown, wet
											Bottom of boring at 27 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
30 ft											
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:

LGCI
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BORING LOG

Boring B-122
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/22/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/22/2018
LGCI Engineer:	Tom Sinnott	Location:	Eastern edge of roadway SE of school
Ground Surface El:	775.8 feet (see remark 1)	Total Depth:	22 feet
Groundwater Depth:	~18 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	9	6	6	24	10		Topsoil ~2 ft.	S1 - Silty SAND (SM), fine, 25-30% fines, trace fine angular gravel, trace organic fines, trace roots, trace leaves, dark brown, moist
	2-4	S2	4	4	2	3	24	9		Fill ~16 ft.	S2 - Silty SAND (SM), ~20% fines, ~5% fine gravel, brown to gray, moist
5ft	4-6	S3	2	2	3	2	24	12			S3 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace roots, brown, moist
	6-8	S4	1	2	2	2	24	8			S4 - Similar to S3
	8-10	S5	1	1	1	1	24	13			S5 - Silty SAND (SM), fine, ~25% fines, trace fine gravel, trace roots, trace organic fines, trace wood, brown, moist
10ft											
	10-12	S6	1	1	4	9	24	6			S6 - Silty SAND (SM), fine, 20-25% fines, trace fine gravel, brown, wet
	12-14	S7	4	3	3	1	24	6			S7 - Similar to S6, trace roots
15ft	14-16	S8	WOH	1	4	5	24	8			S8 - Similar to S6, trace organic fines
	16-18	S9	6	7	10	8	24	11		Sand ~22 ft.	S9 - Silty SAND (SM), fine, 15-20% fines, light brown, wet
20ft											
	20-22	S10	3	7	5	5	24	10			S10 - Silty SAND (SM), fine, ~15% fines, light brown, wet
											Bottom of boring at 22 feet. Backfilled borehole with drill cuttings and 1 bag of sand.

Remarks:
1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.

LGCI
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BORING LOG

Boring B-123-OW
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/23/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/23/2018
LGCI Engineer:	Tom Sinnott	Location:	Island east of the existing school
Ground Surface El:	788.3 feet (see remark 1)	Total Depth:	22 feet
Groundwater Depth:	~18.5 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
	~18.7 ft. after installation	Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-0.7	S1	10	60/2			8	2		Topsoil	S1 - Silty SAND (SM), fine, ~25% fines, trace organic fines, trace roots, trace angular fine gravel, dark brown, moist
	2-4	S2	6	17	15	14	24	19		~2.4 ft.	S2 - Top 5": Similar to S1, no trace fine angular gravel Bot. 14": Silty SAND (SM), fine, ~15% fines, 5-10% fine angular gravel, light brown, moist
										Fill ~4 ft.	
5ft	4-6	S3	11	48	47	15	24	17			S3 - Silty SAND (SM), fine, 15-20% fines, ~5% fine gravel, angular stone fragments, light brown, moist
	6-8	S4	14	13	15	40	24	15			S4 - Silty SAND (SM), fine, ~15% fines, light brown, moist
									2		
									3		
10ft											
	10-12	S5	17	19	17	13	24	19			S5 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown, moist
										Sand	
15ft											
	15-17	S6	9	15	18	10	24	17			S6 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, 10-15% fines, ~15% fine gravel, light brown, moist
20ft											
	20-22	S7	5	3	6	8	24	10			S7 - Silty SAND (SM), fine, ~15% fines, trace fine gravel, light brown, wet
										~22 ft.	
											Bottom of boring at 22 feet. Installed groundwater observation well.

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 8 feet.
3. Auger refusal at 9 feet. Offset borehole 3 feet north.

LGCI
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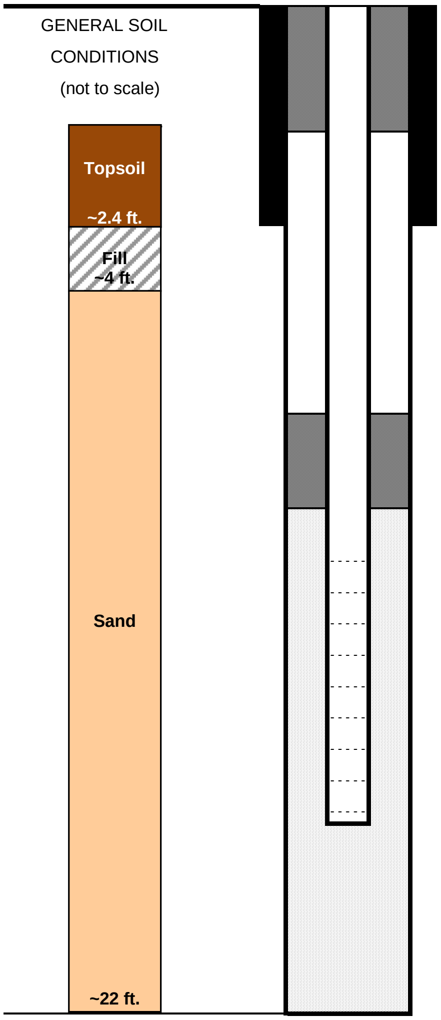
GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-123-OW**

Page 1/1

Project Name:	**Proposed Worcester South High School, Worcester, Massachusetts**		
LGCI Project Number:	**1644**		
Client:	**Lamoureux Pagano & Associates, Inc.**		
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/23/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/23/2018
LGCI Engineer:	Tom Sinnott	Location:	Island east of the existing school
Ground Surface Elevation:	788.3 feet (See remark 1)	Total Depth of Boring:	22 feet
Ground Water Depth:	~18.7 ft. at end of installation	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)



Riser Stickup ~0' above ground surface

THICKNESS OF SURFACE SEAL	6 inch
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Aluminum road box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Drill cuttings
DEPTH TO TOP OF SEAL	7 feet
TYPE OF SEAL	Bentonite chips
DEPTH TO BOTTOM OF SEAL	9 feet
DEPTH TO TOP OF PERVIOUS SECTION	10
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Holliston sand (3 bags)
DEPTH TO BOTTOM OF PERVIOUS SECTION	20 feet
DEPTH TO BOTTOM OF SAND COLUMN	22 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Holliston sand
DIAMETER OF BOREHOLE	9 inch
DEPTH TO BOTTOM OF BOREHOLE	22 feet

Remarks: 1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
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BORING LOG

Boring B-124
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	3/1/2018
Drilling Foreman:	Tim Tucker	Date Completed:	3/1/2018
LGCI Engineer:	Tom Sinnott	Location:	Southern edge of existing school
Ground Surface El:	784.5 feet (see remark 1)	Total Depth:	10.8 feet
Groundwater Depth:	~2.5 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4 inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	2	13	17	15	24	22		Topsoil	S1 - Top 7": Silty SAND (SM), fine, ~25% fines, trace organic fines, trace roots, dark brown, moist
											Bot. 15": Silty SAND with Gravel (SM), fine, ~15% fines, ~15% fine gravel, trace plastic, brown, moist
	2-4	S2	18	18	19	17	24	18			S2 - Similar to Bot. 15" of S1
5ft	4-6	S3	21	67	40	35	24	14		Fill	S3 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 40-45% fine to coarse angular gravel, brown, moist
	6-7	S4	56	64			12	12			S4 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, ~15% fine angular gravel, angular stone fragments, brown, moist
										~8 ft.	
	8-8.8	S5	29	60/3			9	4			S5 - Silty SAND with Gravel (SM), fine, trace medium, ~15% fines, ~15% fine angular gravel, angular stone fragments, light brown, wet
10ft										Sand	
	10-10.8	S6	55	65/3			9	9		~10.8 ft.	S6 - Silty SAND (SM), fine, ~15% fines, trace fine angular gravel, light brown, wet
											Bottom of boring at 10.8 feet. Backfilled borehole with drill cuttings.
15ft											
20ft											

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

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BORING LOG

Boring B-125
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/23/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/23/2018
LGCI Engineer:	Tom Sinnott	Location:	Southern edge of southern parking lot
Ground Surface El:	782.8 feet (see remark 1)	Total Depth:	17 feet
Groundwater Depth:	NE	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	5	6	5	7	24	13		Asphalt	S1 - Top 4": Asphalt, trace plastic Bot. 9": Silty SAND (SM), fine, 15-20% fines, ~5% angular gravel, brown, moist
	2-4	S2	9	17	16	22	24	12		Fill	S2 - Silty SAND (SM), fine, ~30% fines, ~5% fine gravel, trace roots, trace organic fines, trace roots, brown, wet
										~4 ft.	
5ft	4-6	S3	8	13	17	17	24	21			S3 - Top 14": Poorly Graded SAND with Silt (SP-SM), fine, ~5% fines, 10-15% fine gravel, light brown, wet Bot. 7": Silty SAND (SM), fine, 25-30% fines, ~5% fine gravel, light brown to gray, moist
	6-8	S4	15	20	23	21	24	16			S4 - Silty SAND with Gravel (SM), fine, ~30% fines, ~15% fine gravel, angular stone fragments, gray, moist
10ft											
	10-12	S5	8	17	18	10	24	19		Sand	S5 - Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine gravel, gray, moist
15ft											
	15-17	S6	10	15	17	20	24	24			S6 - Similar to S5
										~17 ft.	
											Bottom of boring at 17 feet. Backfilled borehole with drill cuttings.
20ft											

Remarks:

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-126
Page 1 of 1

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Drilling Subcontractor: Drilling Foreman: LGCI Engineer:	Date Started: Date Completed: Location:
Ground Surface El: Groundwater Depth:	Total Depth: Drill Rig Type: Drilling Method:
Hammer Weight: Hammer Type: Drop:	Split Spoon Diameter: Rock Core Barrel Size:

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
											Boring B-126 was not performed due to difficult access along steep slope.
5ft											
10ft											
15ft											
20ft											

Remarks:

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-127
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/15/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/16/2018
LGCI Engineer:	Tom Sinnott	Location:	Wooded area south of existing school
Ground Surface El:	788.7 feet (see remark 1)	Total Depth:	26 feet
Groundwater Depth:	~6.1 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4 inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
	0-2	S1	2	7	16	19	24	15		Sand	S1 - Silty SAND (SM), fine, trace medium, trace coarse, ~15% fines, light brown, moist
	2-4	S2	18	25	41	40	24	16			S2 - Similar to S1, trace fine angular gravel
5ft	4-6	S3	37	33	40	44	24	15			S3 - Similar to S1, trace fine angular gravel
									2		
10ft	9-10.7	S4	12	23	67	60/2	20	13			S4 - Silty SAND (SM), fine, 25-30% fines, trace fine gravel, light brown, wet
15ft	14-16	S5	24	43	56	38	24	15			S5 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, light brown, wet
20ft	19-20.8	S6	14	26	25	75/4	22	14			S6 - Silty SAND (SM), fine, ~40% fines, gray, wet
	24-26	S7	11	16	18	17	24	17			S7 - Similar to S6, ~30% fines

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Open hole drive and wash technique used at 8.5 feet.

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Sand ~26 ft.	
											Bottom of boring at 26 feet. Backfilled borehole with drill cuttings.
30 ft											
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-128-OW
Page 1 of 2

Project: **Proposed Worcester South High School, Worcester, Massachusetts**

Client: **Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/15/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/15/2018
LGCI Engineer:	Tom Sinnott	Location:	Wooded area south of existing school
Ground Surface El:	790.5 feet (See remark 1)	Total Depth:	31 feet
Groundwater Depth:	~13.1 ft. at end of drilling ~9.4 ft. 2 hours after installation	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4 inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
	0-2	S1	WOH	4	5	8	24	13			S1 - Silty SAND (SM), fine, 20-25% fines, trace organic fines, trace roots, dark brown, moist
										Topsoil	
	2-4	S2	16	12	8	10	24	6			S2 - Similar to S1, 5-10% fine gravel, trace fine angular gravel
										~4 ft.	
5ft	4-6	S3	9	14	22	11	24	4		Subsoil	S3 - Poorly Graded Gravel (GP), coarse, 0-5% fines, 10-15% fine to coarse sand, brown to orange, moist
	6-8	S4	8	33	11	14	24	10		~6.5 ft.	S4 - Top 6": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine gravel, trace roots, angular stone fragments, dark brown, moist
											Bot. 4": Silty SAND (SM), fine, trace medium, ~20% fines, brown, moist
	8-10	S5	19	22	24	31	24	14			S5 - Silty SAND (SM), fine, ~25% fines, light brown, wet
10ft											
	10-12	S6	27	29	33	29	24	13			S6 - Similar to S5, trace fine angular gravel
										Sand	
15ft	14-16	S7	20	23	30	30	24	12			S7 - Similar to S6
									2		
									3		
20ft	19-19.3	S8	100/4				4	4		~20 ft.	S8 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 10-15% fine gravel, light brown to gray, wet
										Boulder	
										~23 ft.	
										Sand	
	24-26	S9	33	54	27	36	24	16			S9 - Silty SAND (SM), fine, trace medium to coarse, 25-30% fines, trace fine gravel, light brown, wet

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 16 feet.
3. Open hole drive and wash techniques used at 18 feet.

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
										Sand	
30 ft	29-31	S10	22	28	38	33	24	24			S10 - Silty SAND (SM), fine, trace medium, 25-30% fines, gray, wet
										~31 ft.	
											Bottom of boring at 31 feet. Installed groundwater observation well.
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:

Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

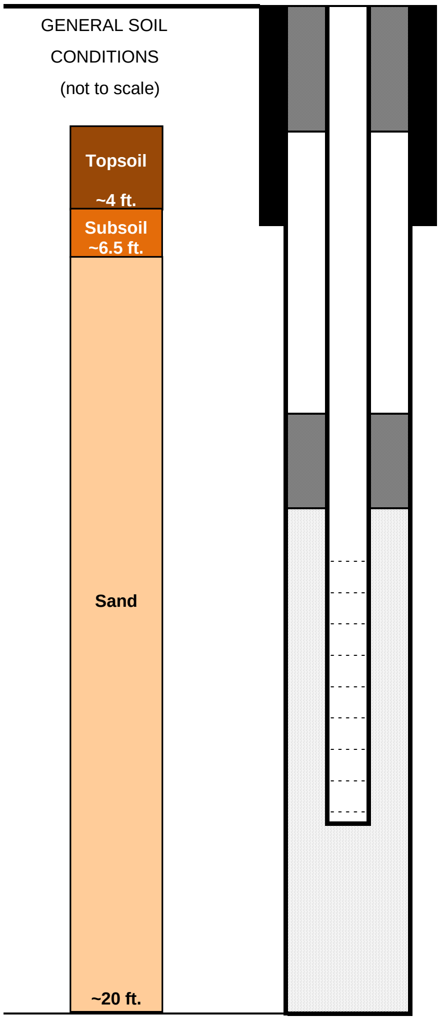
Boring No. : **B-128-OW**

Page 1/1

Project Name:	**Proposed Worcester South High School, Worcester, Massachusetts**
LGCI Project Number:	**1644**
Client:	**Lamoureux Pagano & Associates, Inc.**

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/15/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/15/2018
LGCI Engineer:	Tom Sinnott	Location:	Wooded area south of existing school
Ground Surface Elevation:	790.5 feet (See remark 1)	Total Depth of Boring:	31 feet
Ground Water Depth:	~9.3 ft. at end of installation ~9.4 ft. 2 hours after installation	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4 inch casing

Riser Stickup ~0' above ground surface



THICKNESS OF SURFACE SEAL	6 inch
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Aluminum road box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Drill cuttings/Holliston Sand
DEPTH TO TOP OF SEAL	18 feet
TYPE OF SEAL	Bentonite chips
DEPTH TO BOTTOM OF SEAL	20 feet
DEPTH TO TOP OF PERVIOUS SECTION	20 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Holliston sand
DEPTH TO BOTTOM OF PERVIOUS SECTION	30 feet
DEPTH TO BOTTOM OF SAND COLUMN	31 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Holliston sand
DIAMETER OF BOREHOLE	8 inch
DEPTH TO BOTTOM OF BOREHOLE	32 feet

Remarks: 1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

Boring B-129
Page 1 of 2

Project: **Proposed Worcester South High School, Worcester, Massachusetts**
Client: **Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/16/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/16/2018
LGCI Engineer:	Tom Sinnott	Location:	Western edge of southern wooded area
Ground Surface El:	784.2 feet (see remark 1)	Total Depth:	31 feet
Groundwater Depth:	~8 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4 inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	4	4	7	5	24	24		Topsoil	S1 - Silty SAND (SM), fine, ~25% fines, trace organic fines, trace roots, dark brown, moist
										~2 ft.	
	2-4	S2	11	7	4	5	24	10			S2 - Silty SAND (SM), fine, ~20% fines, trace organic fines, brown, moist
5ft	4-6	S3	4	9	7	5	24	7		Subsoil	S3 - Silty SAND (SM), fine, trace medium, ~30% fines, trace organic fines, trace roots, brown, wet
	6-8	S4	5	6	11	24	24	5			S4 - Similar to S3, trace fine angular gravel
										~8 ft.	
	8-10	S5	26	73	26	19	24	12			S5 - Silty SAND (SM), fine, trace medium, 15-20% fines, 5-10% fine gravel, angular stone fragments, light brown, wet
10ft											
	10-12	S6	25	25	29	34	24	14			S6 - Similar to S5
										Sand	
15ft	14-16	S7	60	39	32	34	24	15			S7 - Silty SAND with Gravel (SM), fine, 15-20% fines, ~15% fine gravel, light brown, wet
									2		
									3		
20ft	19-21	S8	17	22	18	22	24	12		~20 ft.	S8 - Silty SAND (SM), fine, ~15% fines, ~5% fine gravel, angular stone fragments, light brown, wet
										Boulder	
										~23 ft.	
										Sand	
	24-26	S9	15	18	25	34	24	17			S9- Silty SAND (SM), fine, ~35% fines, trace fine gravel, gray, wet

Remarks:
1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Drill chattered at 18 feet.
3. Open hole drive and wash technique used at 19 feet.

BORING LOG

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Sand	
30 ft	29-31	S10	10	13	48	24	24	15		**~31 ft.**	S10 - Similar to S9
											Bottom of boring at 31 feet. Backfilled borehole with drill cuttings.
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:

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BORING LOG

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/16/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/16/2018
LGCI Engineer:	Tom Sinnott	Location:	SW corner of playing field
Ground Surface El:	768.5 feet (see remark 1)	Total Depth:	30.8 feet
Groundwater Depth:	~7.2 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	Drive and wash with 4 inch casing
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches				Pen (in)	Rec (in)	Remarks	Strata	Sample Description
			0-6	6-12	12-18	18-24					
	0-2	S1	5	1	3	7	24	14		Topsoil	S1 - Top 11": Silty SAND (SM), fine, 20-25% fines, trace fine gravel, trace organic fines, trace roots, dark brown, moist
										Subsoil	Bot. 3": Silty SAND (SM), fine, trace medium, 15-20% fines, trace fine gravel, brown, moist
	2-4	S2	8	8	7	13	24	16			S2 - Silty SAND (SM), fine, trace medium, 15-20% fines, trace fine gravel, angular stone fragments, brown, moist
										~4 ft.	
5ft	4-6	S3	9	13	12	24	24	15			S3 - Silty SAND (SM), fine, 20-25% fines, light brown, wet
	6-8	S4	22	13	10	10	24	8			S4 - Similar to S3, trace fine gravel
10ft	9-11	S5	7	6	8	16	24	11			S5 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, trace fine subangular gravel, light brown, wet
									2		
15ft	14-14.3	S6	60/3				3	2	3	Sand	S6 - Silty SAND (SM), fine, trace medium, trace coarse, ~25% fines, 10-15% fine gravel, light brown, wet
20ft	19-21	S7	19	24	34	33	24	20			
											S7 - Silty SAND (SM), fine, trace medium, ~25% fines, light brown, wet
	24-26	S8	21	33	36	53	24	24			S8 - Similar to S7, trace fine gravel

Remarks:

1. Ground surface elevations provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," provided to LGCI by Nitsch Engineering, Inc. via email on February 12, 2018.
2. Open hole drive and wash technique used at 14 feet.
3. Drill chattered at 14.3 feet to 17 feet. Encountered possible boulder.

BORING LOG

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth	Sample	Sample	Blows per 6 inches				Pen	Rec	Remarks	Strata	Sample Description
Scale	Depth (ft)	No	0-6	6-12	12-18	18-24	(in)	(in)			
										Sand **~30.8 ft.**	
30 ft	29-30.8	S9	20	100	70	60/4	20	19			S9 - Silty SAND (SM), fine, trace medium, trace coarse, 20-25% fines, trace fine gravel, light brown, wet
											Bottom of boring at 30.8 feet. Backfilled borehole with drill cuttings.
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:

BORING LOG

Boring B-131
Page 1 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	2/21/2018
Drilling Foreman:	Tim Tucker	Date Completed:	2/21/2018
LGCI Engineer:	Tom Sinnott	Location:	NE corner of lower parking lot
Ground Surface El:	749.4 feet (see remark 1)	Total Depth:	27.4 feet
Groundwater Depth:	~25.1 ft. at end of drilling	Drill Rig Type:	Mobile B-48 Track Rig
		Drilling Method:	HSA (3-1/4" ID)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2	S1		8	5	4	18	6		Asphalt	Drilled through 6" of asphalt S1 - Poorly Graded SAND with Gravel (SP) fine, trace medium 0-5% fines, ~15% fine gravel, trace asphalt, brown, moist
	2-4	S2	3	3	2	1	24	1			S2 - Similar to S1
5ft	4-6	S3	1	10	4	2	24	8			S3 - SILT (ML), slightly plastic, 10-15% fine sand, trace peat, trace roots, dark brown, moist
	6-8	S4	3	6	3	7	24	10		Fill	S4 - Silty SAND (SM), fine, 25-30% fines, 5-10% fine gravel, trace organic fines, trace roots, dark brown, moist
	8-10	S5	1	1	2	2	24	6			S5 - Similar to S4
10ft											
	10-12	S6	1	1	9	11	24	15			S6 - Top 9" : Similar to S4 Bot. 6": Silty SAND (SM), fine, ~15% fines, trace fine gravel, gray, moist
										~12 ft.	
	12-14	S7	12	17	20	31	24	15			S7 - Silty SAND (SM), fine, 15-20% fines, trace fine gravel, light brown, moist
15ft											
	15-17	S8	36	37	39	30	24	20			S8 - Similar to S7, trace fine angular gravel
										Sand	
20ft											
	20-22	S9	23	27	17	13	24	16			S9 - Similar to S7

Remarks:
1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," dated March 26, 2018 and provided to LGCI by Nitsch Engineering, Inc. via email on March 28, 2018.

BORING LOG

Boring B-131
Page 2 of 2

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	25-27	S10	19	29	34	32	24	16		Sand ~27.4 ft.	S10 - Similar to S7
	27-27.4	S11	120/5				5	4			S11 - Silty SAND (SM), fine, trace medium, ~25% fines, light brown, wet
30 ft											Bottom of boring at 27.4 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:

APPENDIX C - Logs of LGCI’s Test Pits

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Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/15/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/15/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Western side of lower parking lot
Ground Surface El:	746.5' (see Remark 1)	Total Depth:	8'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	2'11" x 8'

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~1'	0"-1': Silty SAND (SM), fine, ~30% fines, trace of gravel, trace of organics, roots, dark brown, moist
	E	**Silty Sand with Gravel**	1'-8': Silty SAND with Gravel (SM), fine to medium, ~15% fines, 20-25% gravel, light brown, moist See remark 2
	M		
	M		Encountered boulder of ~2' diameter at depth of 4.5'
5 ft	M		
	M		
	M		
	M	**~8'**	
			Bottom of test pit at 8'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
10 ft			
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered cobbles between 8" and 1' in diameter from 1' to 8'.
3. Encountered fabric and crushed stone possibly indicating drainage line. Moved test pit 2' west and 2' north.

Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/15/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/15/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Northern side of lower parking lot
Ground Surface El:	752' (see remark 1)	Total Depth:	13'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	4' x 10'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~11"	0" - 11": Silty SAND (SM), fine, ~30% fines, trace of gravel, organics, roots, dark brown, moist
	M	Fill	11"- 3.3': Poorly graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, ~20% fine gravel, trace of asphalt, light brown, moist
	M		
	M	~3'3'	3.3' - 13': Silty SAND with Gravel (SM), fine to medium, ~20% fines, 15-20% fine gravel, light brown, moist
5 ft	M		
	D		
	D		
	D		
	D	Silty Sand with Gravel	
10 ft	D		
	D		
	D		
		~13'	
			Bottom of test pit at 13'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Sloped location. North side of the test pit is at a higher elevation. Samples were taken on the northern side of the test pit.
3. Natural soil encountered at a depth of 1.5' on the southern side of the test pit.

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TP-3 **Page 1 of 1**

Project:	**Proposed Worcester South High School, Worcester, MA**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service	Date Started:	08/15/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/15/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	South of track
Ground Surface El:	763.5' (see remark 1)	Total Depth:	9'
Groundwater Depth:	9'	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	4' x 10'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~10"	0"- 10": Silty SAND (SM), fine, ~30% fines, trace gravel, organics, grass, roots, dark brown, moist
	M	Fill	10"- 3.2': Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% fine gravel, trace organics, light brown to dark brown, moist See remark 2
	M	~3.2'	
	M	**Silty Sand with Gravel**	3.2' - 9': Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, ~20% fine gravel, light brown, moist
5 ft	M		
	M		
	M		
	M		
	M	**~9'**	Refusal at ~9'
10 ft			Bottom of test pit at 9'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered cobbles and boulders (5-10%) up to 2' in diameter from 1' to 3'.

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TP-4 **Page 1 of 1**

Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/15/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/15/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Wooded area, south of track
Ground Surface El:	763' (see remark 1)	Total Depth:	12.5'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3'4" x 8.5'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil	0"- 1.3': Silty SAND (SM), fine, ~30% fines, trace organics, roots, dark brown, moist
	M	~1.3' Subsoil	1.3' - 2.5': Silty SAND with Gravel (SM), fine, trace coarse, ~25% fines, ~25% fine gravel, light brown, moist
	M	~2.5'	2.5'- 12.5': Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~25% fine gravel, light brown, moist
	M		
5 ft	M		
	M		
	M		
	M	**Silty Sand with Gravel**	
	M		
10 ft	M		
	M		
	M		
	M	**~12.5'**	
			Bottom of test pit at 12.5'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

Project:	**Proposed Worcester South High School, Worcester, MA**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Southern side of track
Ground Surface El:	766' (see remark 1)	Total Depth:	9.5'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3.5' x 10.5'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~11"	0"- 11": Silty SAND (SM), fine, ~35% fines, trace fine gravel, organics, roots, dark brown, moist
	M	Subsoil ~2'	11"- 2': Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% fine to coarse gravel, light brown, moist
	M	Fill	2'-6.1': Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~20% fines gravel, light brown, moist See remark 2 Boulder of ~3' diameter at depth of 3.5'
	M		
5 ft	M		
	M	~6.1'	
	M	Silty Sand	6.1'- 9.5': Silty SAND (SM), fine, ~15% fines, trace of gravel, light brown, moist
	M		
	M		
10 ft	M	~9.5'	Bottom of test pit at 9.5'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered cobbles and boulders up to 2' in diameter from 2' to 6'.

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Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Eastern side of track
Ground Surface El:	766' (see remark 1)	Total Depth:	12.3'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3'2" x 14'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~10"	0"- 10": Silty SAND (SM), fine, ~35% fines, trace fine gravel, dark brown, moist
	M	Fill	10"- 4': Poorly graded SAND with Silt and Gravel (SP-SM), fine to medium, ~10% fines, ~25% gravel, cobbles, light brown, moist Boulder of ~1' diameter at 2'
	M		
	M	~4'	
5 ft	M	Buried Organics	4'- 4.7': Silty SAND (SM), fine, ~30% fines, trace organics, gray to black, moist
	M	**Silty Sand with Gravel**	4.7' - 12.3': Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~10% gravel, light brown, cobbles, moist Boulder of ~1' diameter at 6'
	M		
	M		
	M		
10 ft	M		
	D		
	D		
	D	**~12.3'**	Bottom of test pit at 12.3'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

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Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Western side of track
Ground Surface El:	766' (see remark 1)	Total Depth:	12'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3'9" x 12'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~7"	0"-7": Silty SAND (SM), fine, ~35% fines, trace organics, roots, dark brown, moist
	M	Subsoil ~1.5'	7"- 1.5': Silty SAND (SM), fine to medium, ~15% fines, ~20% gravel, light brown, moist Boulder of 1.5' diameter at depth of 2'
	M		1.5'- 8': Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~25% fine gravel, light brown, moist (Top 2' appeared reworked. Possible Fill)
	M		
5 ft	M		
	M		
	M	**Silty Sand with Gravel**	
	M		
	M		8' - 12': Silty SAND with Gravel (SM), fine to medium, 20-25 % fines, ~25% fine gravel, light brown, moist
10 ft	M		
	M		
	M	~12'	
			Bottom of test pit at 12'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

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Project:	**Proposed Worcester South High School, Worcester, MA**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Northwestern corner of track
Ground Surface El:	766' (see remark 1)	Total Depth:	10.8'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3'2" x 10'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~8"	0" - 8": Silty SAND (SM), fine, ~30% fines, trace organics, roots, dark brown, moist
	M	Subsoil ~2.1'	8" - 2.1': Poorly graded SAND with Silt & Gravel (SP-SM), fine to medium, 10-15% fines, ~15% gravel, trace organics, roots, light brown, moist
	M		2.1' - 10.8': Poorly graded SAND with Silt & Gravel (SP-SM), fine, 10-15% fines, 10-15% fine gravel, light brown, moist See remark 2
	M		
5 ft	M		
	M	**Sand with Silt and Gravel**	
	M		
	M		
	M		
10 ft	M		
	M	**~10.8'**	
			Bottom of test pit at 10.8'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered cobbles and boulders (<5%) up to 1' in diameter from 1' to 10.8'.

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Project:	**Proposed Worcester South High School, Worcester, MA**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Northeastern corner of track
Ground Surface El:	766' (see remark 1)	Total Depth:	12.7'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3' x 5.5'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~1'	0" - 1': Silty SAND (SM), fine, ~35% fines, trace organics, roots, dark brown, moist
	M	Subsoil ~2'	1' - 2': Silty SAND (SP-SM), fine, ~20% fines, light brown, moist
	M	Fill	2' - 4': Silty SAND with Gravel (SM), fine, 20-25% fines, 15-20% fine gravel, 6"-12" angular cobbles, trace roots, trace organic fines, light brown, moist
	M	~4'	
5 ft	M		4' - 12.7': Silty SAND with Gravel (SM), fine, 20-25% fines, 15-20% fine gravel, light brown, moist
	M		
	M		
	M	Silty Sand with Gravel	
	M		
10 ft	M		
	M		
	M		
	M	~12.7'	
			Bottom of test pit at 12.7'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

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Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Athletic field NW of existing building
Ground Surface El:	767' (see remark 1)	Total Depth:	9.8'
Groundwater Depth:	8.7' Water seeped in the excavation	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3' x 9.5'

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~7"	0"- 7": Silty SAND (SM), fine, ~30% fines, trace organics, roots, dark brown, moist
	E	Subsoil ~2'	7"- 2': Poorly graded SAND with Gravel (SP), fine to medium, ~20% fine gravel, light brown, moist See remark 2
	E	Silty Sand and Gravel	2'- 9.8': Silty SAND with Gravel (SM), fine to medium, 15-20% fines, ~15% fine gravel, light brown, moist
	E		
5 ft	E		
	E		
	E		
	E		
	E		
10 ft	E	~9.8'	
			Bottom of test pit at 9.8'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered cobbles and boulders up to 1' in diameter starting at 1'.

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Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Athletic field NW of existing building
Ground Surface El:	767.5' (see remark 1)	Total Depth:	9.4'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3'2" x 8'5"

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~10"	0"-10": Silty SAND (SM), fine, ~35% fines, trace organics, roots, dark brown, moist
	M	Fill	10"-5': Silty SAND with Gravel (SM), fine to medium, ~10-15% fines, ~20% gravel, trace organics, roots, light brown, moist See remark 2 Boulder of 1' in diameter encountered at 1.5'
	M		
	M		
5 ft	M	~5'	
	M	Buried Topsoil ~6'	5'- 6': Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% gravel, trace roots and wood, gray, moist
	M	**Silty Sand with Gravel**	6' - 9.4': Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% gravel, gray, moist Boulder of 1' in diameter encountered at 7.5'
	M		
	M		
10 ft	M	**~9.4'**	Bottom of test pit at 9.4'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.
2. Encountered cobbles and boulders up to 1' in diameter below the depth of 1.5'.

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Project:	**Proposed Worcester South High School, Worcester, MA**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	Athletic field NW of existing building
Ground Surface El:	769' (see remark 1)	Total Depth:	10'
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3.5' x 7.5'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil	0"- 7": Silty SAND (SM), fine, ~35% fines, trace organics, roots, dark brown, moist
	M	Fill ~2.1'	7"- 2.1': Poorly graded SAND with Silt & Gravel (SP-SM), fine to medium, ~10% fines, ~25 gravel, trace trash, light brown, moist Angular boulders of ~2' in diameter encountered at 1'
	M		2.1' - 10': Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% gravel, light brown, moist
	M		
5 ft	M		
	M		
	M	Sand with Gravel	
	M		
	M		
10 ft	M	~10'	
			Bottom of test pit at 10'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

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Project:	**Proposed Worcester South High School, Worcester, MA**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service	Date Started:	08/14/17
Excavation Foreman:	Dave Edilberti	Date Completed:	08/14/17
LGCI Engineer:	Hadi Kazemiroodsari	Location:	West of existing building
Ground Surface El:	769.5' (see remark 1)	Total Depth:	10.1'
Groundwater Depth:	~10' Water seeped in from the bottom of excavation	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	4' x 9'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~1.5'	0" - 1.5': Silty SAND (SM), fine, ~35% fines, trace organics, roots, dark brown, moist
	M	Fill ~6.5'	1.5' - 3': Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~20% gravel, light brown, moist
	M		
	M		3' - 6.5': SILT with Sand and Gravel (ML), highly plastic, 25-30% fine sand, ~10% gravel, possible traces of coal ash, ~5% angular to subangular cobbles and boulders, gray, moist (possible stone dust)
5 ft	M		
	M		
	M	Silt with Sand and Gravel ~10.1'	6.5' - 10.1': SILT with Sand and Gravel (ML), plastic, 25-30% fine sand, ~10% gravel, light brown, moist
	M		
	M		
10 ft	M		
	M		Bottom of test pit at 10.1'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

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Project:	**Proposed Worcester South High School, Worcester, MA**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Excavation Subcontractor: Northern Drill Service
Excavation Foreman: Dave Edilberti
LGCI Engineer: Hadi Kazemiroodsari
Date Started: 08/15/17
Date Completed: 08/15/17
Location: North of existing building
Ground Surface El: 766' (see remark 1)
Groundwater Depth: NE
Total Depth: 10'
Excavator Type: Komatsu PC-120
Test Pit Dimensions: 3' x 9'

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~10"	0"-10": Silty SAND (SM), fine, ~30% fines, trace organics, roots, dark brown, moist
	M	Fill	10"-1.5': Silty SAND with Gravel (SM), fine to medium, ~15% fines, ~20% gravel, light brown, moist
	M		1.5'- 4': Silty SAND with Gravel (SM), fine, ~20% fines, ~15% gravel, angular cobbles and boulders up to 18", light brown, moist
	M	~4'	
5 ft	M		4'- 10': Silty SAND with Gravel (SM), fine, ~20% fines, ~15% gravel, light brown, moist
	M		
	M	**Silty Sand with Gravel**	
	M		
	M		
10 ft	M	**~10'**	
			Bottom of test pit at 10'. Backfilled with excavated material in 2' lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation interpolated to the nearest 1/2 foot from progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/13/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/14/18
LGCI Engineer:	Malinda Chea	Location:	NE corner of northern athletic field
Ground Surface El:	~765.9 ft. (see remark 1)	Total Depth:	13 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	8 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	**Topsoil** **~1 ft.**	0" - 1' : Silty SAND (SM), fine, 25-30% fines, trace organic fines, trace roots, dark brown, moist
	E		1' - 7' : Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 15-20% fine to coarse subangular gravel, light brown, moist
	E		
	E	**Fill**	
5 ft	E		
	E		
	E	**~7 ft.**	
	E		7' - 13' : Silty SAND (SM), fine, trace medium, 15-20% fines, 10-15% fine gravel, orange to brown, moist
	E		
10 ft	E	**Sand**	
	E		
	E		
	E	**~13 ft.**	
			Bottom of test pit at 13 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Infiltration test was performed at a depth of 3 feet.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/12/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/12/18
LGCI Engineer:	Tom Sinnott	Location:	Southern edge of northern athletic field
Ground Surface El:	~766.4 ft. (see remark 1)	Total Depth:	12.5 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5 ft. x 12.5 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil	0" - 1.3' : Silty SAND with Gravel (SM), fine, trace medium, 20-25% fines, ~15% fine gravel, trace of organic fines, trace roots, dark brown, moist
	M	~1.3 ft.	1.3' - 2' : Silty SAND (SM), fine, trace medium, ~15% fines, ~5% fine gravel, trace roots, brown, moist
	M		2' - 6' : Silty SAND (SM), fine to medium, trace coarse, 45-50% fines, 5-10% fine subangular gravel, trace roots, trace organic fines, brown, moist
	M	Fill	
5 ft	M		
	M	~6 ft.	
	D		6' - 12.5' : Silty SAND with Gravel (SM), fine, trace medium, ~20% fines, 25-30% fine gravel, light brown, moist
	D		
	D	Sand	
10 ft	D		
	D		
	D		
	D	~12.5 ft.	
			Bottom of test pit at 12.5 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/12/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/12/18
LGCI Engineer:	Tom Sinnott	Location:	Northern athletic field
Ground Surface El:	~767.0 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	D	**Topsoil**	0" - 1.3' : Silty SAND (SM), fine, trace medium, trace coarse, 5-10% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	M	**~1.3 ft.**	1.3' - 2.1' : Silty SAND with Gravel (SM), fine, trace medium, ~20% fines, 20-25% fine angular gravel, trace of organic fines, brown, moist
	M		2.1' - 5' : Silty SAND with Gravel (SM), fine, ~20% fines, 25-30% fine gravel, light brown, moist
	M	**Fill**	
5 ft	M	**~5 ft.**	
	D		5' - 12' : Silty SAND (SM), fine, trace medium, 15-20% fines, ~5% fine gravel, light brown, moist
	D		
	D		
	D	**Sand**	
10 ft	D		
	D		
	D	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/12/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/12/18
LGCI Engineer:	Tom Sinnott	Location:	Northern edge of northern athletic field
Ground Surface El:	~766.0 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	6 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	**Topsoil ~0.7 ft.**	0" - 0.7' : Silty SAND with Gravel (SM), fine, ~25% fines, ~20% fine angular gravel, trace of organic fines, trace roots, trace grass, dark brown, moist
	M	**Fill ~2 ft.**	0.7' - 2' : Silty SAND with Gravel (SM), fine, trace medium, ~20% fines, 15-20% fine gravel, trace of organic fines, brown, moist
	D		2' - 12' : Silty SAND (SM), fine, 15-20% fines, ~5% fine gravel, light brown, moist
	D		Encountered boulders up to 2.5 feet in diameter.
5 ft	D		
	D		
	D		
	D	**Sand**	
	D		
	D		
10 ft	D		
	D	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/13/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/22/18
LGCI Engineer:	Malinda Chea	Location:	Southern edge of northern athletic field
Ground Surface El:	~766.0 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	~9 ft. water seeped in	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3.3 ft. x 13.3 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	D	**Topsoil ~0.8 ft.**	0" - 0.8' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, frozen
	M	**Fill**	0.8' - 5': Silty SAND with Gravel (SM), fine, ~20% fines, 20-25% fine to coarse angular gravel, 5-10% cobbles, trace roots, light brown, moist Encountered ~5% boulders up to 1.5 feet in diameter.
	M		
	M		
5 ft	M	**~5 ft.**	
	M	**Sand and Gravel**	5' - 9' : Silty SAND with Gravel (SM), fine, ~20% fines, 15-20% fine to coarse gravel, 0-5% cobbles, light brown, moist
	M		
	M		
	M		
10 ft	M		9' - 12' : Silty SAND with Gravel (SM), fine, ~20% fines, 20-25% fine gravel, light brown, wet
	M		
	M	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Infiltration test was performed at a depth of 3 feet at the staked location. Due to rain water pooling over the weekend the test pit was moved 5 feet east of the staked location.
3. A pocket of buried organic soil was observed on the western edge of the test pit at a depth ranging from 3.5 feet to 4.5 feet.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/12/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/12/18
LGCI Engineer:	Tom Sinnott	Location:	Northern edge of northern athletic field
Ground Surface El:	~766.5 ft. (see remark 1)	Total Depth:	11 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	**Topsoil ~0.9 ft.**	0" - 0.9': Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, frozen
	M	**Fill ~2 ft.**	0.9'- 2' : Silty SAND (SM), fine, 15-20% fines, ~5% fine angular gravel, trace of organic fines, trace roots, brown, moist
	D		2' - 11' : Silty SAND (SM), fine, ~20% fines, 5-10% fine gravel, light brown, moist
	D		
5 ft	D		
	D		Encountered boulders 1 foot in diameter.
	D	**Sand with Gravel**	
	D		
	D		
10 ft	D		
	D	**~11 ft.**	
			Bottom of test pit at 11 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/12/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/12/18
LGCI Engineer:	Tom Sinnott	Location:	Center of northern athletic field
Ground Surface El:	~767.1 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	4.5 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	**Topsoil ~0.7 ft.**	0" - 0.7' : Silty SAND with Gravel (SM), fine, ~30% fines, ~25% fine gravel, trace of organic fines, trace roots, dark brown, wet
	M	**Fill ~1.9 ft.**	0.7' - 1.9' : Silty SAND with Gravel (SM), fine, trace medium, ~20% fines, 30-35% fine to coarse angular gravel, brown, moist
	D		1.9' - 12' : Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, 10-15% fines, ~20% fine to coarse gravel, light brown, moist
	D		
5 ft	D		
	D		
	D	**Sand with Gravel**	
	D		
	D		
10 ft	D		
	D		
	D	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/13/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/13/18
LGCI Engineer:	Malinda Chea	Location:	Eastern edge of playing field
Ground Surface El:	~769.0 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3 ft. x 9.9 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~0.8 ft.	0" - 0.8' : Silty SAND (SM), fine, ~30% fines, trace of organic fines, trace roots, dark brown, frozen
	M	Fill	0.8' - 3.5' : Silty SAND with Gravel (SM), fine, 15-20% fines, 20-25% fine to coarse angular gravel, trace roots, light brown, moist
	M		
	M	~3.5 ft.	3.5' - 12' : Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, 10-15% fines, 15-20% fine subangular gravel, light brown, moist
5 ft	M		
	M		
	M		
	M	Sand with Gravel	
	M		
10 ft	M		
	M		
	M	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project: **Proposed Worcester South High School, Worcester, Massachusetts**	
Client: **Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644
Excavation Subcontractor: Northern Drill Service, Inc.	Date Started: 02/13/18
Excavation Foreman: Dave Edilberti	Date Completed: 02/13/18
LGCI Engineer: Malinda Chea	Location: NE corner of playing field
Ground Surface El: ~767.1 ft. (see remark 1)	Total Depth: 12 feet
Groundwater Depth: ~8.8 ft. water seeped in	Excavator Type: Komatsu PC-120
	Test Pit Dimensions: 4 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	D	Topsoil ~0.8 ft.	0" - 0.8' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, frozen
	M	Fill	0.8' - 5' : Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, 30-35% fine to coarse angular gravel, trace roots, light brown moist Encountered rebar from 1 to 1.5 feet. Encountered ~5% cobbles/boulders up to 1 foot in diameter.
	M		
	M		
5 ft	M	~5 ft.	
	M	Sand and Gravel	5' - 12' : Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, ~20% fine gravel, light brown, moist
	M		
	M		
	M		
10 ft	M		
	M		
	M	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project: **Proposed Worcester South High School, Worcester, Massachusetts**	
Client: **Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644
Excavation Subcontractor: Northern Drill Service, Inc.	Date Started: 02/12/18
Excavation Foreman: Dave Edilberti	Date Completed: 02/12/18
LGCI Engineer: Tom Sinnott	Location: Eastern edge of northern athletic field
Ground Surface El: ~767.0 ft. (see remark 1)	Total Depth: 12 feet
Groundwater Depth: NE	Excavator Type: Komatsu PC-120
	Test Pit Dimensions: 5 ft. x 11 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	**Topsoil ~1 ft.**	0" - 1' : Silty SAND (SM), fine, 25-30% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	M	**Fill**	1' - 4' : Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, ~10% fine gravel, trace roots, light brown moist
	M		
	M	**~4 ft.**	
5 ft	D	**Sand**	4' - 12' : Silty SAND (SM), fine, 15-20% fines, 5-10% fine gravel, light brown, moist Encountered boulders up to 2 feet in diameter.
	D		
	D		
	D		
	D		
10 ft	D		
	D		
	D	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project: **Proposed Worcester South High School, Worcester, Massachusetts**	
Client: **Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644
Excavation Subcontractor: Northern Drill Service, Inc.	Date Started: 02/12/18
Excavation Foreman: Dave Edilberti	Date Completed: 02/12/18
LGCI Engineer: Tom Sinnott	Location: NE corner of northern athletic field
Ground Surface El: ~766.3 ft. (see remark 1)	Total Depth: 12 feet
Groundwater Depth: NE	Excavator Type: Komatsu PC-120
	Test Pit Dimensions: 5 ft. x 12 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	**Topsoil ~0.8 ft.**	0" - 0.8' : Silty SAND (SM), fine, ~20% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	M	**Fill**	0.8' - 5' : Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 30-35% fine to coarse subangular gravel, trace of organic fines, brown moist
	M		
	M		
5 ft	M	**~5 ft.**	
	M	**Buried Topsoil**	5' - 7' : Silty SAND (SM), fine, ~25% fines, 10-15% fine to coarse gravel, trace of organic fines, trace roots, trace wood, dark brown, moist
	M	**~7 ft.**	
	D	**Sand**	7' - 12' : Silty SAND (SM), fine, trace medium, 15-20% fines, ~5% fine gravel, light brown, moist Encountered boulders up to 3 feet in diameter.
	D		
10 ft	D		
	D		
	D	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
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Project: **Proposed Worcester South High School, Worcester, Massachusetts**

Client: **Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/14/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/14/18
LGCI Engineer:	Malinda Chea	Location:	West of the existing lower parking lot
Ground Surface El:	~752.5 ft. (see remark 1)	Total Depth:	8.5 feet
Groundwater Depth:	~3.5 ft. water seeped in	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	7 ft. x 11 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil	0" - 3.5' : Silty SAND (SM), fine, 25-30% fines,~10% fine gravel, 0-5% cobbles, trace of organic fines, trace roots, trace wood, dark brown, moist Encountered ~5% boulders up to 1.5 feet in diameter. Encountered 3 boulders that were up to 4 feet in diameter.
	D		
	D		
	D	~3.5 ft.	
5 ft	M	Fill	3.5' - 8' : Silty SAND (SM), fine, ~20% fines, 10-15% fine to coarse gravel, trace of organic fines, trace wood piece, gray to brown, moist Encountered ~5% cobbles and boulders up to 1 foot in diameter.
	M		
	M		
	M	~8 ft.	
	M	Sand ~8.5 ft.	8' - 8.5' : Silty SAND (SM), fine, 25-30% fines, gray, moist
10 ft			Bottom of test pit at 8.5 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. The test pit was terminated at a depth of 8.5 feet due to soil collapsing along the walls of the excavation as water pooled inside the test pit.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/13/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/13/18
LGCI Engineer:	Malinda Chea	Location:	Eastern edge of existing lower parking lot
Ground Surface El:	~748.0 ft. (see remark 1)	Total Depth:	14 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5 ft. x 10 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~1.5 ft.	0" - 1.5' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, moist
	E	Fill ~10 ft.	1.5' - 10' : Silty SAND with Gravel (SM), fine, ~20% fines, 15-20% fine angular gravel, trace brick, light brown, moist Encountered ~5% boulders up to 2 feet in diameter.
	M		
	M		
5 ft	M		
	M		
	M		
	M		
	M		
10 ft	M		
	M	Buried Topsoil ~12 ft.	10' - 12' : Silty SAND (SM), fine, ~30% fines, trace of organic fines, trace roots, dark brown, moist
	M		
	M	Sand ~14 ft.	12' - 14' : Silty SAND (SM), fine to medium, trace coarse, ~15% fines, 5-10% fine gravel, light brown, moist
	M		
15 ft			Bottom of test pit at 14 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/13/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/13/18
LGCI Engineer:	Malinda Chea	Location:	Eastern edge of existing lower parking lot
Ground Surface El:	~744.6 ft. (see remark 1)	Total Depth:	14 feet
Groundwater Depth:	~3.5 ft. water seeped in	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	7 ft. x 11 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil	0" - 1.5' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, moist
	E	~1.5 ft.	
	D		1.5' - 3.5' : Silty SAND with Gravel (SM), fine, 15-20% fines, ~15% fine angular gravel, light brown, moist
	D		3.5' - 12' : Silty SAND with Gravel (SM), fine, 20-25% fines, ~15% fine to coarse subangular gravel, gray to brown, moist
5 ft	M		Encountered ~5% cobbles and boulders up to 1.5 feet in diameter.
	M		
	M	Fill	
	M		
	D		
10 ft	D		
	D		
	D	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. The test pit was terminated at a depth of 12 feet due to encountering a large boulder that was difficult to remove.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/13/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/13/18
LGCI Engineer:	Malinda Chea	Location:	Eastern edge of playing field
Ground Surface El:	~768.7 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	~10.5 ft. water seeped in	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5.5 ft. x 12 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~0.8 ft.	0" - 0.8' : Silty SAND (SM), fine, 25-30% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	E	Fill	0.8' - 3' : Silty SAND with Gravel (SM), fine, trace medium, ~20% fines, 20-25% fine gravel, trace roots, trace wood, trace brick, light brown, moist Encountered ~5% cobbles and boulders up to 1 foot in diameter.
	E	~3 ft.	
	M	Sand and Gravel	3' - 12' : Silty SAND with Gravel (SM), fine, ~15% fines, 15-20% fine gravel, 0-5% cobbles, light brown, moist Encountered ~5% boulders 1 foot in diameter.
5 ft	M		
	M		
	M		
	M		
	M		
10 ft	M		
	M		10.5' - 12' : Silty SAND with Gravel (SM), fine, 15-20% fines, 15-20% fine gravel, orange to light brown, wet
	M	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Infiltration test was performed at a depth of 3 feet.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Excavation Subcontractor:	Date Started:
Excavation Foreman:	Date Completed:
LGCI Engineer:	Location:
Ground Surface El:	Total Depth:
Groundwater Depth:	Excavator Type:
	Test Pit Dimensions:

Depth Scale	Exc. Effort	Strata	Soil Description
			Test pit TP-116 was not performed due to conflicts with water line.
5 ft			
10 ft			
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/22/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/22/18
LGCI Engineer:	Malinda Chea	Location:	SE corner of playing field
Ground Surface El:	~769.7 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	~10.5 ft. water seeped in	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3.5 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~1 ft.	0" - 1' : Silty SAND (SM), fine, 25-30% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	E	Fill	1' - 3.5' : Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, 15-20% fines, trace roots, trace wood, light brown, moist
	M		
	M	~3.5 ft.	
5 ft	M	Sand	3.5' - 4' : Silty SAND (SM), fine, ~30% fines, gray, moist 4' - 10.5' : Silty SAND with Gravel (SM), fine, 15-20% fines, 15-20% fine gravel, 5-10% cobbles up to 8 inch in diameter, light brown, moist
	M		
	M		
	M		
	M		
10 ft	M		
	M		10' - 12' : Silty SAND with Gravel (SM), fine, 15-20% fines, 20-25% fine gravel, ~5% cobbles up to 8 inch in diameter, light brown, wet
	M	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/22/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/22/18
LGCI Engineer:	Malinda Chea	Location:	Near SW corner of existing school
Ground Surface El:	~774.5 ft. (see remark 1)	Total Depth:	9.5 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5 ft. x 12 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	M	Topsoil ~0.5 ft.	0" - 0.5' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, moist
	D		0.5' - 9.5' : Silty SAND with Gravel (SM), fine, trace medium, trace coarse, 15-20% fines, 20-25% fine angular gravel, light brown, moist
	D		
	D		
5 ft	M		
	M	Fill	
	M		
	M		
	M		
10 ft	M	~9.5 ft.	
			Bottom of test pit at 9.5 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Infiltration test was performed at a depth of 3 feet.
3. Encountered a water line at 9.5 feet.

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Project: **Proposed Worcester South High School, Worcester, Massachusetts**	
Client: **Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644
Excavation Subcontractor: Northern Drill Service, Inc. Excavation Foreman: Dave Edilberti LGCI Engineer: Malinda Chea	Date Started: 02/23/18 Date Completed: 02/23/18 Location: Bottom of slope south of the existing school
Ground Surface El: ~783.9 ft. (see remark 1) Groundwater Depth: ~1.5 ft. water seeped in	Total Depth: 12 feet Excavator Type: Komatsu PC-120 Test Pit Dimensions: 3 ft. x 10 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~1 ft.	0" - 1' : Silty SAND (SM), fine, ~30% fines, trace of organic fines, trace roots, dark brown, moist
	M	Fill	1' - 3' : Silty SAND with Gravel (SM), fine, trace medium, ~15% fines, 20-25% fine gravel, light brown, moist
	M	~3 ft.	
	M		3' -6' : Silty SAND (SM) fine, trace medium, 20-25% fines, 5-10% fine gravel, ~5% cobbles up to 6 inch in diameter, light brown, moist
5 ft	M		
	M		
	D		6' - 12' : Silty SAND (SM), fine, trace medium, trace coarse, 25-30% fines, 5-10% fine gravel, trace cobbles up to 6 inch in diameter, gray, moist
	D	Sand	
	D		
10 ft	D		
	D		
	D	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/23/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/23/18
LGCI Engineer:	Malinda Chea	Location:	Island east of the existing school entrance
Ground Surface El:	~786.8 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	4 ft. x 13 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil	0" - 2.5' : Silty SAND (SM), fine, ~30% fines, trace fine gravel, trace of organic fines, trace roots, trace grass, dark brown, moist
	E		
	E	~2.5 ft.	
	M	Fill	2.5' - 5' : Silty SAND (SM), fine to medium, 40-45% fines, 5-10% fine angular gravel, trace roots, light brown, moist
5 ft	M	~5 ft.	
	M	Sand and Gravel	5' - 12' : Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 20-25% fine to coarse subrounded gravel, ~5% cobbles up to 6 inch in diameter, light brown, moist
	M		
	M		
	M		
10 ft	M		
	D		Encountered ~5% boulders up to 1.5 feet in diameter.
	D	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/26/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/26/18
LGCI Engineer:	Andrew Jefferson	Location:	Island east of the existing school entrance
Ground Surface El:	~784.0 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	6 ft. x 10 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	**Topsoil**	0" - 2' : Silty SAND (SM), fine to medium, 35-40% fines, trace fine gravel, trace of organic fines, trace roots, leaves, dark brown, moist
	E	**~2 ft.**	
	M	**Fill ~3 ft.**	2.5' - 5' : Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine gravel, ~5% cobbles up to 6 inch in diameter, trace brick, brown, moist
	D		3' - 12' : Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 30-35% fine to coarse subangular gravel, ~5% cobbles/ boulders up to 4 feet in diameter, light brown, moist
5 ft	D		
	D		
	D		
	D	**Sand and Gravel**	
	D		
10 ft	D		
	D		
	D	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Infiltration test was performed at a depth of 3 feet.

LGCI
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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**		LGCI Project No.: 1644
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/23/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/23/18
LGCI Engineer:	Malinda Chea	Location:	Lawn east of existing school entrance
Ground Surface El:	~784.2 ft. (see remark 1)	Total Depth:	8.5 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	4 ft. x 10 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil	0" - 1.5' : Silty SAND (SM), fine, 25-30% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	E	~1.5 ft.	
	E	▨	1.5' - 8.5' : Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, 20-25% fine gravel, ~5% cobbles up to 6 inch in diameter, trace brick, trace concrete, trace construction debris, light brown, moist
	M	▨	
5 ft	M	▨	Encountered ~5% boulders up to 1.5 feet in diameter.
	M	Fill	
	M	▨	
	M	▨	
	M	~8.5 ft.	
10 ft			Bottom of test pit at 8.5 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Excavator teeth punctured through a water line pipe at 8.5 feet.

Lahlaf Geotechnical Consulting, Inc.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**	
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644

Excavation Subcontractor:	Date Started:
Excavation Foreman:	Date Completed:
LGCI Engineer:	Location:
Ground Surface El:	Total Depth:
Groundwater Depth:	Excavator Type:
	Test Pit Dimensions:

Depth Scale	Exc. Effort	Strata	Soil Description
			Test pit TP-123 was not performed due to conflicts with water line.
5 ft			
10 ft			
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

Lahlaf Geotechnical Consulting, Inc.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor: Northern Drill Service, Inc.	Date Started: 02/22/18
Excavation Foreman: Dave Edilberti	Date Completed: 02/22/18
LGCI Engineer: Malinda Chea	Location: Slope south of the existing school
Ground Surface El: ~789.7 ft. (see remark 1)	Total Depth: 12 feet
Groundwater Depth: ~5 ft. water seeped in	Excavator Type: Komatsu PC-120
	Test Pit Dimensions: 3 ft. x 11 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~1 ft.	0" - 1' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, moist
	M		1' - 7' : Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 30-35% fine to coarse subrounded gravel, 5-10% cobbles up to 8 inch in diameter, trace organic fines, trace brick, trace wood, trace roots, light brown, moist
	M		
	M		
5 ft	M	Fill	Encountered ~5% boulders up to 2 feet in diameter.
	M		
	M	~7 ft.	
	D		7' - 12' : Silty SAND (SM), fine, trace medium, ~30% slightly plastic fines, ~10% fine subrounded gravel, brown to gray, moist
	D		
10 ft	D	Sand	
	D		
	D	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. Observed a boulder with a diameter of 6.5 feet embedded in the surface at the side of the test pit.

Lahlaf Geotechnical Consulting, Inc.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/22/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/22/18
LGCI Engineer:	Malinda Chea	Location:	Slope south of the existing school
Ground Surface El:	~789.5 ft. (see remark 1)	Total Depth:	12.5 feet
Groundwater Depth:	~1.5 ft. water seeped in	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	2.5 ft. x 14 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	**Topsoil**	0" - 1.5' : Silty SAND (SM), fine, 25-30% fines, trace of organic fines, trace roots, dark brown, moist
	E	**~1.5 ft.**	1.5' - 3' : Silty SAND (SM), fine, trace medium, ~15% fines, 5-10% fine gravel, light brown, wet
	E		
	M		3' - 7' : Silty SAND with Gravel (SM), fine, ~30% fines, 20-25% fine gravel, brown to gray, moist
5 ft	M		
	M		
	M		
	D	**Sand**	7' - 12.5' : Silty SAND (SM), fine, trace medium, 20-25% fines, gray, moist Encountered ~5% boulders up to 1.5 feet in diameter.
	D		
10 ft	D		
	D		
	D		
	D	**~12.5 ft.**	
			Bottom of test pit at 12.5 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.

Lahlaf Geotechnical Consulting, Inc.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.: 1644	
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/26/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/26/18
LGCI Engineer:	Malinda Chea	Location:	Wooded area at NE corner of athletic field
Ground Surface El:	~761.9 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	5 ft. x 10.3 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil ~2.8 ft.	0" - 2.8' : Silty SAND (SM), fine, ~30% fines, trace fine gravel, trace of organic fines, trace roots, trace grass, dark brown, moist
	E		
	M		
	M	Subsoil ~5.8 ft.	2.8' - 5.8' : Silty SAND with Gravel (SM), fine, 20-25% fines, ~20% fine gravel, trace of organic fines, trace roots, orange to brown, moist
5 ft	M		
	M		
	M	Sand ~12 ft.	5.8' - 12' : Silty SAND with Gravel (SM), fine, trace medium, ~15% fines, 30-35% fine to coarse gravel, ~5% cobbles up to 6 inch in diameter, light brown, moist
	M		Encountered ~5% boulders up to 1.5 feet in diameter from 6 feet to 10 feet.
	M		
10 ft	D		
	D		Encountered ~10% boulders up to 3.5 feet in diameter from 10 feet to 12 feet.
	D		
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. The test pit was terminated at a depth of 12 feet due to encountering a large boulder that was difficult to remove.

Project:	**Proposed Worcester South High School, Worcester, Massachusetts**		
Client:	**Lamoureux Pagano & Associates, Inc.**	LGCI Project No.:	1644
Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/23/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/23/18
LGCI Engineer:	Malinda Chea	Location:	Wooded area east of northern athletic field
Ground Surface El:	~749.0 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	8 ft. x 9.3 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	**Topsoil ~0.5 ft.**	0" - 0.5' : Silty SAND (SM), fine, ~30% fines, trace fine gravel, trace of organic fines, trace roots, trace grass, dark brown, moist
	M	**Subsoil**	0.5' - 2.5' : Silty SAND with Gravel (SM), fine, trace medium, 20-25% fines, ~20% fine to coarse gravel, trace of organic fines, trace roots, tan, moist
	M	**~2.5 ft.**	
	D		2.5' - 12' : Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, 15-20% fine gravel, 5-10% cobbles, light brown, moist
5 ft	D		Encountered ~5% boulders up to 3 feet in diameter from 3 feet to 8 feet.
	D		
	D		
	D	**Sand and Gravel**	
	M		
10 ft	M		
	M		
	M	**~12 ft.**	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. The topsoil layer may not be representative as the area was cleared of trees before the test pit was excavated.

Lahlaf Geotechnical Consulting, Inc.

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Project:	**Proposed Worcester South High School, Worcester, Massachusetts**
Client:	**Lamoureux Pagano & Associates, Inc.** LGCI Project No.: 1644

Excavation Subcontractor:	Northern Drill Service, Inc.	Date Started:	02/23/18
Excavation Foreman:	Dave Edilberti	Date Completed:	02/23/18
LGCI Engineer:	Malinda Chea	Location:	Wooded area east of northern athletic field
Ground Surface El:	~751.4 ft. (see remark 1)	Total Depth:	12 feet
Groundwater Depth:	NE	Excavator Type:	Komatsu PC-120
		Test Pit Dimensions:	3 ft. x 10 ft.

Depth Scale	Exc. Effort	Strata	Soil Description
	E	Topsoil	0" - 1.5' : Silty SAND (SM), fine, 25-30% fines, trace fine gravel, trace of organic fines, trace roots, dark brown, moist
	M	~1.5 ft.	
	M	Subsoil	1.5' - 3.3' : Silty SAND (SM), fine, 20-25% fines, 5-10% fine gravel, trace of organic fines, trace roots, tan, moist
	D	~3.3 ft.	
5 ft	D		3.3' - 12' : Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, ~15% fine subrounded gravel, ~5% cobbles up to 6 inch in diameter, trace boulders up to 1 foot in diameter, light brown, moist
	D		
	D		
	D	Sand and Gravel	
	M		
10 ft	M		
	M		
	M	~12 ft.	
			Bottom of test pit at 12 feet. Backfilled test pit with excavated material in 1 foot lifts and compacted with excavator bucket.
15 ft			

Remarks: E = Easy, M = Moderate, D = Difficult, V = Very Difficult

1. Ground surface elevation provided in a drawing titled: "Boring Location Plan, South High Community School, Worcester, Massachusetts," and dated February 12, 2018. Drawing provided to LGCI from Nitsch Engineering, Inc. via email on February 12, 2018.
2. The topsoil layer may not be representative as the area was cleared of trees before the test pit was excavated.

APPENDIX D – Double Ring Infiltrometer Tests

Double Ring Infiltrometer Test

Project:	Name:	Proposed Worcester South High School
	Location:	Worcester, MA
	LGCI Project Number:	1644

Test Location: TP-101-IT

Test Procedure: General accordance with ASTM D 3385

Test Date 2/13/2018

LGCI Representative: Andrew Jefferson

Weather Conditions: Sunny, 35 degrees

Test Depth: 3 feet

Groundwater Depth: NA

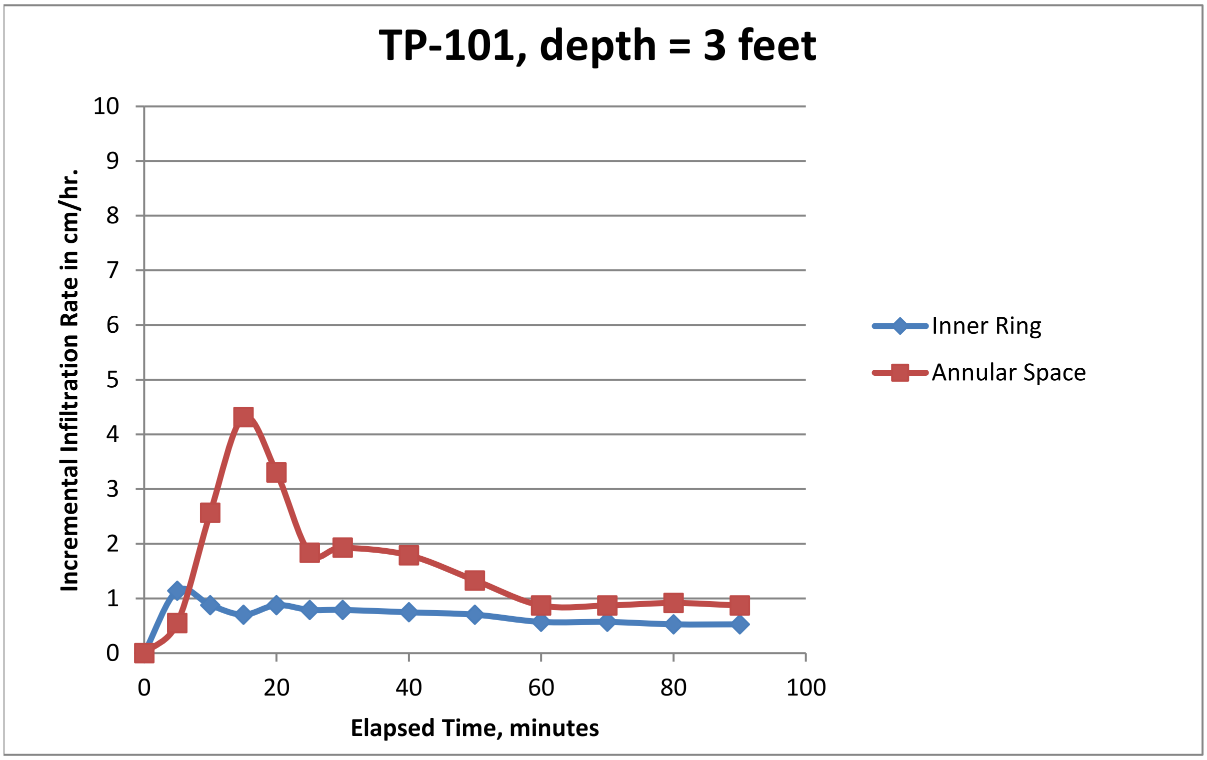
Soil Stratum: Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 15-20% fine to coarse subangular gravel, light brown, moist

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	4	6
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	58	0	0	58.0	0	0
5	5	56.7	70	1.1	57.4	101	0.6
10	5	55.7	54	0.9	54.6	469	2.6
15	5	54.9	43	0.7	49.9	787	4.3
20	5	53.9	54	0.9	46.3	603	3.3
25	5	53	48	0.8	44.3	335	1.8
30	5	52.1	48	0.8	42.2	352	1.9
40	10	50.4	91	0.7	38.3	653	1.8
50	10	48.8	86	0.7	35.4	486	1.3
60	10	47.5	70	0.6	33.5	318	0.9
70	10	46.2	70	0.6	31.6	318	0.9
80	10	45	64	0.5	29.6	335	0.9
90	10	43.8	64	0.5	27.7	318	0.9

Notes:

1. Began saturation at about 1:15 PM and began test at 1:45 PM.


TP-101, depth = 3 feet
Incremental Infiltration Rate in cm/hr.
10
9
8
7
6
5
4
3
2
1
0
0
20
40
60
80
100
Elapsed Time, minutes
Inner Ring
Annular Space

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project:

Name:	Proposed Worcester South High School
Location:	Worcester, MA
LGCI Project Number:	1644

Test Location: TP-105-IT

Test Procedure: General accordance with ASTM D 3385

Test Date 2/14/2018

LGCI Representative: Andrew Jefferson

Weather Conditions: Sunny, 40 degrees

Test Depth: 34 inches

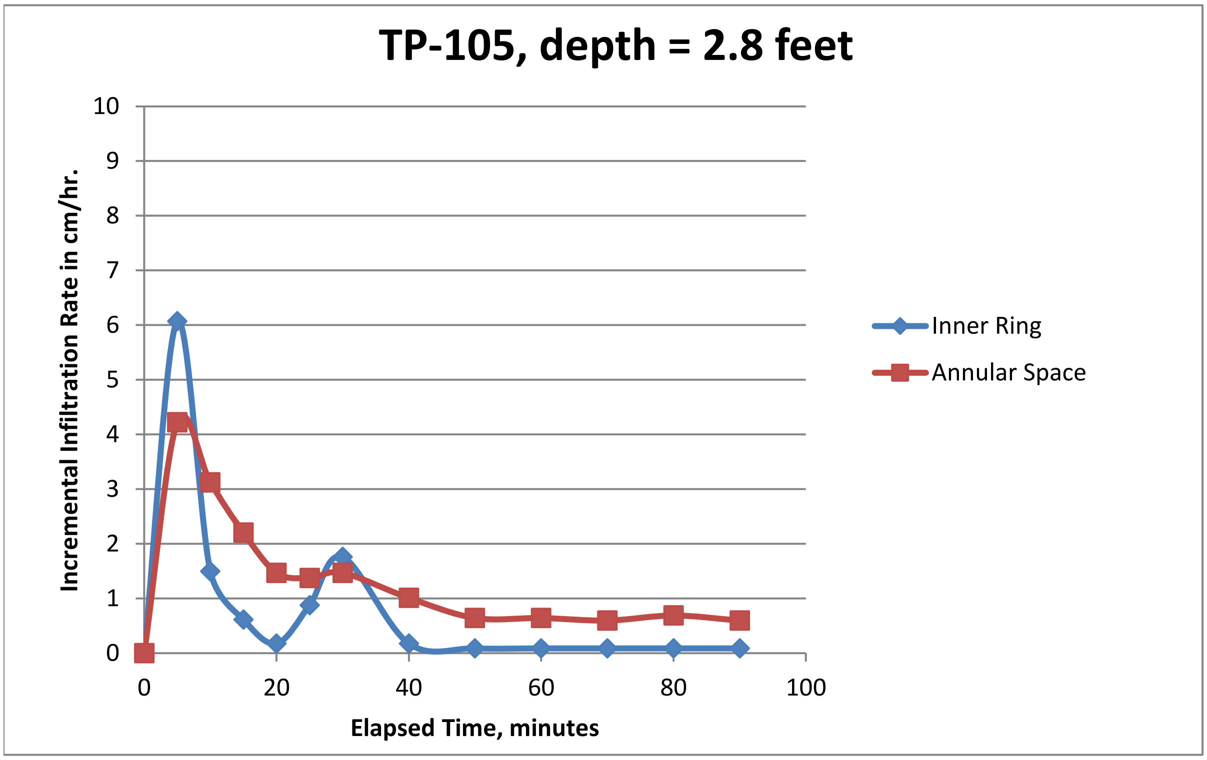
Groundwater Depth: NA

Soil Stratum: Silty SAND with Gravel (SM), fine, ~20% fines, 20-25% fine to coarse gravel, 5-10% cobbles, trace roots, light brown, moist (fill)

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	5
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr)	(div)	(cc)	(cm/hr)
0	0	57	0	0	57.0	0	0
5	5	50.1	369	6.1	52.4	771	4.2
10	5	48.4	91	1.5	49.0	570	3.1
15	5	47.7	37	0.6	46.6	402	2.2
20	5	47.5	11	0.2	45.0	268	1.5
25	5	46.5	54	0.9	43.5	251	1.4
30	5	44.5	107	1.8	41.9	268	1.5
40	10	44.1	21	0.2	39.7	369	1.0
50	10	43.9	11	0.1	38.3	235	0.6
60	10	43.7	11	0.1	36.9	235	0.6
70	10	43.5	11	0.1	35.6	218	0.6
80	10	43.3	11	0.1	34.1	251	0.7
90	10	43.1	11	0.1	32.8	218	0.6

Notes:
1. Began saturation at 1:30 PM and began test at 1:45 PM.


TP-105, depth = 2.8 feet
Incremental Infiltration Rate in cm/hr.
0
1
2
3
4
5
6
7
8
9
10
Elapsed Time, minutes
0
20
40
60
80
100
Inner Ring
Annular Space

Double Ring Infiltrometer Test

Project:

Name:	Proposed Worcester South High School
Location:	Worcester, MA
LGCI Project Number:	1644

Test Location: TP-115-IT

Test Procedure: General accordance with ASTM D 3385

Test Date 2/22/2018

LGCI Representative: Andrew Jefferson

Weather Conditions: Cloudy / 30

Test Depth: 3 feet

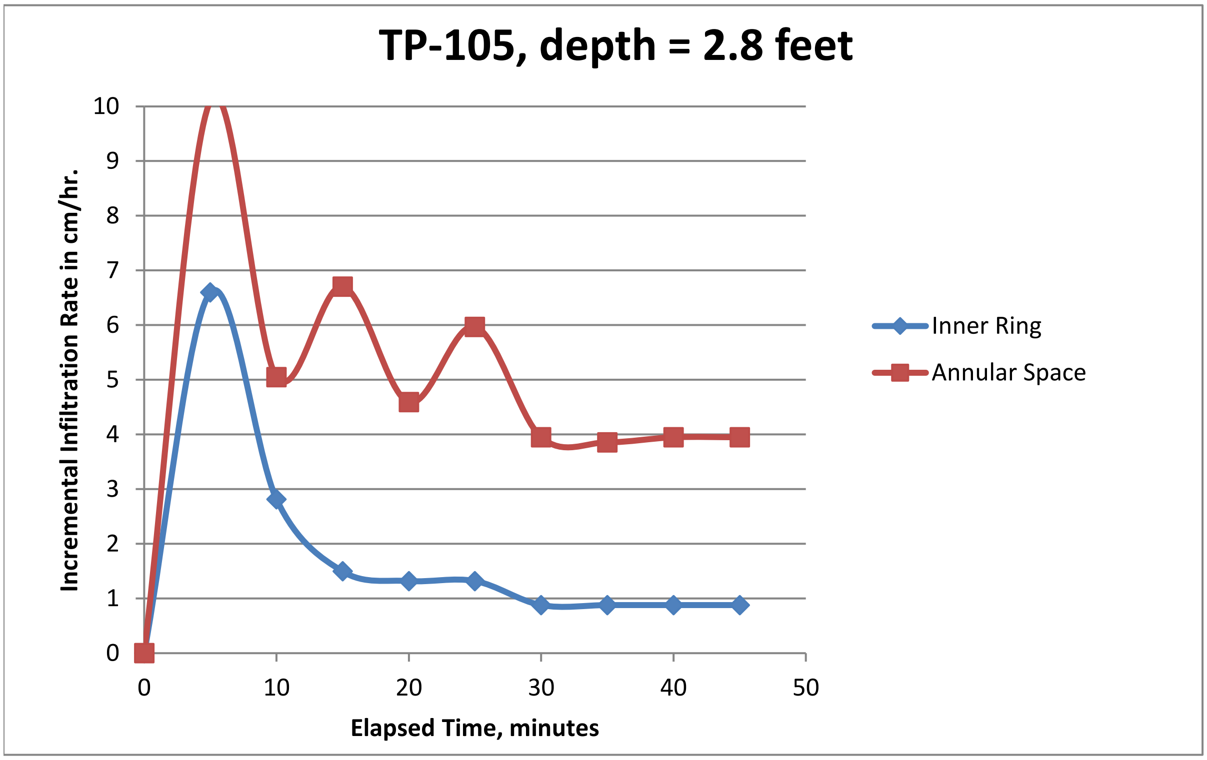
Groundwater Depth: NA

Soil Stratum: Silty SAND with Gravel (SM), fine, ~15% fines, 15-20% fine gravel, 0-5% cobble light brown, moist (natural)

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	1	1
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time (min)	Time Increment (min)	Inner Ring			Annular Space		
		Reading (div)	Volume (cc)	Infiltration Rate (cm/hr)	Reading (div)	Volume (cc)	Infiltration Rate (cm/hr)
0	0	56	0	0	56.5	0	0
5	5	48.5	401	6.6	45.5	1843	10.1
10	5	45.3	171	2.8	40.0	921	5.1
15	5	43.6	91	1.5	32.7	1223	6.7
20	5	42.1	80	1.3	27.7	838	4.6
25	5	40.6	80	1.3	21.2	1089	6.0
30	5	39.6	54	0.9	16.9	720	3.9
35	5	38.6	54	0.9	12.7	704	3.9
40	5	37.6	54	0.9	8.4	720	3.9
45	5	36.6	54	0.9	4.1	720	3.9

Notes:



TP-105, depth = 2.8 feet
Incremental Infiltration Rate in cm/hr.
10
9
8
7
6
5
4
3
2
1
0
0
10
20
30
40
50
Elapsed Time, minutes
Inner Ring
Annular Space

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project:

Name:	Proposed Worcester South High School
Location:	Worcester, MA
LGCI Project Number:	1644

Test Location: TP-118-IT

Test Procedure: General accordance with ASTM D 3385

Test Date 2/22/2018

LGCI Representative: Andrew Jefferson

Weather Conditions: Cloudy / 30

Test Depth: 3 feet

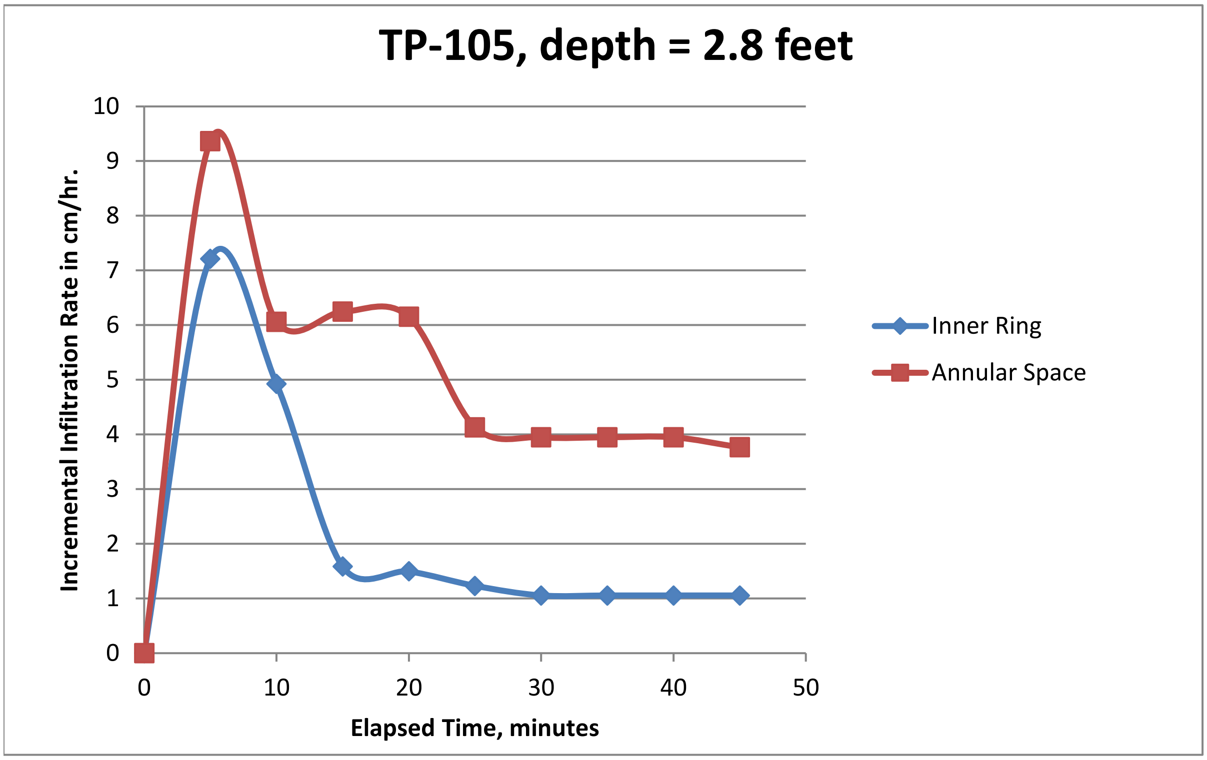
Groundwater Depth: NA

Soil Stratum: Silty SAND with Gravel (SM), fine, trace medium, trace coarse, 15-20% fines, 20-25% fine angular (fill)gravel, light brown, moist

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	1	1
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
(min)	(min)	Reading (div)	Volume (cc)	Infiltration Rate (cm/hr)	Reading (div)	Volume (cc)	Infiltration Rate (cm/hr)
0	0	55.5	0	0	56.5	0	0
5	5	47.3	439	7.2	46.3	1709	9.4
10	5	41.7	300	4.9	39.7	1106	6.1
15	5	39.9	96	1.6	32.9	1139	6.2
20	5	38.2	91	1.5	26.2	1122	6.2
25	5	36.8	75	1.2	21.7	754	4.1
30	5	35.6	64	1.1	17.4	720	3.9
35	5	34.4	64	1.1	13.1	720	3.9
40	5	33.2	64	1.1	8.8	720	3.9
45	5	32	64	1.1	4.7	687	3.8

Notes:


TP-105, depth = 2.8 feet
Incremental Infiltration Rate in cm/hr.
Elapsed Time, minutes
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
Inner Ring
Annular Space

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project:	Name:	Proposed Worcester South High School
	Location:	Worcester, MA
	LGCI Project Number:	1644

Test Location: TP-121-IT

Test Procedure: General accordance with ASTM D 3385

Test Date 2/26/2018

LGCI Representative: Andrew Jefferson

Weather Conditions: Sunny / 40

Test Depth: 4 feet

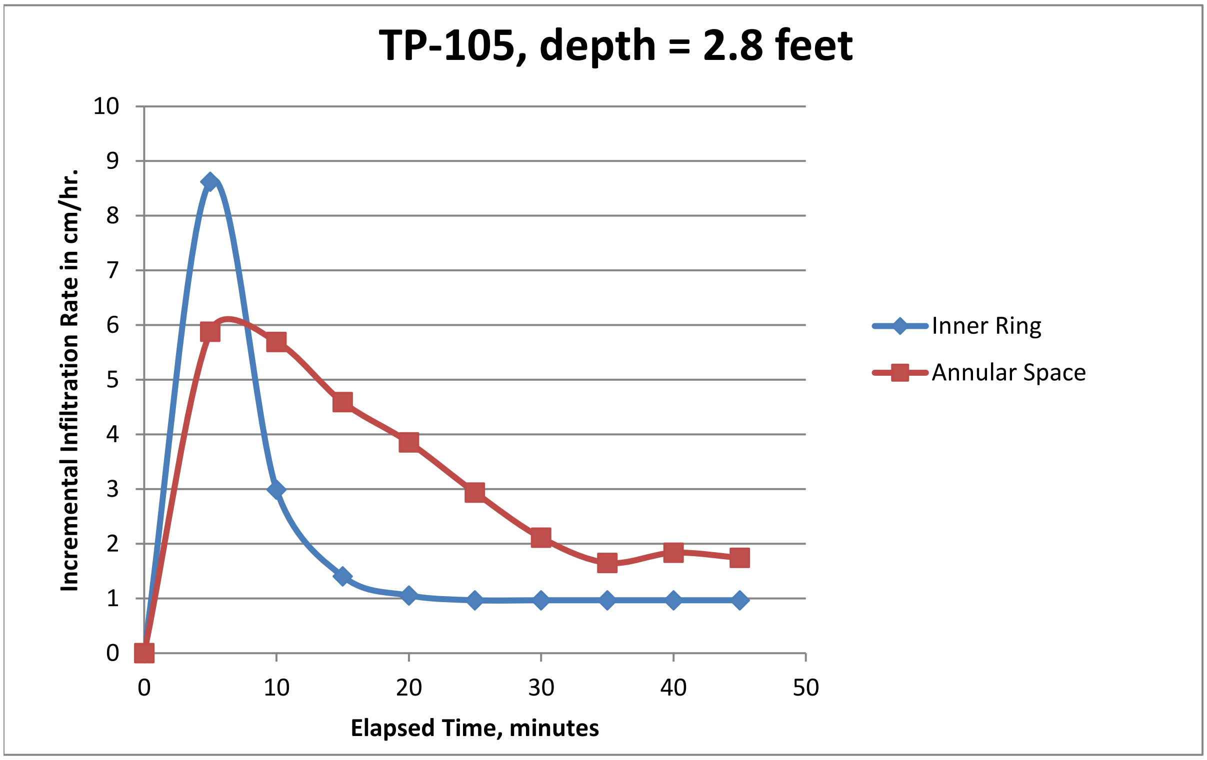
Groundwater Depth: NA

Soil Stratum: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 30-35% fine to coarse gravel, ~5% cobbles/boulders, light brown, moist (natural)

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	2	2
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
(min)	(min)	Reading (div)	Volume (cc)	Infiltration Rate (cm/hr)	Reading (div)	Volume (cc)	Infiltration Rate (cm/hr)
0	0	57	0	0	57.0	0	0
5	5	47.2	524	8.6	50.6	1072	5.9
10	5	43.8	182	3.0	44.4	1039	5.7
15	5	42.2	86	1.4	39.4	838	4.6
20	5	41	64	1.1	35.2	704	3.9
25	5	39.9	59	1.0	32.0	536	2.9
30	5	38.8	59	1.0	29.7	385	2.1
35	5	37.7	59	1.0	27.9	302	1.7
40	5	36.6	59	1.0	25.9	335	1.8
45	5	35.5	59	1.0	24.0	318	1.7
50	5	34.4	59	1.0	21.9	352	1.9
55	5	33.3	59	1.0	19.9	335	1.8
60	5	32.2	59	1.0	18.0	318	1.7

Notes:

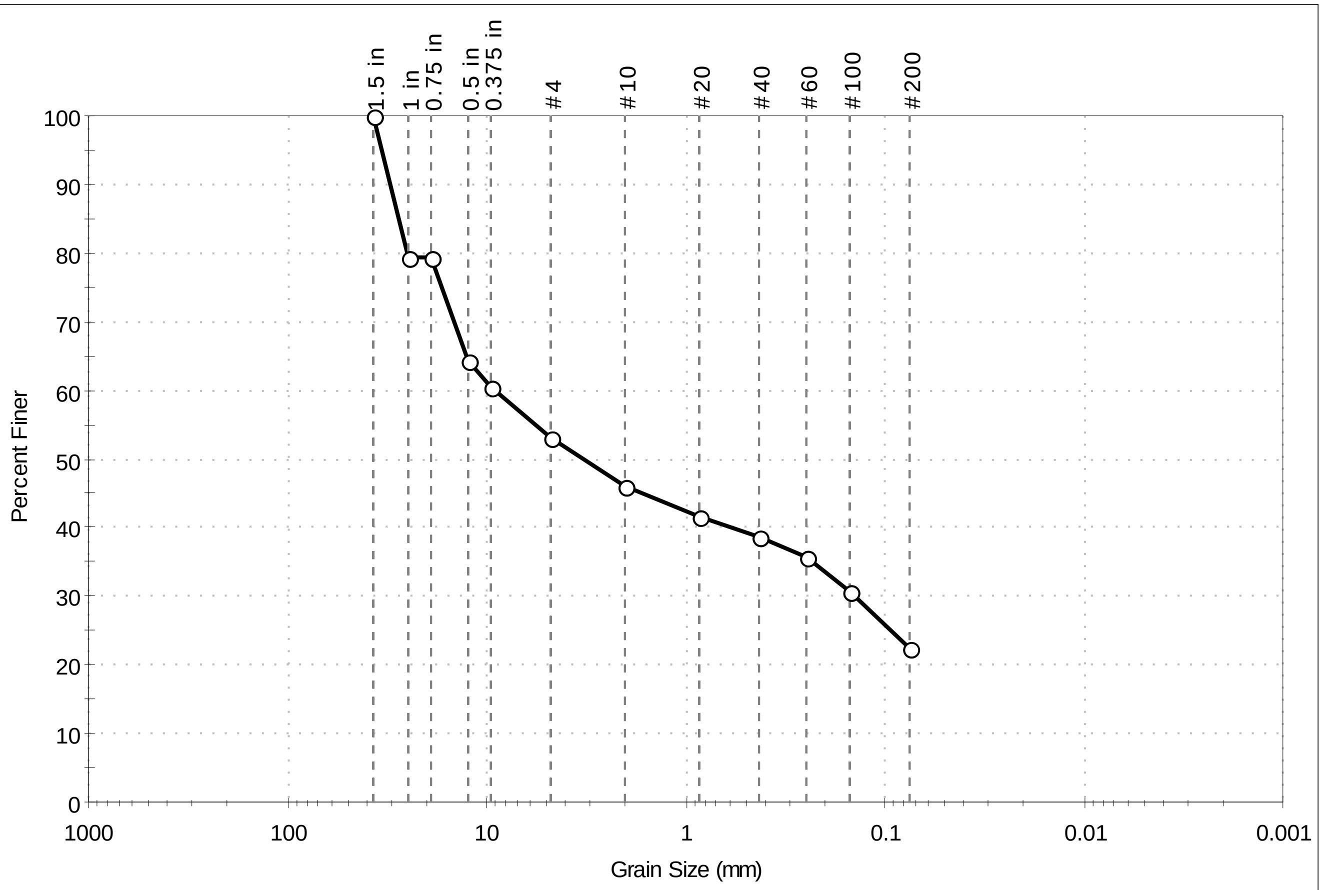

TP-105, depth = 2.8 feet
Incremental Infiltration Rate in cm/hr.
Elapsed Time, minutes
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
Inner Ring
Annular Space

APPENDIX E - Laboratory Test Results

Client:	Lahlaf Geotechnical Consulting				
Project:	Prop. Worcester South HS				
Location:	Winchester, MA			Project No:	GTX-306885
Boring ID:	B-5	Sample Type:	jar	Tested By:	jbr
Sample ID:	S2	Test Date:	08/24/17	Checked By:	emm
Depth :	2-4	Test Id:	421309		

Test Comment: ---
Visual Description: Moist, dark yellowish brown silty gravel with sand
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	47.0	30.6	22.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	79		
0.75 in	19.00	79		
0.5 in	12.50	64		
0.375 in	9.50	61		
#4	4.75	53		
#10	2.00	46		
#20	0.85	42		
#40	0.42	39		
#60	0.25	36		
#100	0.15	31		
#200	0.075	22		

Coefficients

D_{85} = 27.9111 mm	D_{30} = 0.1422 mm
D_{60} = 9.0575 mm	D_{15} = N/A
D_{50} = 3.2455 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

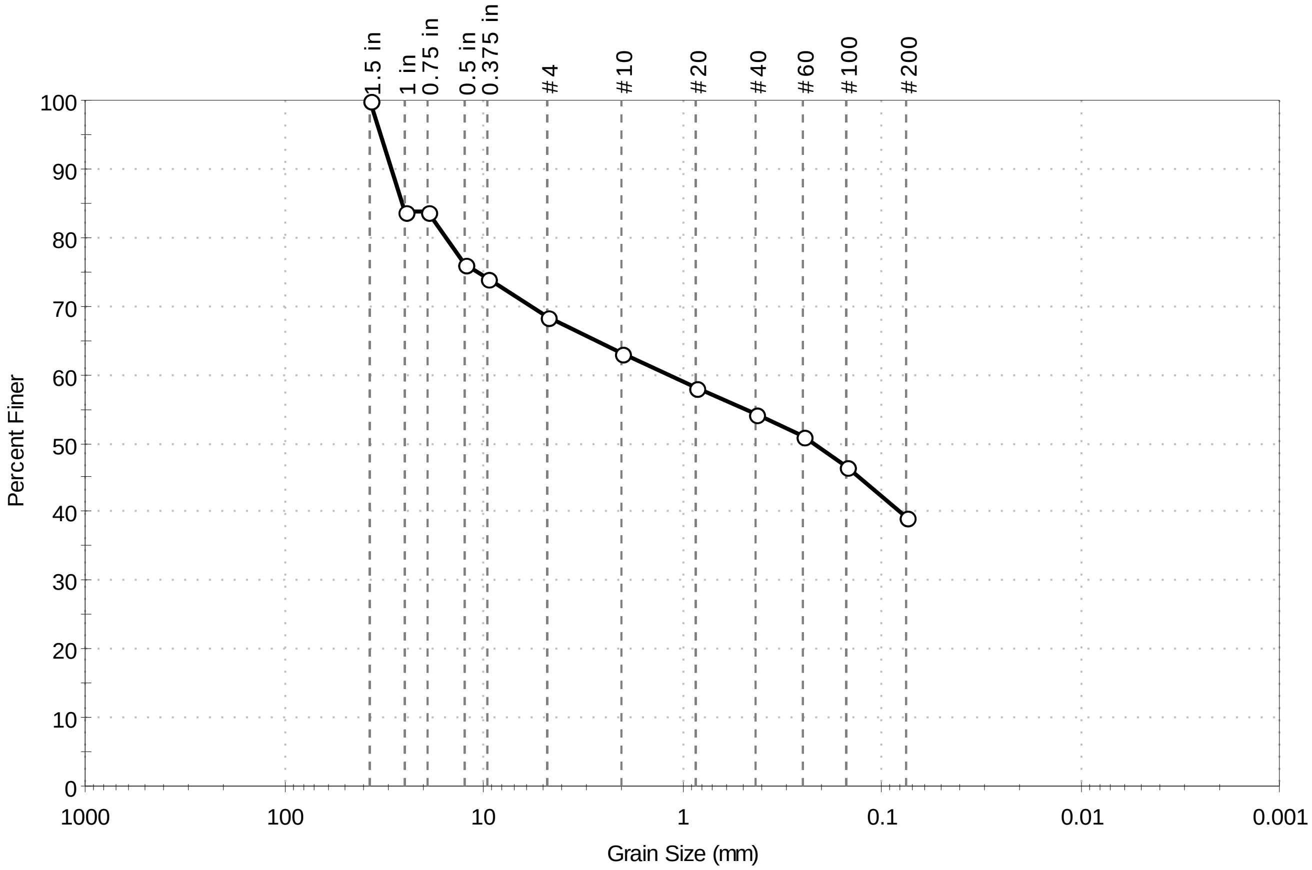
GeoTesting EXPRESS

Client: Lahlaf Geotechnical Consulting
Project: Prop. Worcester South HS
Location: Winchester, MA
Project No: GTX-306885

Boring ID: B-7
Sample Type: jar
Tested By: jbr
Sample ID: S2
Test Date: 08/24/17
Checked By: emm
Depth : 2-4
Test Id: 421310

Test Comment: ---
Visual Description: Moist, grayish brown silty gravel with sand
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	31.5	29.4	39.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	84		
0.75 in	19.00	84		
0.5 in	12.50	76		
0.375 in	9.50	74		
#4	4.75	68		
#10	2.00	63		
#20	0.85	58		
#40	0.42	54		
#60	0.25	51		
#100	0.15	47		
#200	0.075	39		

Coefficients

D_{85} = 25.8594 mm
D_{30} = N/A
D_{60} = 1.1725 mm
D_{15} = N/A
D_{50} = 0.2206 mm
D_{10} = N/A
C_u = N/A
C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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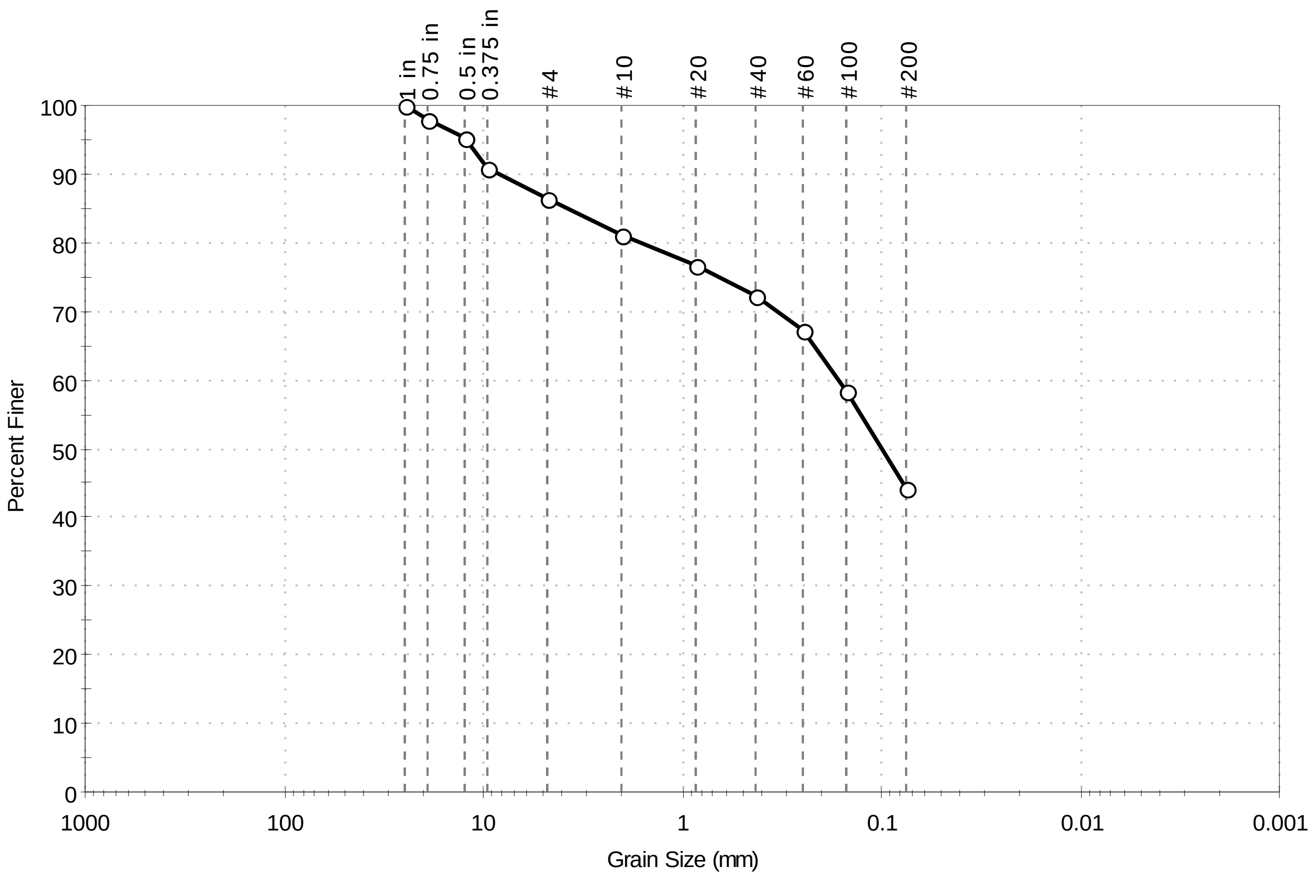
GeoTesting EXPRESS

Client:	Lahlaf Geotechnical Consulting				
Project:	Prop. Worcester South HS				
Location:	Winchester, MA			Project No:	GTX-306885
Boring ID:	B-8	Sample Type:	jar	Tested By:	jbr
Sample ID:	S2	Test Date:	08/24/17	Checked By:	emm
Depth :	2-4	Test Id:	421312		

Test Comment: ---
Visual Description: Moist, olive gray clayey sand
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	13.4	42.4	44.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	98		
0.5 in	12.50	95		
0.375 in	9.50	91		
#4	4.75	87		
#10	2.00	81		
#20	0.85	77		
#40	0.42	72		
#60	0.25	67		
#100	0.15	58		
#200	0.075	44		

Coefficients

D_{85} = 3.6908 mm	D_{30} = N/A
D_{60} = 0.1640 mm	D_{15} = N/A
D_{50} = 0.0994 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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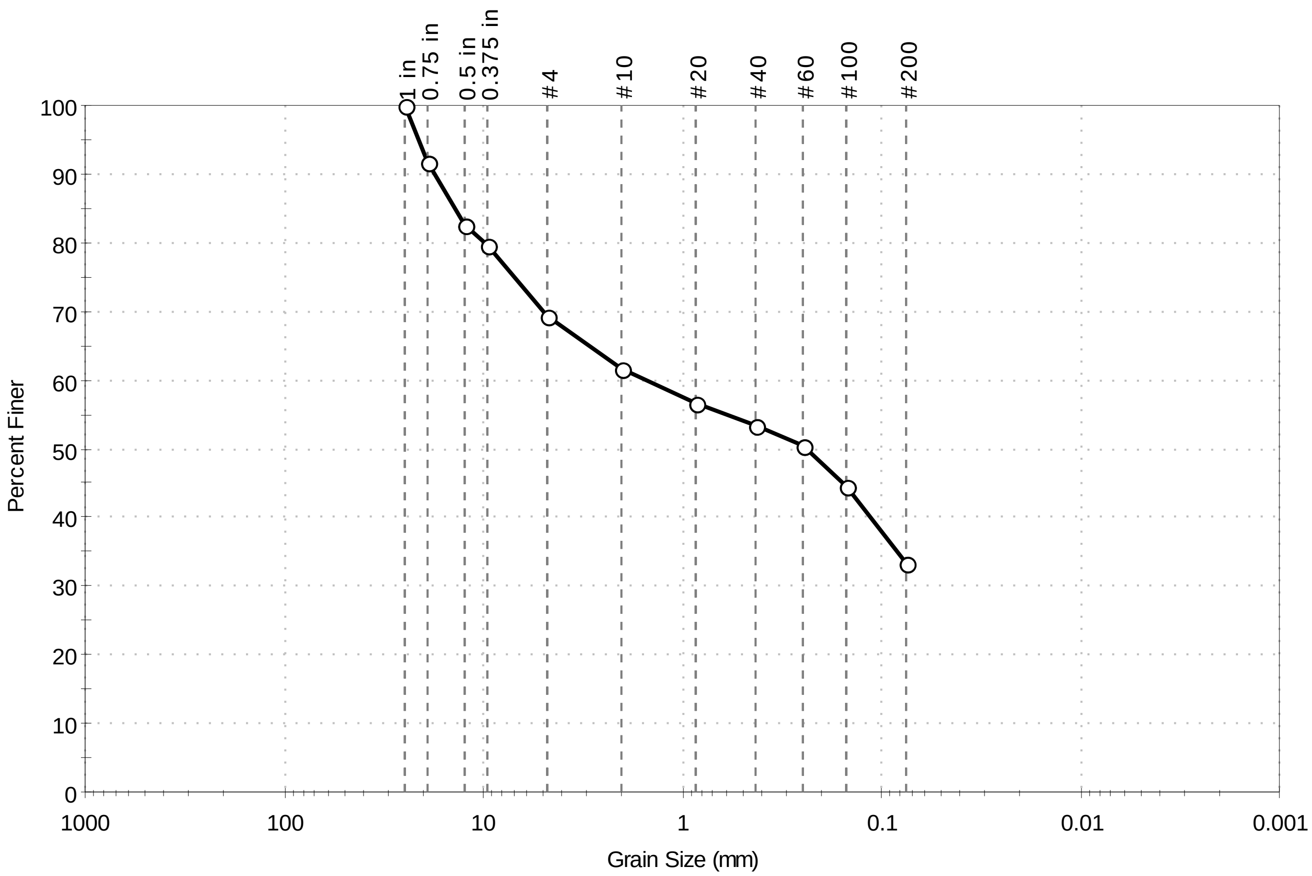
GeoTesting EXPRESS

Client:	Lahlaf Geotechnical Consulting				
Project:	Prop. Worcester South HS				
Location:	Winchester, MA			Project No:	GTX-306885
Boring ID:	B-8	Sample Type:	jar	Tested By:	jbr
Sample ID:	S3	Test Date:	08/24/17	Checked By:	emm
Depth :	4-6	Test Id:	421311		

Test Comment: ---
Visual Description: Moist, olive gray clayey sand with gravel
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	30.8	35.9	33.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	83		
0.375 in	9.50	80		
#4	4.75	69		
#10	2.00	62		
#20	0.85	57		
#40	0.42	54		
#60	0.25	50		
#100	0.15	45		
#200	0.075	33		

Coefficients

D_{85} = 13.9587 mm	D_{30} = N/A
D_{60} = 1.4758 mm	D_{15} = N/A
D_{50} = 0.2409 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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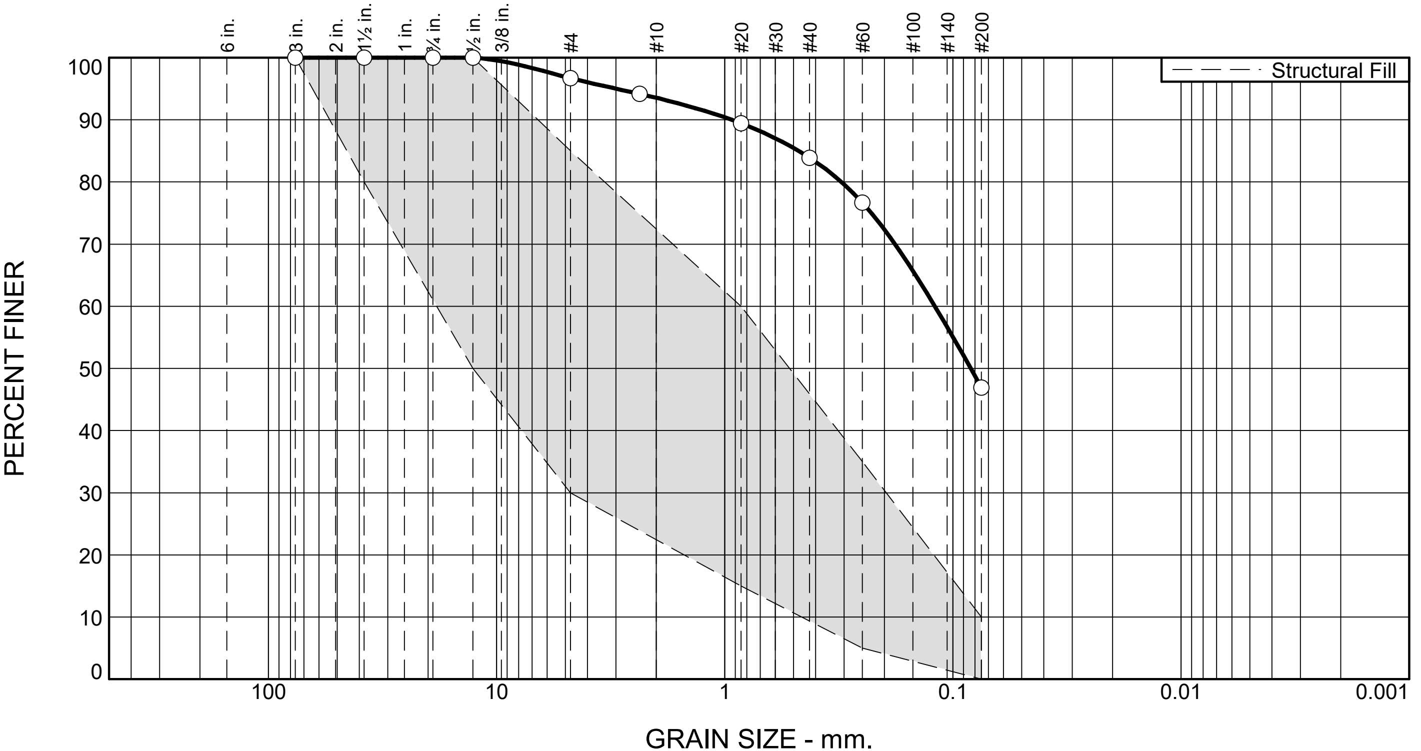
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	3.3	3.2	9.6	37.0	46.9

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	100.0		
0.5	100.0	50.0 - 100.0	
#4	96.7	30.0 - 85.0	X
#8	94.2		
#20	89.4	15.0 - 60.0	X
#40	83.9		
#60	76.7	5.0 - 35.0	X
#200	46.9	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, trace coarse, 45-50% fines, trace fine subangular gravel, brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	0.9357	D_{85}=	0.4753	D_{60}=	0.1201
D_{50}=	0.0836	D_{30}=		D_{15}=	
D_{10}=		C_u=		C_c=	

Remarks

Fill sample.

Date Received: 2/14/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

Source of Sample: Boring B-105 **Depth:** 4' - 6' **Date Sampled:** 2/14/2018

Sample Number: S3

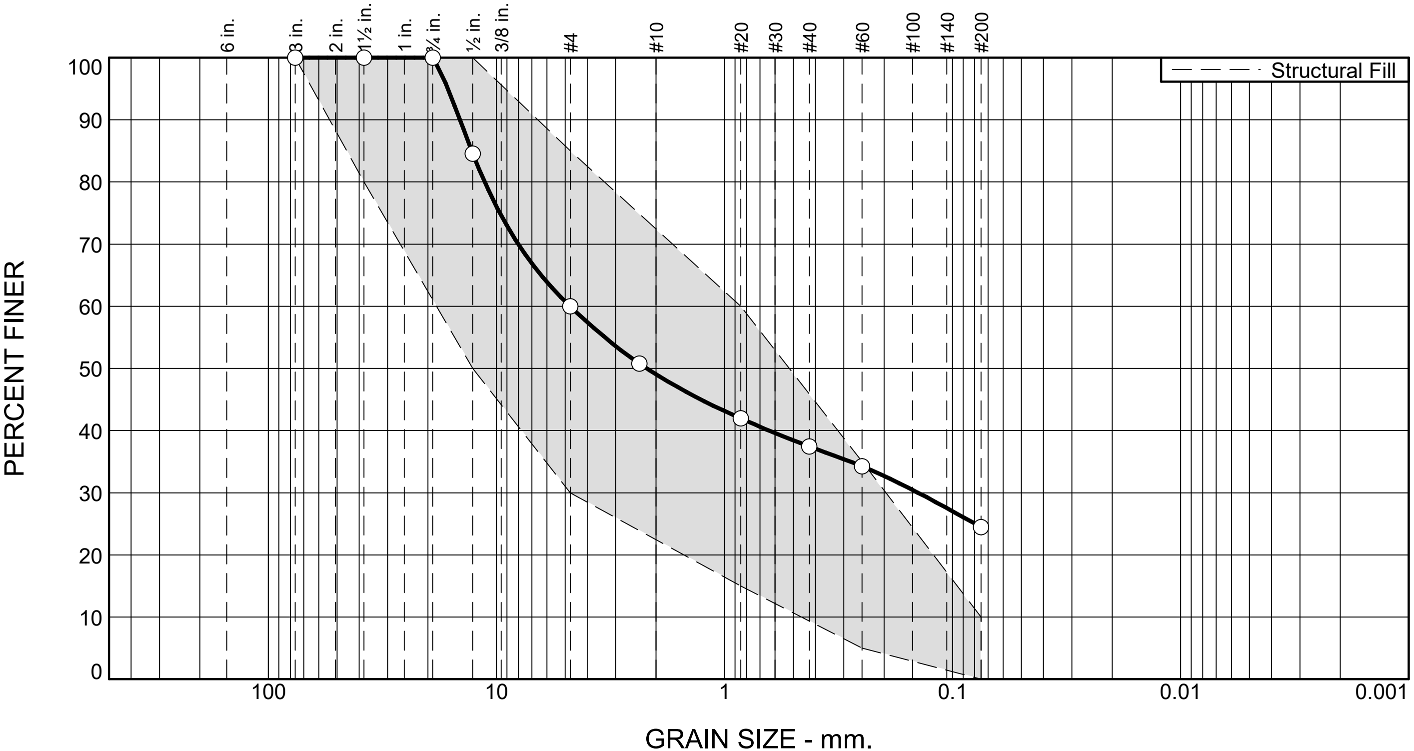
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.

Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	40.0	10.9	11.7	13.0	24.4

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	100.0		
0.5	84.5	50.0 - 100.0	
#4	60.0	30.0 - 85.0	
#8	50.8		
#20	42.0	15.0 - 60.0	
#40	37.4		
#60	34.3	5.0 - 35.0	
#200	24.4	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty GRAVEL with Sand (GM), fine, angular, 20-25% fines, 35-40% fine to coarse sand, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 14.4567	D_{85}= 12.8443	D_{60}= 4.7532
D_{50}= 2.1912	D_{30}= 0.1418	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Fill sample.

Date Received: 2/27/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

Source of Sample: Boring B-110 **Depth:** 2' - 4' **Date Sampled:** 2/26/2018

Sample Number: S2

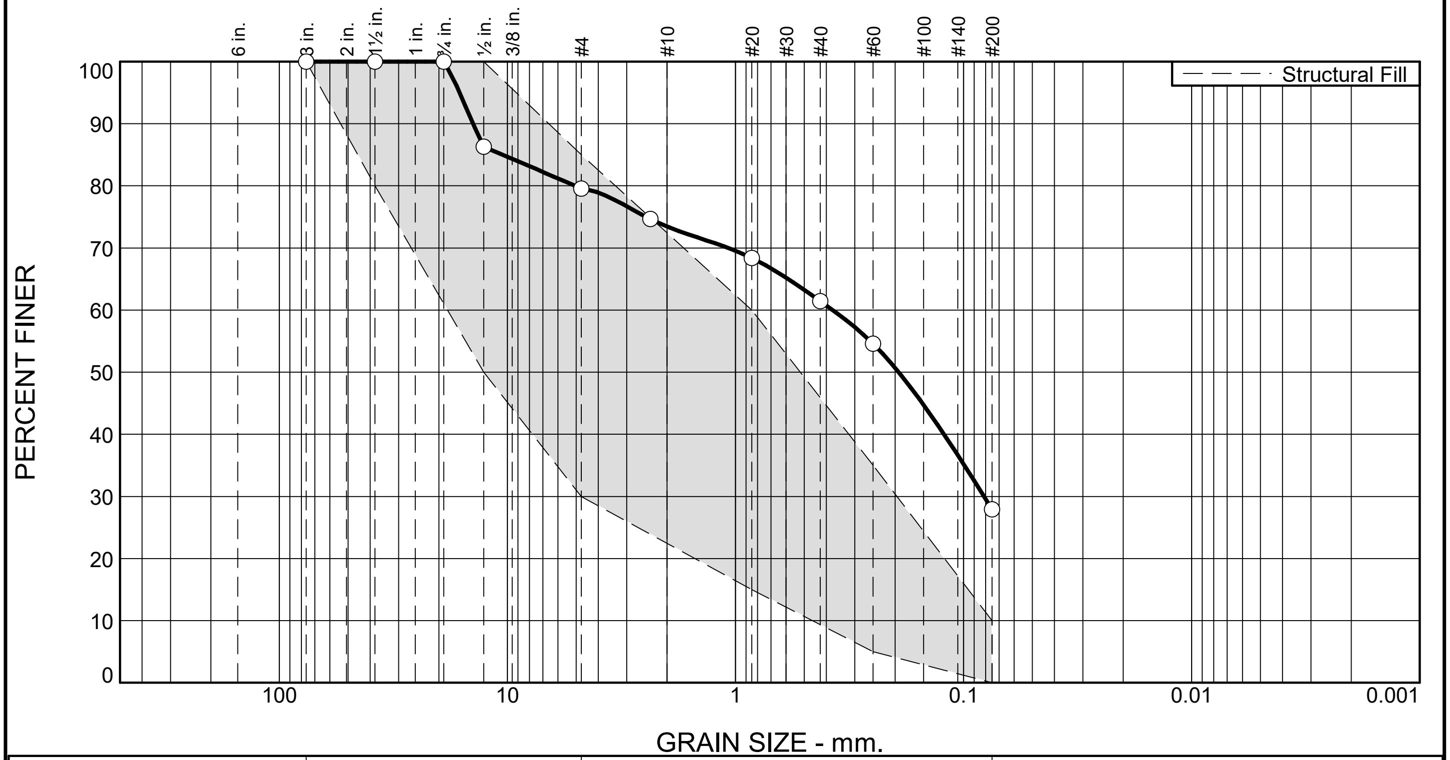
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.

Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	20.4	6.1	12.1	33.5	27.9

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	100.0		
0.5	86.3	50.0 - 100.0	
#4	79.6	30.0 - 85.0	
#8	74.6		
#20	68.4	15.0 - 60.0	X
#40	61.4		
#60	54.6	5.0 - 35.0	X
#200	27.9	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 20-25% fine subrounded gravel, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 14.1681	D_{85}= 10.4931	D_{60}= 0.3757
D_{50}= 0.1928	D_{30}= 0.0815	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Natural sand sample.

Date Received: 2/27/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

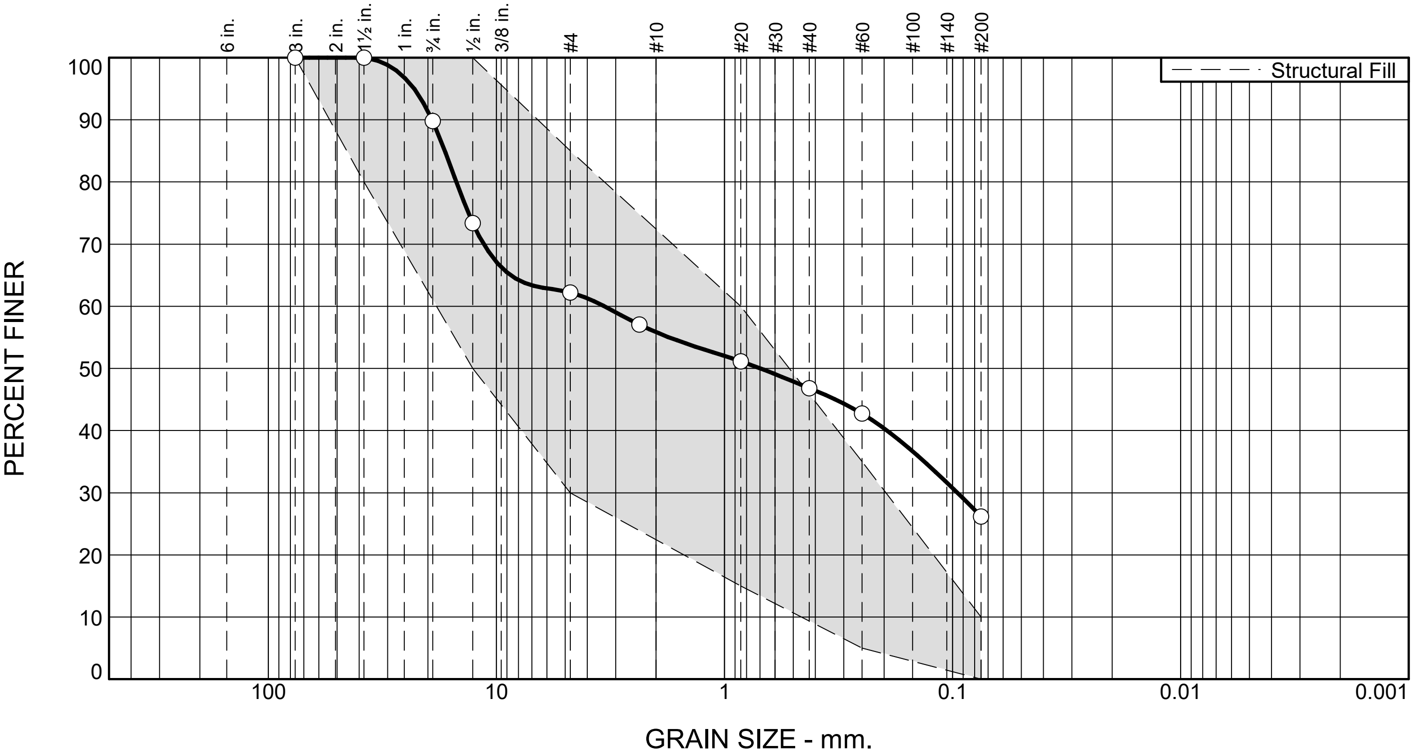
Source of Sample: Boring B-110 **Depth:** 6' - 8' **Date Sampled:** 2/26/2018
Sample Number: S4

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	10.2	27.6	6.4	9.0	20.6	26.2

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	89.8		
0.5	73.4	50.0 - 100.0	
#4	62.2	30.0 - 85.0	
#8	57.0		
#20	51.1	15.0 - 60.0	
#40	46.8		
#60	42.7	5.0 - 35.0	X
#200	26.2	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty GRAVEL with Sand (GM), fine to coarse, subrounded, 25-30% fines, 35-40% fine to coarse sand, light brown, wet

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 19.1665	D_{85}= 16.8457	D_{60}= 3.3642
D_{50}= 0.6982	D_{30}= 0.0956	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Natural gravel sample.

Date Received: 2/27/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

Source of Sample: Boring B-118B-OW **Depth:** 6' - 8' **Date Sampled:** 2/27/2018

Sample Number: S4

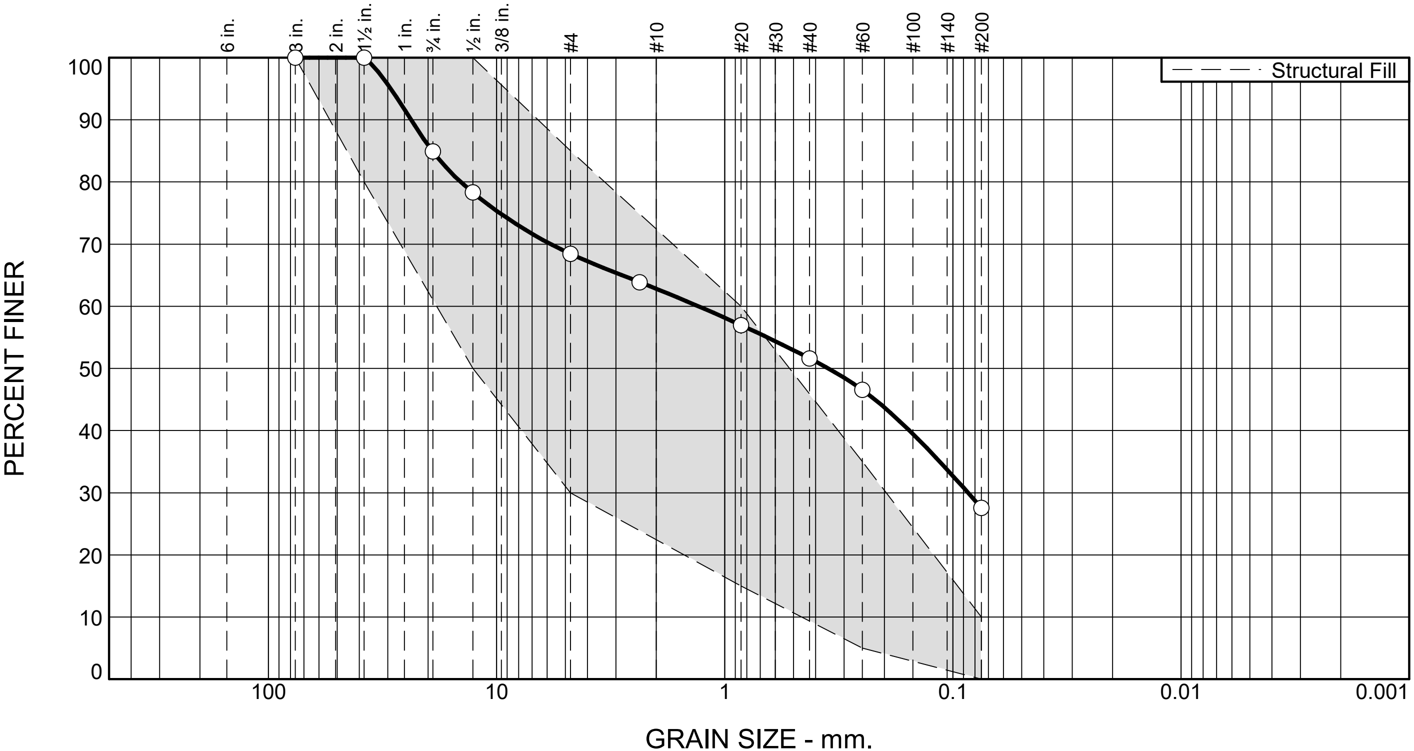
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.

Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	15.1	16.5	5.6	11.2	24.0	27.6

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	84.9		
0.5	78.3	50.0 - 100.0	
#4	68.4	30.0 - 85.0	
#8	63.9		
#20	57.0	15.0 - 60.0	
#40	51.6		
#60	46.5	5.0 - 35.0	X
#200	27.6	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 30-35% fine to coarse angular gravel, trace organic fines, brown, wet

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 23.7008	D_{85}= 19.1451	D_{60}= 1.3060
D_{50}= 0.3523	D_{30}= 0.0860	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Fill sample.

Date Received: 3/1/2018 **Date Tested:** 3/22/2018

Tested By: TS

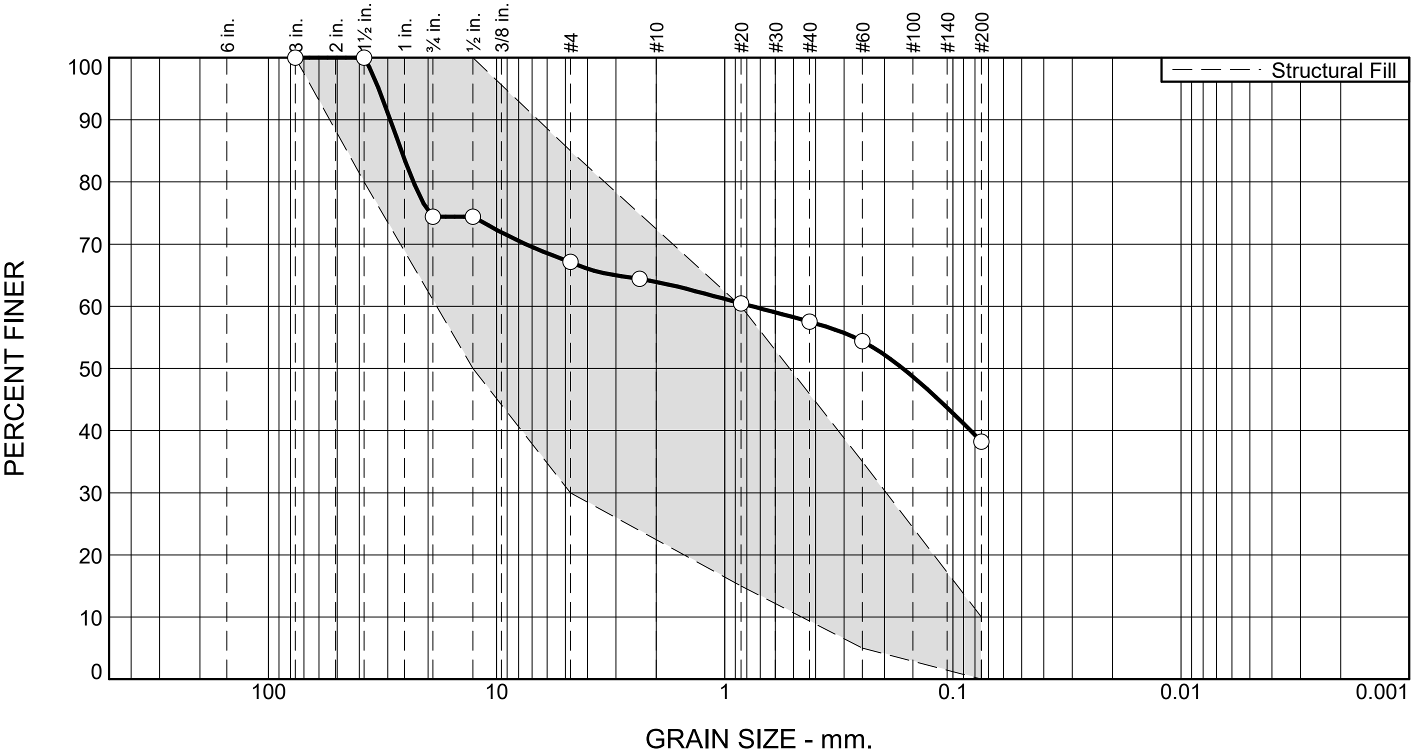
Checked By: MC

Source of Sample: Boring B-119A **Depth:** 6' - 8' **Date Sampled:** 2/28/2018
Sample Number: S4

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts
Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	25.6	7.3	3.2	6.4	19.3	38.2

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	74.4		
0.5	74.4	50.0 - 100.0	
#4	67.1	30.0 - 85.0	
#8	64.4		
#20	60.5	15.0 - 60.0	X
#40	57.5		
#60	54.4	5.0 - 35.0	X
#200	38.2	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty GRAVEL with Sand (GM), fine to coarse, angular, 35-40% fines, 25-30% fine to medium, trace coarse sand, light brown, wet

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 29.2485 D_{85}= 26.1409 D_{60}= 0.7626
D_{50}= 0.1658 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural gravel sample.

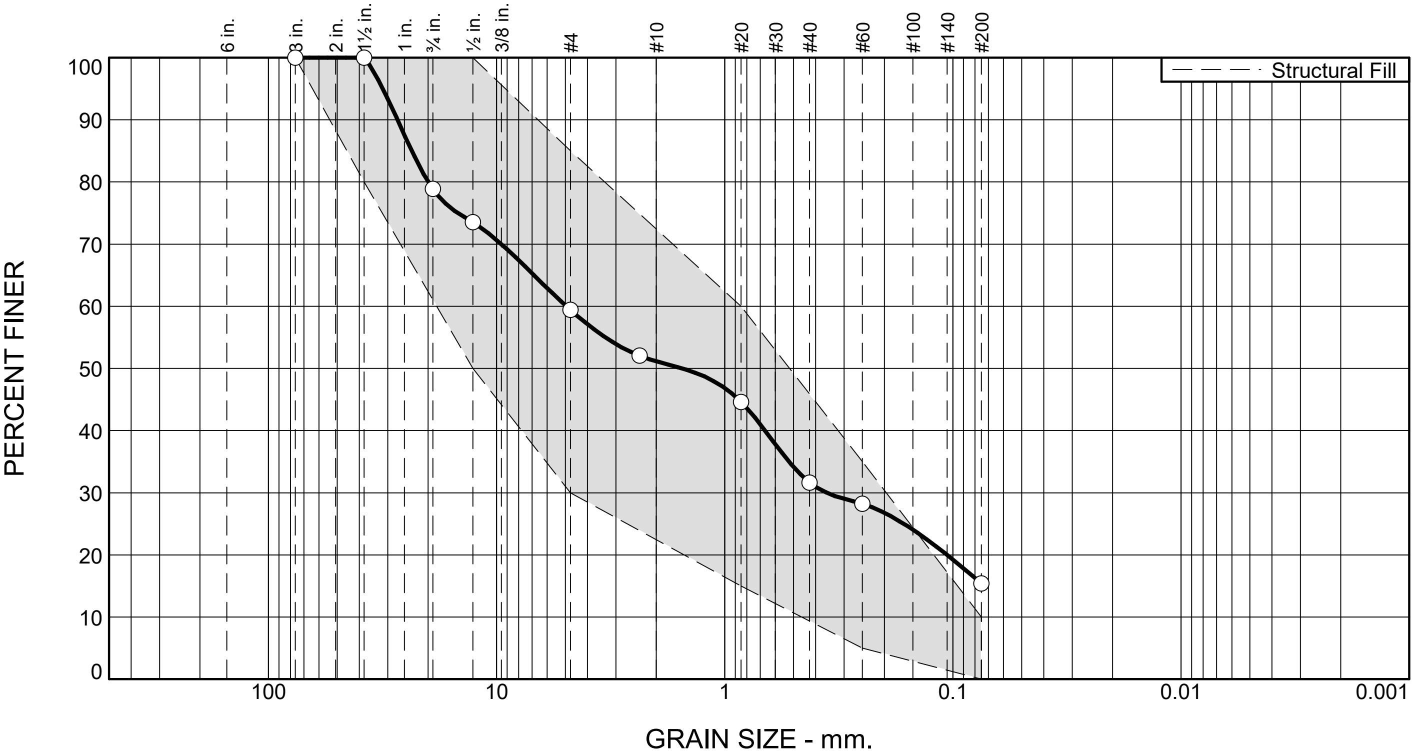
Date Received: 3/1/2018 **Date Tested:** 3/22/2018
Tested By: TS
Checked By: MC

Source of Sample: Boring B-119A **Depth:** 16' - 18' **Date Sampled:** 2/28/2018
Sample Number: S7

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts
Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	21.1	19.5	8.3	19.5	16.2	15.4

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	78.9		
0.5	73.5	50.0 - 100.0	
#4	59.4	30.0 - 85.0	
#8	52.0		
#20	44.6	15.0 - 60.0	
#40	31.6		
#60	28.2	5.0 - 35.0	
#200	15.4	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 40-45% fine to coarse angular gravel, brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 27.1926 D_{85}= 23.5514 D_{60}= 4.9533
D_{50}= 1.5439 D_{30}= 0.3583 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill sample.

Date Received: 3/1/2018 **Date Tested:** 3/22/2018

Tested By: TS

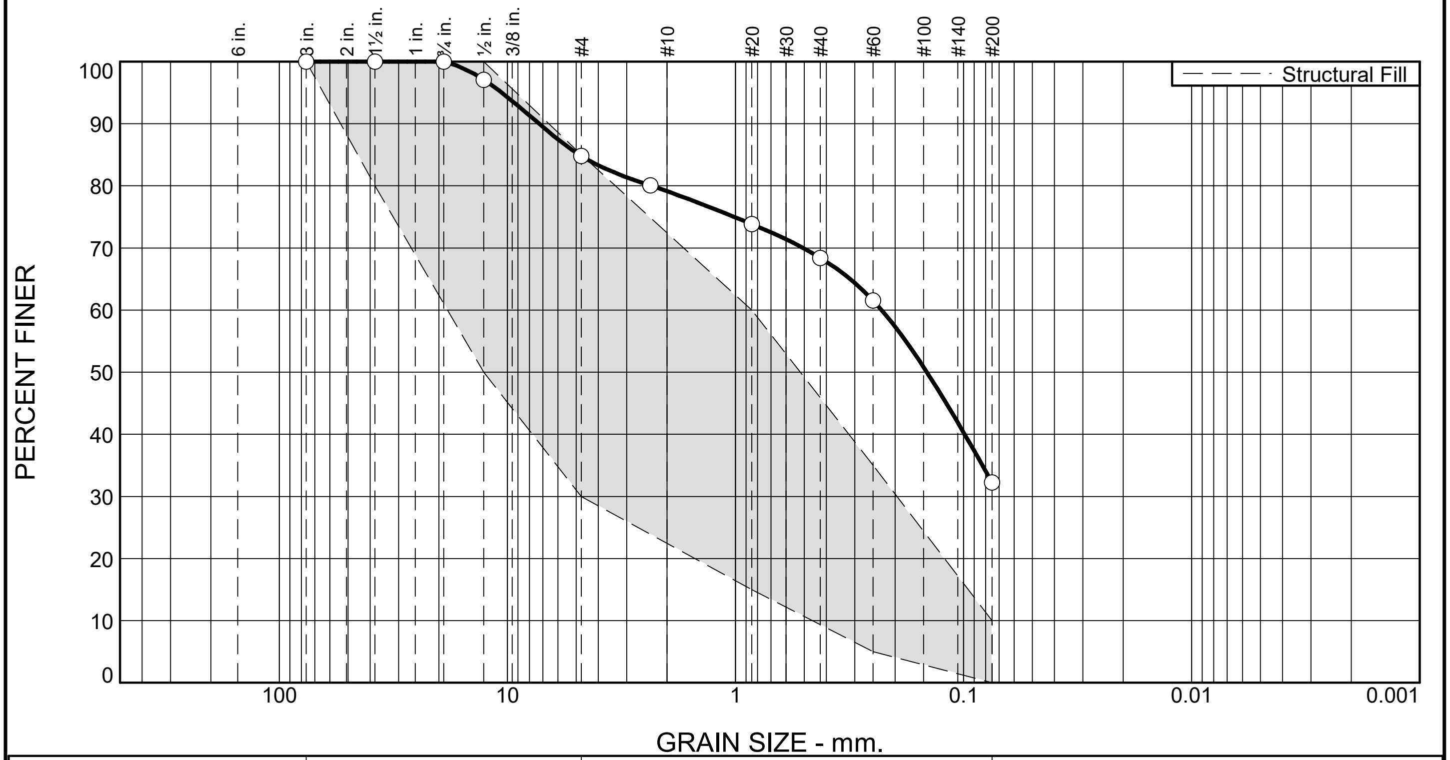
Checked By: MC

Source of Sample: Boring B-124 **Depth:** 4' - 6' **Date Sampled:** 3/1/2018
Sample Number: S3

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts
Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	15.2	5.7	10.7	36.1	32.3

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	100.0		
0.5	97.1	50.0 - 100.0	
#4	84.8	30.0 - 85.0	
#8	80.1		
#20	73.8	15.0 - 60.0	X
#40	68.4		
#60	61.6	5.0 - 35.0	X
#200	32.3	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 15-20% fine subangular gravel, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 7.2696	D_{85}= 4.8367	D_{60}= 0.2290
D_{50}= 0.1449	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Fill sample.

Date Received: 2/14/2018 **Date Tested:** 3/20/2018

Tested By: TS

Checked By: MC

Source of Sample: Test Pit TP-101-IT **Depth:** 1' - 7' **Date Sampled:** 2/13/2018

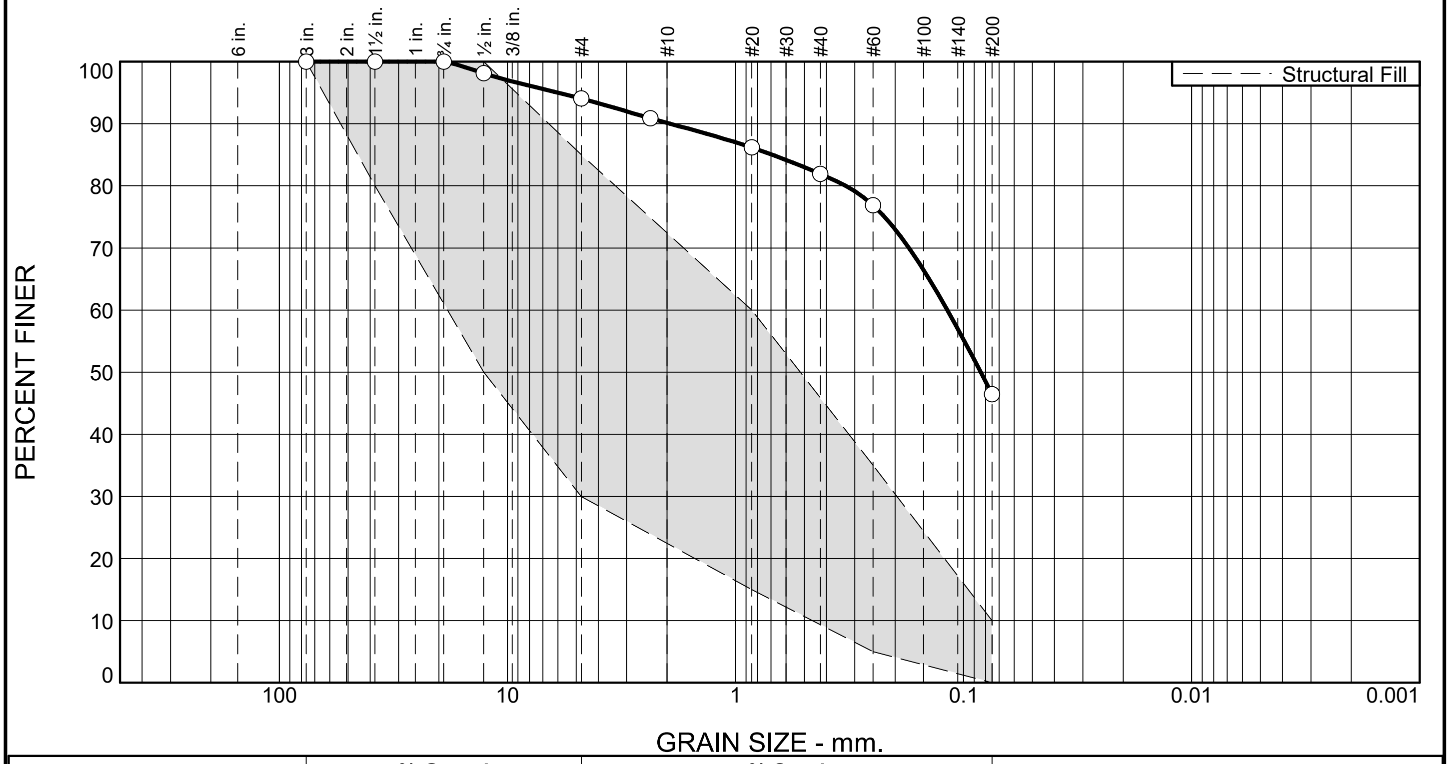
Sample Number: S2

Client: Lamoureux Pagano & Associates, Inc.

Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	6.0	3.9	8.2	35.5	46.4

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	100.0		
0.5	98.1	50.0 - 100.0	
#4	94.0	30.0 - 85.0	X
#8	90.9		
#20	86.2	15.0 - 60.0	X
#40	81.9		
#60	76.9	5.0 - 35.0	X
#200	46.4	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, trace coarse, 45-50% fines, 5-10% fine subangular gravel, trace roots, trace organic fines, brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 1.9390 D_{85}= 0.6889 D_{60}= 0.1180
D_{50}= 0.0842 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill sample.

Date Received: 2/16/2018 **Date Tested:** 3/20/2018

Tested By: TS

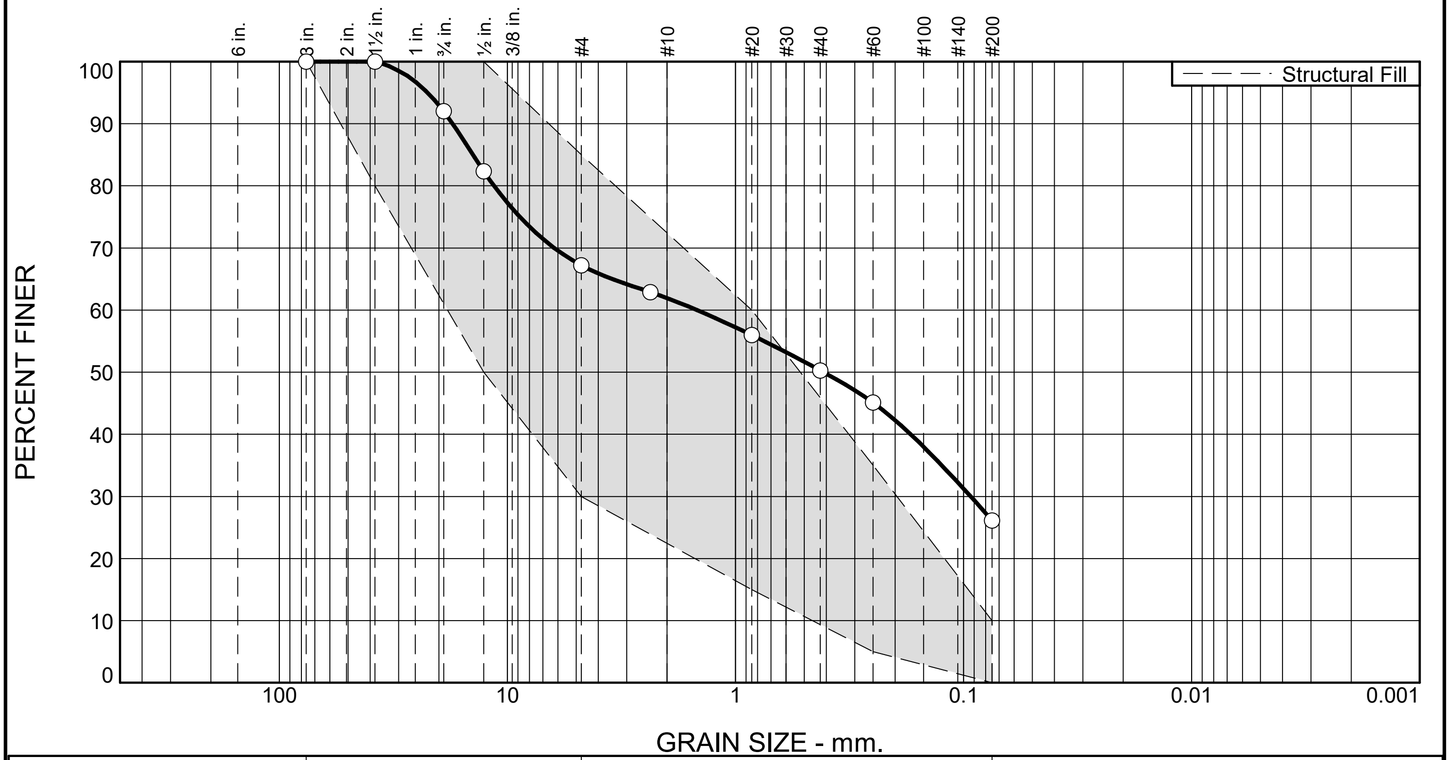
Checked By: MC

Source of Sample: Test Pit TP-102 **Depth:** 2' - 6' **Date Sampled:** 2/12/2018
Sample Number: S2

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts
Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	8.0	24.8	5.3	11.6	24.2	26.1

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	92.0		
0.5	82.3	50.0 - 100.0	
#4	67.2	30.0 - 85.0	
#8	62.9		
#20	56.0	15.0 - 60.0	
#40	50.3		
#60	45.1	5.0 - 35.0	X
#200	26.1	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 30-35% fine to coarse subangular gravel, trace organic fines, brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 17.3907	D_{85}= 14.1714	D_{60}= 1.4775
D_{50}= 0.4115	D_{30}= 0.0933	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Fill sample.

Date Received: 2/16/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

Source of Sample: Test Pit TP-111 **Depth:** 0.8' - 5' **Date Sampled:** 2/12/2018

Sample Number: S2

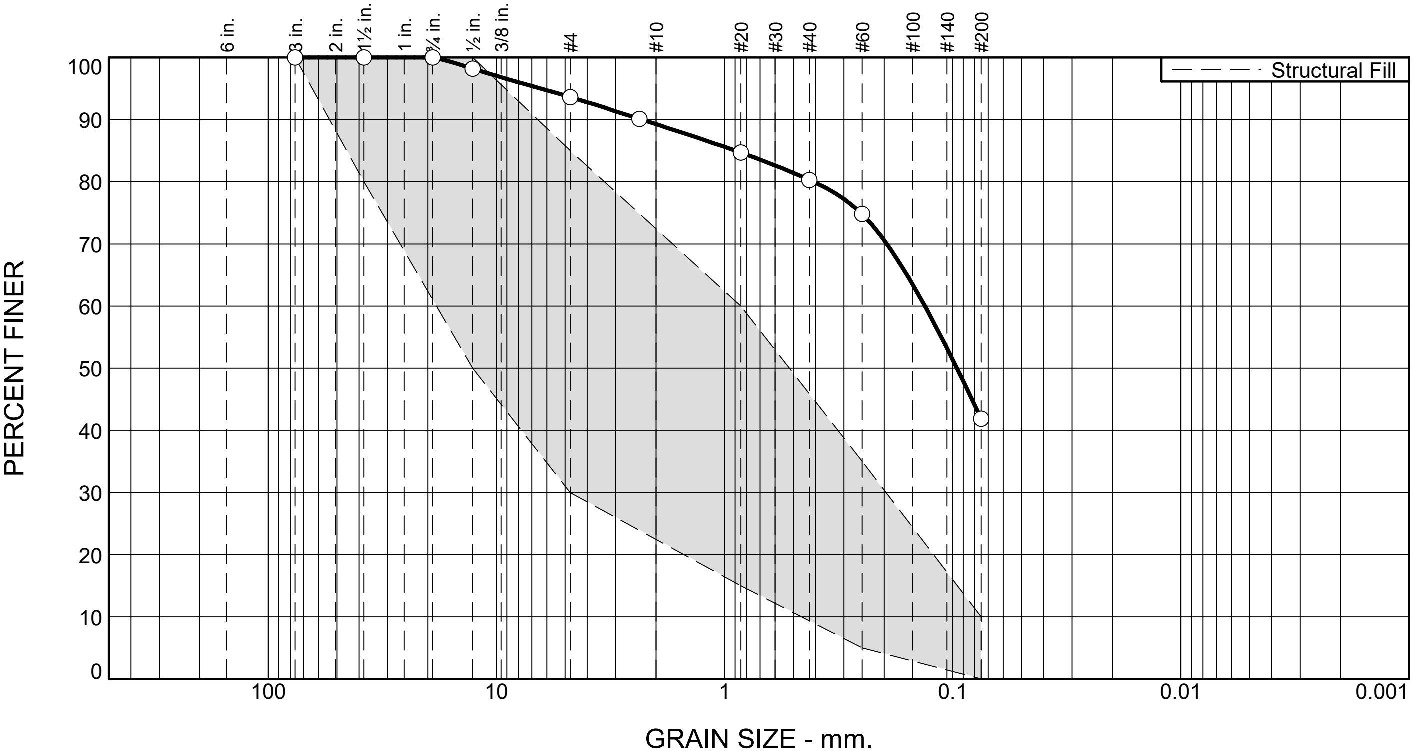
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.

Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	6.4	4.3	9.0	38.4	41.9

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	100.0		
0.5	98.2	50.0 - 100.0	
#4	93.6	30.0 - 85.0	X
#8	90.1		
#20	84.7	15.0 - 60.0	X
#40	80.3		
#60	74.8	5.0 - 35.0	X
#200	41.9	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, trace coarse, 40-45% fines, 5-10% fine angular gravel, trace roots, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 2.3140	D_{85}= 0.8979	D_{60}= 0.1325
D_{50}= 0.0960	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Fill sample.

Date Received: 2/23/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

Source of Sample: Test Pit TP-120 **Depth:** 2.5' - 5' **Date Sampled:** 2/23/2018

Sample Number: S2

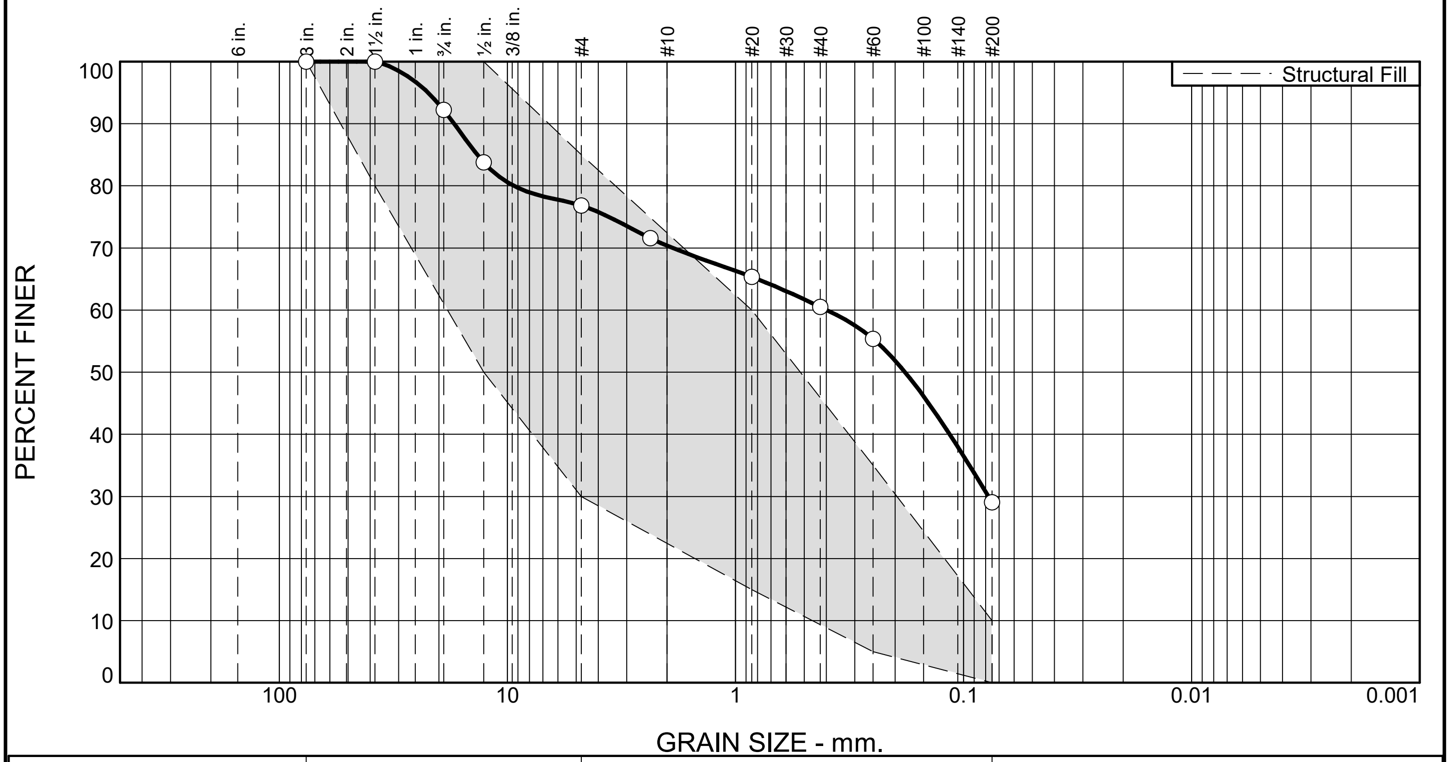
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.

Project: Proposed Worcester South High School, Worcester, Massachusetts

Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	7.8	15.4	6.4	9.9	31.5	29.0

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	92.2		
0.5	83.8	50.0 - 100.0	
#4	76.8	30.0 - 85.0	
#8	71.6		
#20	65.3	15.0 - 60.0	X
#40	60.5		
#60	55.4	5.0 - 35.0	X
#200	29.0	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 20-25% fine to coarse subrounded gravel, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 17.1254 D_{85}= 13.5683 D_{60}= 0.3981
D_{50}= 0.1807 D_{30}= 0.0778 D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural sand sample.

Date Received: 2/23/2018 **Date Tested:** 3/21/2018

Tested By: TS

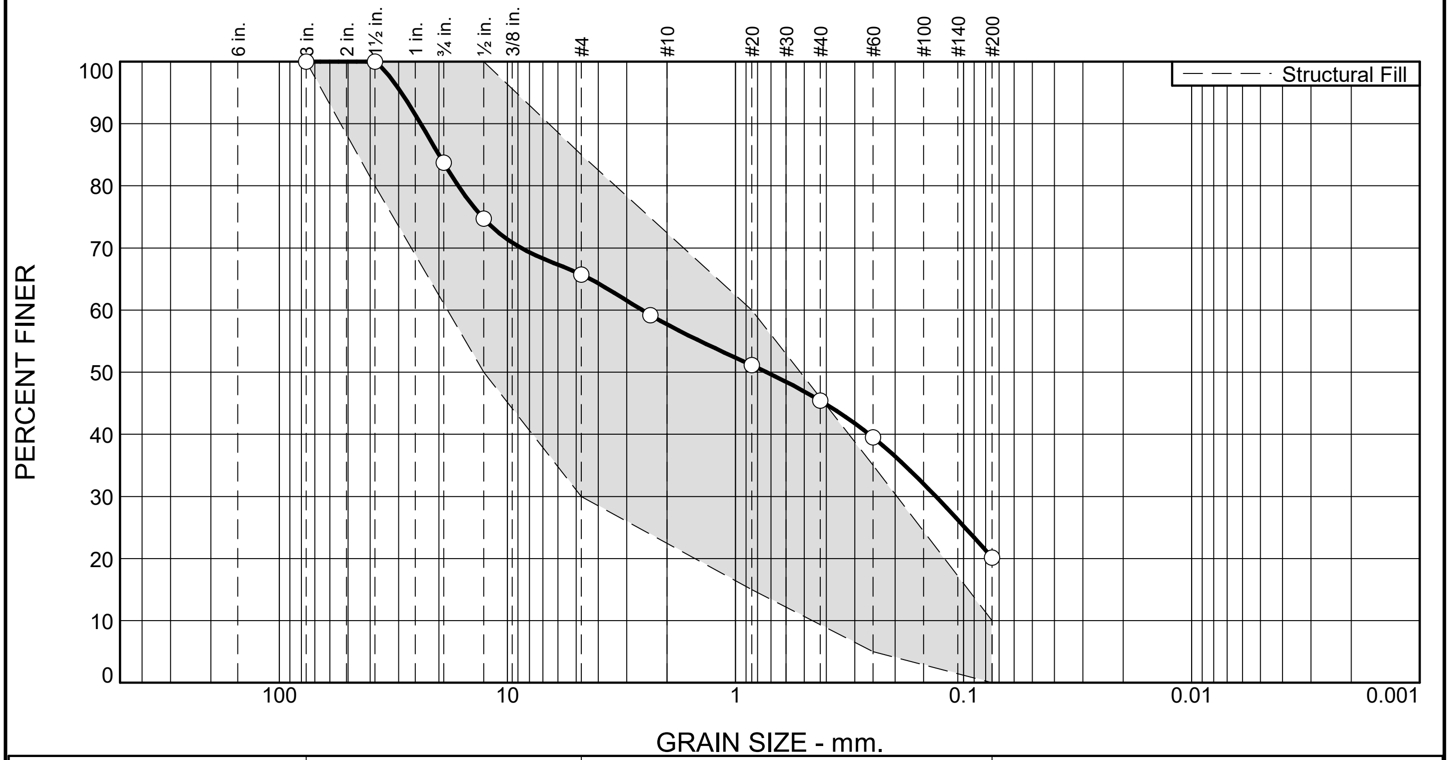
Checked By: MC

Source of Sample: Test Pit TP-120 **Depth:** 5' - 12' **Date Sampled:** 2/23/2018
Sample Number: S3

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts
Project No: 1644

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	16.3	18.0	8.0	12.3	25.2	20.2

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0	100.0	
1.5	100.0	80.0 - 100.0	
0.75	83.7		
0.5	74.7	50.0 - 100.0	
#4	65.7	30.0 - 85.0	
#8	59.2		
#20	51.1	15.0 - 60.0	
#40	45.4		
#60	39.5	5.0 - 35.0	X
#200	20.2	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 30-35% fine to coarse subrounded gravel, trace organic fines, trace roots, wood, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 24.0100 D_{85}= 19.9882 D_{60}= 2.5694
D_{50}= 0.7310 D_{30}= 0.1325 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill sample.

Date Received: 2/22/2018 **Date Tested:** 3/21/2018

Tested By: TS

Checked By: MC

Source of Sample: Test Pit TP-124 **Depth:** 1' - 7' **Date Sampled:** 2/22/2018
Sample Number: S2

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Lamoureux Pagano & Associates, Inc.
Project: Proposed Worcester South High School, Worcester, Massachusetts
Project No: 1644

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APPENDIX B

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APPENDIX C

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APPENDIX D

SOILS MANAGEMENT LETTER

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Lord Associates, Inc.
Environmental Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

February 12, 2018

Mr. Eric Moore
Lamoureaux Pagano Associates, Inc.
108 Grove Street, Suite 300
Worcester, Massachusetts 01605

RE: Arsenic in Soil Sample Results
Worcester South High School
Worcester, MA.

Dear Eric,

Pursuant to your request, Lord Associates, Inc. (LAI) has prepared the following summary of soil sampling results from the Worcester South High School project in Worcester, Massachusetts. The purpose of this soil sampling was to pre-characterize the arsenic content in soil that may be excavated during development of the property for a new school. Recommendations are offered for the on-site management of these soils.

Method

The locations of the samples were selected based on geotechnical considerations determined by Lahlaf Geotechnical Consulting, Inc. (LGCI). A series of exploratory test pits and test borings were completed by LGCI in August of 2017. The excavating and drilling services were provided by Northern Drill Services. Boring logs and geotechnical evaluation were provided to the client under separate cover.

LAI selected representative sub-samples from the geotechnical soil samples for total arsenic analyses by a state-certified laboratory (Alpha Analytical, Inc.). Initially samples were selected from the shallow soil horizon (generally 1-3' bsg). Based on these results, Additional samples were submitted for analyses from the maximum depth sampled (generally 3-12' bsg in test pits and 14-21' bsg in test borings). Soil types were generally observed to be a brown silty sand with gravel. Sub-samples were removed from the drillers jars or plastic bags and placed in laboratory prepared glass jars for transport to the analytical laboratory. The samples were analyzed for total solids and arsenic via EPA Methods 3050B and 6010C.

Results

The results of the testing for arsenic were compared to Massachusetts residential cleanup standards ("S-1/GW-2") as wells as the Comm -97-001 landfill parameter to allow for a wider range of disposal option selection. As shown on Table 1, arsenic was detected at concentrations ranging from 9 to 53 mg/kg. Twenty-six of the 31 samples had concentrations greater than the applicable standard of 20 mg/kg. The data collected from the shallow samples was comparable to that from the deeper samples collected (within one standard deviation). The average shallow concentration was 35 mg/kg, and the deeper concentration was 29 mg/kg. Six of the samples exceeded the 40 mg/kg Massachusetts landfill limit.

Opinion

Based on concentration ranges, site location and history, we are of the opinion that the source of the elevated arsenic is natural rock formations. The lack of a discernable vertical or horizontal distribution corroborates this opinion. As such, these concentrations are exempt from MADEP notification pursuant to the Massachusetts Contingency Plan (MCP) regulations (310 CMR 40.0317(22). Nevertheless, MADEP guidance and policy (WSC#-13-500) dictates that the soil be managed appropriately to limit exposure potential. Therefore, the following soil management recommendations are offered.

Recommendations

To limit exposure potential in proposed development areas where human activity is likely to be greater than other areas of the property such as playgrounds, athletic fields, and gardens, it is recommended that this naturally-occurring soil be either:

- buried at a depth at least three feet below surface grade with "clean" fill less than 20 mg/kg;
- located under permanent structures or pavement; or
- covered with filter fabric or other effective membrane under a minimum of 12 inches of "clean" topsoil (i.e., <20 mg/kg), mulch, or subgrade material for athletic field turf.

At other areas of the proposed development less accessible such as roadways or narrow strips between walkways, it will be acceptable to use these excavated soils as sub-grade fill under the design's landscaping, assuming appropriate measures are taken to mitigate erosion.

Off-site disposal options are restricted to "like" sites (as defined by MADEP WSC#13-500) or landfills that are permitted to accept soils as characterized. MADEP notification is not required to transport the soil for disposal. A standard Material Shipping Record may be used to document the material transport. We recommend you provide the prospective disposal facility with a copy of these results for their approval. We also recommend the use of Best Management Practices to control excess dust during excavation activities.

We would be pleased to assist you with the dust monitoring or in the selection of a disposal facility and/or to assist in the application process if needed. To do this we would require an estimate of the total cubic yardage and schedule for disposal.

Please contact me if you have any questions.

Sincerely,
LORD ASSOCIATES, INC.

Ralph J. Tella

Ralph J. Tella, LSP, CHMM
President and Senior Project Manager

Attached: Site Plans
Table 1 Soil Results Summary
Copy of Laboratory Results

APPENDIX E

ARSENIC ANALYTICAL REPORT

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ANALYTICAL REPORT

Lab Number:	L1739826
Client:	Lord Associates, Inc. 1506 Providence Highway - Suite 30 Norwood, MA 02062
ATTN:	Jon Puliafico
Phone:	(781) 255-5554
Project Name:	VEC-WORCESTER SOUTH
Project Number:	2604
Report Date:	11/10/17

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: VEC-WORCESTER SOUTH
Project Number: 2604

Lab Number: L1739826
Report Date: 11/10/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1739826-01	B-1 0'-2'	SOIL	Not Specified	08/11/17 00:00	11/01/17
L1739826-02	B-2 0'-2'	SOIL	Not Specified	08/10/17 00:00	11/01/17
L1739826-03	B-3 0'-2'	SOIL	Not Specified	08/11/17 00:00	11/01/17
L1739826-04	B-4 0'-2'	SOIL	Not Specified	08/10/17 00:00	11/01/17
L1739826-05	B-5 0'-2'	SOIL	Not Specified	08/10/17 00:00	11/01/17
L1739826-06	B-6 0'-2'	SOIL	Not Specified	08/10/17 00:00	11/01/17
L1739826-07	B-7 0'-2'	SOIL	Not Specified	08/11/17 00:00	11/01/17
L1739826-08	B-8 0.5'-2'	SOIL	Not Specified	08/11/17 00:00	11/01/17
L1739826-09	TP-3 10"-3'2"	SOIL	Not Specified	08/15/17 00:00	11/01/17
L1739826-10	TP-4 1'4"-2'6"	SOIL	Not Specified	08/15/17 00:00	11/01/17
L1739826-11	TP-5 11"-2'	SOIL	Not Specified	08/14/17 00:00	11/01/17
L1739826-12	TP-6 0"-10"	SOIL	Not Specified	08/14/17 00:00	11/01/17
L1739826-13	TP-7 7"-18"	SOIL	Not Specified	08/14/17 00:00	11/01/17
L1739826-14	TP-8 8"-2'2"	SOIL	Not Specified	08/14/17 00:00	11/01/17
L1739826-15	TP-10 7"-2'	SOIL	Not Specified	08/14/17 00:00	11/01/17

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes per the Chain of Custody.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris Michelle M. Morris

Title: Technical Director/Representative Date: 11/10/17

METALS

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-01	Date Collected:	08/11/17 00:00
Client ID:	B-1 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	85%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	43.3		mg/kg	0.464	--	1	11/02/17 22:55	11/09/17 18:33	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-02	Date Collected:	08/10/17 00:00
Client ID:	B-2 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	80%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	36.8		mg/kg	0.486	--	1	11/02/17 22:55	11/09/17 18:38	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-03	Date Collected:	08/11/17 00:00
Client ID:	B-3 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	34.6		mg/kg	0.439	--	1	11/02/17 22:55	11/09/17 18:42	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-04	Date Collected:	08/10/17 00:00
Client ID:	B-4 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	87%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	32.4		mg/kg	0.441	--	1	11/02/17 22:55	11/09/17 18:47	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-05	Date Collected:	08/10/17 00:00
Client ID:	B-5 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	87%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	26.2		mg/kg	0.453	--	1	11/02/17 22:55	11/09/17 18:52	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-06	Date Collected:	08/10/17 00:00
Client ID:	B-6 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	42.0		mg/kg	0.460	--	1	11/02/17 22:55	11/09/17 18:57	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-07	Date Collected:	08/11/17 00:00
Client ID:	B-7 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	85%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	33.9		mg/kg	0.458	--	1	11/02/17 22:55	11/09/17 19:01	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-08	Date Collected:	08/11/17 00:00
Client ID:	B-8 0.5'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	16.9		mg/kg	0.464	--	1	11/02/17 22:55	11/09/17 19:15	EPA 3050B	97,6010C	AB

SAMPLE RESULTS

Lab ID:	L1739826-09	Date Collected:	08/15/17 00:00
Client ID:	TP-3 10"-3'2"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	85%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	40.2		mg/kg	0.455	--	1	11/02/17 22:55	11/09/17 19:20	EPA 3050B	97,6010C	AB

SAMPLE RESULTS

Lab ID: L1739826-10
Date Collected: 08/15/17 00:00
Client ID: TP-4 1'4"-2'6"
Date Received: 11/01/17
Sample Location: Not Specified
Field Prep: Not Specified
Matrix: Soil
Percent Solids: 96%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	35.8		mg/kg	0.400	--	1	11/02/17 22:55	11/09/17 19:25	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-11	Date Collected:	08/14/17 00:00
Client ID:	TP-5 11"-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	35.1		mg/kg	0.433	--	1	11/02/17 22:55	11/09/17 19:30	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-12	Date Collected:	08/14/17 00:00
Client ID:	TP-6 0"-10"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	79%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	35.1		mg/kg	0.492	--	1	11/02/17 22:55	11/09/17 19:34	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-13	Date Collected:	08/14/17 00:00
Client ID:	TP-7 7"-18"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	90%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	42.1		mg/kg	0.428	--	1	11/02/17 22:55	11/09/17 19:39	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-14	Date Collected:	08/14/17 00:00
Client ID:	TP-8 8"-2'2"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	90%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	37.6		mg/kg	0.439	--	1	11/02/17 22:55	11/09/17 19:44	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-15	Date Collected:	08/14/17 00:00
Client ID:	TP-10 7"-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	92%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	33.1		mg/kg	0.410	--	1	11/02/17 22:55	11/09/17 19:49	EPA 3050B	97,6010C	AB

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-15 Batch: WG1059096-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	11/02/17 22:55	11/09/17 18:19	97,6010C	AB

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis
Batch Quality Control

Project Name: VEC-WORCESTER SOUTH
Lab Number: L1739826
Project Number: 2604
Report Date: 11/10/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-15 Batch: WG1059096-2 WG1059096-3 SRM Lot Number: D098-540								
Arsenic, Total	97		100		83-117	3		30

INORGANICS
&
MISCELLANEOUS

SAMPLE RESULTS

Lab ID: L1739826-01
Client ID: B-1 0'-2'
Sample Location: Not Specified
Matrix: Soil

Date Collected: 08/11/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.6		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-02	Date Collected:	08/10/17 00:00
Client ID:	B-2 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	80.0		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID:	L1739826-03	Date Collected:	08/11/17 00:00
Client ID:	B-3 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.4		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID:	L1739826-04	Date Collected:	08/10/17 00:00
Client ID:	B-4 0'-2'	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.6		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-05
Client ID: B-5 0'-2'
Sample Location: Not Specified
Matrix: Soil
Date Collected: 08/10/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.9		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-06
Client ID: B-6 0'-2'
Sample Location: Not Specified
Matrix: Soil

Date Collected: 08/10/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.6		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-07
Client ID: B-7 0'-2'
Sample Location: Not Specified
Matrix: Soil

Date Collected: 08/11/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.5		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-08
Client ID: B-8 0.5'-2'
Sample Location: Not Specified
Matrix: Soil
Date Collected: 08/11/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.1		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID:	L1739826-09	Date Collected:	08/15/17 00:00
Client ID:	TP-3 10"-3'2"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**	**Date Prepared**	**Date Analyzed**	**Analytical Method**	**Analyst**
General Chemistry - Westborough Lab										
Solids, Total	84.8		%	0.100	NA	1	-	11/08/17 11:06	121,2540G	RI

SAMPLE RESULTS

Lab ID:	L1739826-10	Date Collected:	08/15/17 00:00
Client ID:	TP-4 1'4"-2'6"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**	**Date Prepared**	**Date Analyzed**	**Analytical Method**	**Analyst**
General Chemistry - Westborough Lab										
Solids, Total	95.7		%	0.100	NA	1	-	11/08/17 11:06	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1739826-11
Client ID: TP-5 11"-2'
Sample Location: Not Specified
Matrix: Soil
Date Collected: 08/14/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91.4		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

Project Name:	VEC-WORCESTER SOUTH	**Lab Number:**	L1739826
Project Number:	2604	**Report Date:**	11/10/17

SAMPLE RESULTS

Lab ID:	L1739826-12	Date Collected:	08/14/17 00:00
Client ID:	TP-6 0"-10"	Date Received:	11/01/17
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	79.3		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-13
Client ID: TP-7 7"-18"
Sample Location: Not Specified
Matrix: Soil

Date Collected: 08/14/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.3		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-14
Client ID: TP-8 8"-2'2"
Sample Location: Not Specified
Matrix: Soil
Date Collected: 08/14/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.3		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1739826-15
Client ID: TP-10 7"-2'
Sample Location: Not Specified
Matrix: Soil
Date Collected: 08/14/17 00:00
Date Received: 11/01/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92.3		%	0.100	NA	1	-	11/08/17 00:45	121,2540G	FN

Lab Duplicate Analysis
Batch Quality Control

Project Name: VEC-WORCESTER SOUTH
Project Number: 2604

Lab Number: L1739826
Report Date: 11/10/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 09-10 QC Batch ID: WG1060864-1 QC Sample: L1739826-09 Client ID: TP-3 10"-3'2"						
Solids, Total	84.8	85.0	%	0		20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	*Custody Seal*
A	Absent

Container Information

Container ID	*Container Type*	*Cooler*	*Initial pH*	*Final pH*	*Temp deg C*	*Pres*	*Seal*	*Frozen Date/Time*	*Analysis(*)*
L1739826-01A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-01B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-02A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-02B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-03A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-03B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-04A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-04B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-05A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-05B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-06A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-06B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-07A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-07B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-08A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-08B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-09A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-09B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-10A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-10B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-11A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-11B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-12A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Container Information

Container ID	*Container Type*	*Cooler*	*Initial pH*	*Final pH*	*Temp deg C*	*Pres*	*Seal*	*Frozen Date/Time*	*Analysis(*)*
L1739826-12B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-13A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-13B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-14A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-14B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)
L1739826-15A	Glass 60ml unpreserved split	A	NA		3.3	Y	Absent		MCP-AS-6010T-10(180)
L1739826-15B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The lower value for the two columns has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
P	- The RPD between the results for the two columns exceeds the method-specified criteria.
Q	- The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
R	- Analytical results are from sample re-analysis.
RE	- Analytical results are from sample re-extraction.
S	- Analytical results are from modified screening analysis.
J	- Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
ND	- Not detected at the reporting limit (RL) for the sample.

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Serial_No:11101713:09

Alpha Analytical, Inc. ID No.:**17873**
Facility: **Company-wide** Revision 10
Department: **Quality Assurance** Published Date: 1/16/2017 11:00:05 AM
Title: **Certificate/Approval Program Summary** Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

ALPHA ANALYTICAL

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 11/1/17

ALPHA Job #: L1739826

Client Information

Client: Lord Associates
Address: Norwood
Phone:
Email: jpuliafico@lordenv.com

Additional Project Information:

Project Information

Project Name: UEC - Worcester South
Project Location:
Project #: 2604
Project Manager: Jon Puliafico
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program MADEP Criteria S-1

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	Arsenic					Sample Comments	TOTAL # BOTTLES
39826-01	B-1 0'-2'	8/11/17		S	HK-JP									X						1
02	B-2 0'-2'	8/10/17		S										X						1
03	B-3 0'-2'	8/11/17		S										X						1
04	B-4 0'-2'	8/10/17		S										X						1
05	B-5 0'-2'	8/10/17		S										X						1
06	B-6 0'-2'	8/10/17		S										X						1
07	B-7 0'-2'	8/11/17		S										X						1
08	B-8 0.5'-2'	8/4/17		S										X						1
					Container Type									A						
					Preservative									A						

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
	11/1/17 9:00	AAL	11/1/17 1255
AAL	11/1/17 1637		11/1/17 1637

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ALPHA ANALYTICAL

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 11/1/17

ALPHA Job #: L1739826

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: Lord Associates
Address: Norwood
Phone:
Email: jpuliafico@lordenv.com

Additional Project Information:

Project Information

Project Name: UBC-Worcester South
Project Location:
Project #: 2604
Project Manager: Jim Puliafico
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program MADEP Criteria S-1

ANALYSIS
VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint
Arsenic

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Arsenic	Sample Comments	TOTAL # BOTTLES
39826-09	TP-3 10"-3'2"	8-15-17		S	HR-JP	X		1
10	TP-4 1'4"-2'6"	8-15-17		S	↓	X		1
11	TP-5 11"-2'	8-14-17		S		X		1
12	TP-6 0"-10"	↓		S		X		1
13	TP-7 7"-18"			S		X		1
14	TP-8 8"-2'2"			S		X		1
15	TP-10 7"-2'			S		X		1

	Arsenic
Container Type	A
Preservative	A

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
	11/1/17 9:00		11/1/17 1255
AAL	11/1/17 1637		11/1/17 1637

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

APPENDIX F

ARSENIC ANALYTICAL REPORT - DEEP

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ANALYTICAL REPORT

Lab Number:	L1807951
Client:	Lord Associates, Inc. 1506 Providence Highway - Suite 30 Norwood, MA 02062
ATTN:	Ralph Tella
Phone:	(781) 255-5554
Project Name:	WORC. SO
Project Number:	2604
Report Date:	03/15/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1807951-01	B-114, 4-6'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-02	B-120A, 8-10'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-03	B-116, 19-21'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-04	B-12, 6-8'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-05	B-118B, 24-26'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-06	B-119A, 8-10'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-07	B-119A, 24-25.7'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-08	B-117B, 8-10'	SOIL	BORINGS	03/02/18 00:00	03/08/18
L1807951-09	B-117B, 19-21'	SOIL	BORINGS	03/02/18 00:00	03/08/18

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris Michelle M. Morris

Title: Technical Director/Representative

Date: 03/15/18

METALS

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-01	Date Collected:	03/02/18 00:00
Client ID:	B-114, 4-6'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	90%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	35.8		mg/kg	0.436	--	1	03/14/18 19:26	03/14/18 23:32	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-02	Date Collected:	03/02/18 00:00
Client ID:	B-120A, 8-10'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	87%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	39.7		mg/kg	0.450	--	1	03/14/18 19:26	03/14/18 23:36	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-03	Date Collected:	03/02/18 00:00
Client ID:	B-116, 19-21'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	90%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	16.2		mg/kg	0.432	--	1	03/14/18 19:26	03/14/18 23:41	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-04	Date Collected:	03/02/18 00:00
Client ID:	B-12, 6-8'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	89%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	61.3		mg/kg	0.434	--	1	03/14/18 19:26	03/14/18 23:58	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-05	Date Collected:	03/02/18 00:00
Client ID:	B-118B, 24-26'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	90%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	13.4		mg/kg	0.428	--	1	03/14/18 19:26	03/15/18 00:02	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-06	Date Collected:	03/02/18 00:00
Client ID:	B-119A, 8-10'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	88%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	41.4		mg/kg	0.443	--	1	03/14/18 19:26	03/15/18 00:07	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-07	Date Collected:	03/02/18 00:00
Client ID:	B-119A, 24-25.7'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	89%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	70.4		mg/kg	0.434	--	1	03/14/18 19:26	03/15/18 00:11	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-08	Date Collected:	03/02/18 00:00
Client ID:	B-117B, 8-10'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	87%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	47.2		mg/kg	0.436	--	1	03/14/18 19:26	03/15/18 00:15	EPA 3050B	1,6010C	AB

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-09	Date Collected:	03/02/18 00:00
Client ID:	B-117B, 19-21'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	90%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	16.7		mg/kg	0.425	--	1	03/14/18 19:26	03/15/18 00:20	EPA 3050B	1,6010C	AB

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-09 Batch: WG1097091-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/14/18 19:26	03/14/18 22:17	1,6010C	AB

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC. SO
Lab Number: L1807951
Project Number: 2604
Report Date: 03/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-09 Batch: WG1097091-2 SRM Lot Number: D098-540								
Arsenic, Total	102		-		83-117	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: WORC. SO
Project Number: 2604

Lab Number: L1807951
Report Date: 03/15/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1097091-3 QC Sample: L1808457-01 Client ID: MS Sample												
Arsenic, Total	1.50	10.8	12.2	99		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: WORC. SO
Project Number: 2604

Lab Number: L1807951
Report Date: 03/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1097091-4 QC Sample: L1808457-01 Client ID: DUP Sample						
Arsenic, Total	1.50	1.59	mg/kg	6		20

INORGANICS
&
MISCELLANEOUS

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-01	Date Collected:	03/02/18 00:00
Client ID:	B-114, 4-6'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89.7		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1807951-02
Client ID: B-120A, 8-10'
Sample Location: BORINGS
Sample Depth:
Matrix: Soil

Date Collected: 03/02/18 00:00
Date Received: 03/08/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.8		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-03	Date Collected:	03/02/18 00:00
Client ID:	B-116, 19-21'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89.6		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-04	Date Collected:	03/02/18 00:00
Client ID:	B-12, 6-8'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89.3		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1807951-05
Client ID: B-118B, 24-26'
Sample Location: BORINGS
Sample Depth:
Matrix: Soil

Date Collected: 03/02/18 00:00
Date Received: 03/08/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89.8		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1807951-06
Client ID: B-119A, 8-10'
Sample Location: BORINGS
Sample Depth:
Matrix: Soil

Date Collected: 03/02/18 00:00
Date Received: 03/08/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	87.6		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-07	Date Collected:	03/02/18 00:00
Client ID:	B-119A, 24-25.7'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89.2		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1807951-08
Client ID: B-117B, 8-10'
Sample Location: BORINGS
Sample Depth:
Matrix: Soil

Date Collected: 03/02/18 00:00
Date Received: 03/08/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.6		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

Project Name:	WORC. SO	**Lab Number:**	L1807951
Project Number:	2604	**Report Date:**	03/15/18

SAMPLE RESULTS

Lab ID:	L1807951-09	Date Collected:	03/02/18 00:00
Client ID:	B-117B, 19-21'	Date Received:	03/08/18
Sample Location:	BORINGS	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.3		%	0.100	NA	1	-	03/09/18 11:29	121,2540G	RI

Lab Duplicate Analysis

Batch Quality Control

Project Name: WORC. SO
Project Number: 2604

Lab Number: L1807951
Report Date: 03/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-09 QC Batch ID: WG1095922-1 QC Sample: L1808065-01 Client ID: DUP Sample						
Solids, Total	85.7	87.4	%	2		20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	*Custody Seal*
A	Absent

Container Information

Container ID	*Container Type*	*Cooler*	*Initial pH*	*Final pH*	*Temp deg C*	*Pres*	*Seal*	*Frozen Date/Time*	*Analysis(*)*
L1807951-01A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-01B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-02A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-02B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-03A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-03B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-04A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-04B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-05A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-05B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-06A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-06B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-07A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-07B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-08A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-08B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)
L1807951-09A	Glass 60ml unpreserved split	A	NA		3.2	Y	Absent		AS-TI(180)
L1807951-09B	Glass 250ml/8oz unpreserved	A	NA		3.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. ID No.:**17873**
Facility: **Company-wide** Revision 11
Department: **Quality Assurance** Published Date: 1/8/2018 4:15:49 PM
Title: **Certificate/Approval Program Summary** Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 3/8/18

ALPHA Job #: L1807951

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: LORD Assoc. Inc.
Address: 1506 PROV. Suite 30
NORWOOD, MA.
Phone: 781-255-5554
Email: RTELLA@LORDENV.com

Project Information

Project Name: Worc So
Project Location: BORINGS
Project #: 2604
Project Manager: RALPH
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Additional Project Information:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☒ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program ____ Criteria ____

ANALYSIS

- VOC: ☐ 8260 ☐ 624 ☐ 524.2
- SVOC: ☐ ABN ☐ PAH
- METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
- METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
- EPH: ☐ Ranges & Targets ☐ Ranges Only
- VPH: ☐ Ranges & Targets ☐ Ranges Only
- ☐ PCB ☐ PEST
- TPH: ☐ Quant Only ☐ Fingerprint
- TOTAL Arsenic

SAMPLE INFO

Filtration
☐ Field
☐ Lab to do

Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	(B-114) Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	TOTAL Arsenic	Sample Comments	TOTAL # BOTTLES
07951-01	B-~~##~~4, 4-6'	3/2/18	N/A	S	ML	X		
02	B-120A, 8-10'	↓	↓	↓	↓	↓		
03	B-116, 19-21'	↓	↓	↓	↓	↓		
04	B-12, 6-8'	↓	↓	↓	↓	↓		
05	B-118B, 24-26'	↓	↓	↓	↓	↓		
06	B-119A, 8-10'	↓	↓	↓	↓	↓		
07	B-119A, 24-25.7'	↓	↓	↓	↓	↓		
08	B-117B, 8-10	↓	↓	↓	↓	↓		
09	B-117B, 19-21'	↓	↓	↓	↓	↓		

	VOC	TOTAL Arsenic
Container Type	G	G
Preservative	A	A

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
R Tella	3/5/18		3/8/18 1200
T. Archibald	3/8/18 1730		3/8/18 1730

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side

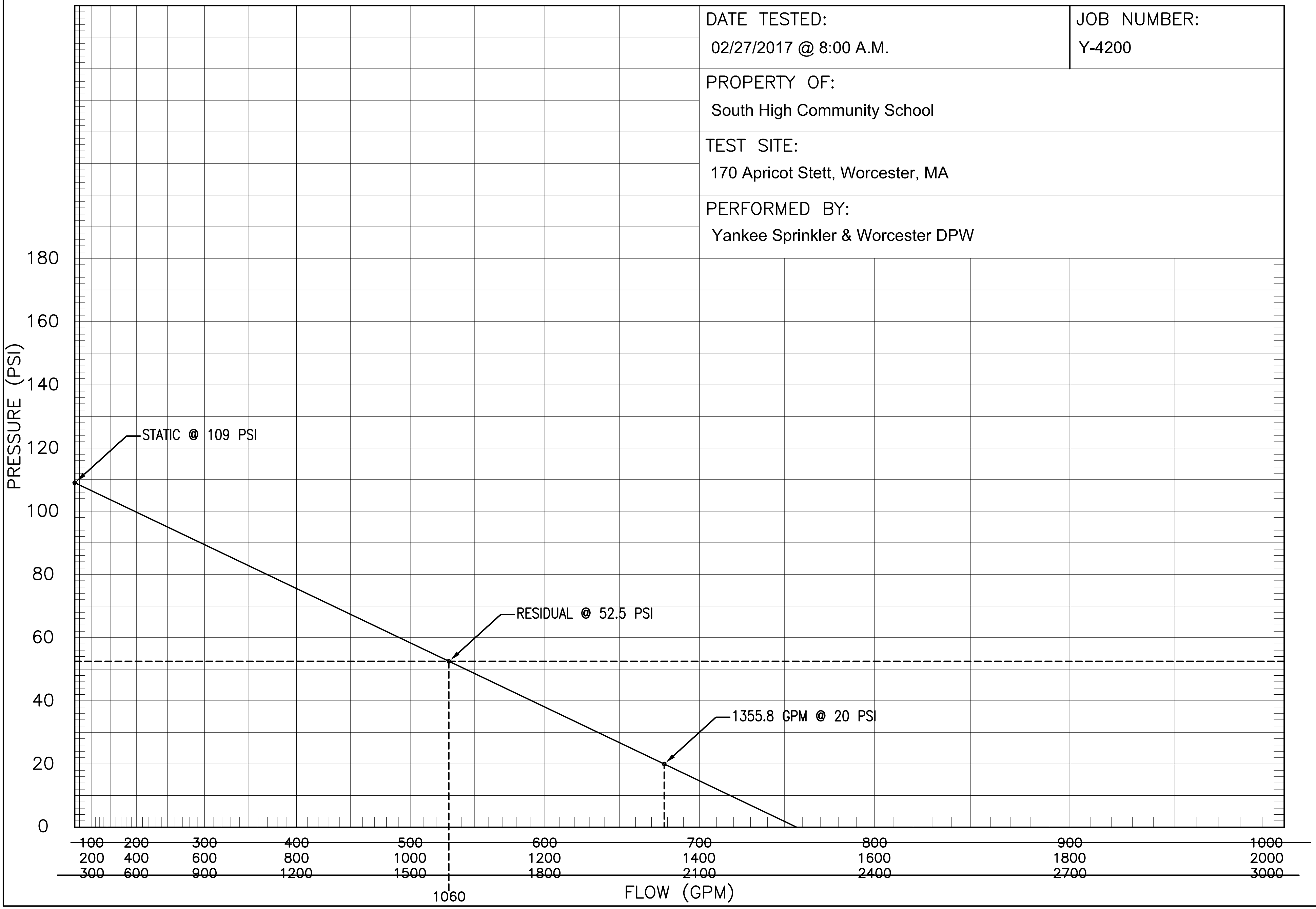
FORM NO: 01-01 (rev. 12-Mar-2012)

APPENDIX G

HYDRANT FLOW

DO NOT REMOVE
THIS PAGE INTENTIONALLY LEFT BLANK

WATER SUPPLY GRAPH - N $^{1.85}$ HYDRAULIC GRAPH PAPER



DATE TESTED:
02/27/2017 @ 8:00 A.M.

JOB NUMBER:
Y-4200

PROPERTY OF:
South High Community School

TEST SITE:
170 Apricot Stett, Worcester, MA

PERFORMED BY:
Yankee Sprinkler & Worcester DPW

DO NOT REMOVE
THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX H

WPA FORM 4B

ORDER OF RESOURCE AREA DELINEATION

For Registry of Deeds Use Only

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1171
MassDEP File Number

eDEP Transaction Number

Worcester
City/Town

A. General Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

From: City of Worcester
1. Conservation Commission

2. This Issuance is for (check one):

   a. ☒ Order of Resource Area Delineation

   b. ☐ Amended Order of Resource Area Delineation

3. Applicant:

a. First Name | b. Last Name

City of Worcester – Department of Public Works & Parks
c. Organization

20 E. Worcester Street
d. Mailing Address

Worcester | MA | 01604
e. City/Town | f. State | g. Zip Code

4. Property Owner (if different from applicant):

a. First Name | b. Last Name

City of Worcester - School Department
c. Organization

20 Irving Street
d. Mailing Address

Worcester | MA | 01609
e. City/Town | f. State | g. Zip Code

5. Project Location:

140 & 170 Apricot Street;
Adjacent parts of 11 & 51 Goddard Memorial Dr.
a. Street Address

Worcester
b. City/Town

c. Zip Code

140 & 170 Apricot Street: 56-016 | -00013
11 Goddard Memorial Dr.: 56-016 | -00003
51 Goddard Memorial Dr.: 56-016 | -00011
d. Assessors Map/Plat Number | e. Parcel/Lot Number

Latitude and Longitude (in degrees, minutes, seconds):
d m s
f. Latitude
d m s
g. Longitude

6. Dates:
7/11/2017
a. Date ANRAD filed
7/31/2017
b. Date Public Hearing Closed
8/21/2017
c. Date of Issuance

A. General Information (cont.)

7. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

ANRAD Application Materials a. Title	Received 7/11/2017 b. Date
Existing Conditions Plan – Worcester South Community School c. Title	6/30/2017; last Revised 8/8/2017 d. Date

B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable):

a. ☐ **Accurate**: The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands

2. ☐ Other resource area(s), specifically:

a.

b. ☒ **Modified**: The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn for the following resource area(s):

1. ☒ **Bordering Vegetated Wetlands (BVW)**

2. ☒ Other resource area(s), specifically: **Bank; and Riverfront Area**

a. Modifications included: Adding an additional BVW, with flag series CR (CR200-CR2010) which was field delineated during a site walk on 7/30/2017. See revised "Existing Conditions Plan – Worcester South Community School", prepared by Nitsch Engineering; last revised 8/8/2017. Note: Sheet EX-5 of the plan shows this modification - via the addition of such flagging (CR200-CR2010) which is located to the west of the existing dirt access road.

c. ☐ **Inaccurate**: The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Resource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands

2. ☐ Other resource area(s), specifically:

B. Order of Delineation (cont.)

3. ☐ The boundaries were determined to be inaccurate because:

C. Findings

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, § 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation.

This Order must be signed by a majority of the Conservation Commission. The Order must be sent by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/find-the-massdep-regional-office-for-your-city-or-town.html).

D. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate DEP Regional Office to issue a Superseding Order of Resource Area Delineation. When requested to issue a Superseding Order of Resource Area Delineation, the Department's review is limited to the objections to the resource area delineation(s) stated in the appeal request. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order of Resource Area Delineation will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order or Determination, or providing written information to the Department prior to issuance of a Superseding Order or Determination.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act, (M.G.L. c. 131, § 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.

140+170 Apricot St.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1171
MassDEP File Number

eDEP Transaction Number

Worcester
City/Town

8/22/17
Date of Issuance

E. Signatures

Please indicate the number of members who will sign this form.

5
1. Number of Signers

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, which expires on unless extended in writing by the issuing authority.

This Order is issued to the applicant and the property owner (if different) as follows:

2. ☒ By hand delivery on
8/22/2017
a. Date

3. ☐ By certified mail, return receipt requested on
a. Date

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

✓ tab

return ✗

2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

- ☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)
- ☐ Superseding Determination of Applicability – Fee: $120
- ☐ Superseding Order of Resource Area Delineation – Fee: $120

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

B. Instructions (cont.)

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

eDEP Transaction Number

City/Town

Recording Information

Prior to commencement of work, this Order of Resource Area Delineation must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Resource Area Delineation. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Resource Area Delineation for the Project at:

Project Location

MassDEP File Number

Has been recorded at the Registry of Deeds of:

County

Book

Page

For:

Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Resource Area Delineation issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

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APPENDIX I

PHASE I ENVIRONMENTAL SITE ASSESSMENT

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Lord Associates, Inc.
Environmental Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

PHASE I-ENVIRONMENTAL SITE ASSESSMENT

School Property
170 Apricot Street
Worcester, Massachusetts

Prepared for:

Mr. Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702-6218

Prepared by:

Lord Associates, Inc.
1506 Providence Highway, Suite 30
Norwood, Massachusetts 02062

Project # 2467

November 16, 2016

Lord Associates, Inc.
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November 16, 2016

Mr. Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702-6218

RE: Phase I Environmental Site Assessment
170 Apricot Street
Worcester, Massachusetts

Dear Mr. Dieb:

Lord Associates, Inc. has completed a Phase I Environmental Site Assessment of the referenced property (the "Site"). Environmental investigations were completed with consideration to standard industry practice, the ASTM E-1527 site assessment standard entitled "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process". The purpose of this assessment was to identify "Recognized Environmental Conditions" as defined in ASTM E-1527-13, and to determine if additional investigation is warranted.

This assessment has not identified any Recognized Environmental Conditions (RECs) in connection with the property, 170 Apricot Street in Worcester, Massachusetts:

Please refer to the attached report for specific details and findings of our assessment. We appreciate the opportunity to have provided our professional environmental consulting and analytical services.

Sincerely,
LORD ASSOCIATES, INC.

Ralph J. Tella

Ralph Tella, CHMM, LSP
President
Enc.: Phase I ESA

Andrea J. Lang
Project Manager

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose

Lord Associates, Inc. (LAI) has completed a Phase I Environmental Site Assessment for 170 Apricot Street, Worcester, Massachusetts (the "Site"). The purpose of this assessment was to identify "Recognized Environmental Conditions" as defined in ASTM standard E-1527-13 (the Standard), and to determine if additional investigation is warranted.

Recognized Environmental Conditions are defined as the presence or likely presence of any hazardous substances or petroleum products on the property under conditions that indicate an existing release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term Recognized Environmental Conditions is not intended to include *de minimis* conditions which generally do not present a material risk of harm to public health or the environment, and that generally would not be the subject of a notification and/or enforcement action if brought to the attention of appropriate governmental agencies.

The Phase I consisted of a Site reconnaissance and an assessment of the Site and surrounding properties for visual and/or olfactory evidence of the use, storage, and/or release of oil and/or hazardous material. The Phase I also included a review of federal, state, and local agency files regarding the history of the Site and surrounding area relative to the use, storage and/or release of oil and/or hazardous material.

Please note that an investigation for the presence of mold, asbestos and PCBs in building materials, lead-based paint, indoor air quality, or regulatory compliance is beyond the scope of work described by ASTM E 1527-13, therefore LAI did not explore those conditions.

1.2 Significant Assumptions

Factual information regarding operations, conditions, and other data provided by the Client, site contacts, third parties, and governmental agencies are assumed to be correct and complete.

1.3 Special Terms and Conditions

The Phase I ESA was conducted by LAI on behalf of the Client consistent with the agreed upon Scope of Work and LAI Standard Terms and Conditions. No other special terms and conditions were established in connection with these services.

2.0 SCOPE OF SERVICES

This assessment was performed following standard industry practice and with consideration to the ASTM E-1527-13 site assessment standard entitled "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. The investigation included completion of the following tasks:

1. A field investigation was performed including a visual surficial inspection of the Site and abutting properties; and

2. The following agencies were contacted to inquire of past ownership, complaints, or violations concerning environmental issues at the Site and vicinity.

    - The Massachusetts Department of Environmental Protection (MADEP)
    - The Worcester Tax Assessor's Office
    - The Worcester Town Clerk's Office
    - The Worcester Board of Health
    - The Worcester Building Department
    - The Worcester Water Department
    - The Worcester Conservation Commission
    - The Worcester Fire Prevention Office
    - Environmental Data Resources
    - Sanborn Fire Insurance Maps

3.0 SITE DESCRIPTION

3.1 Site Location and Parcel Legal Description

Information provided indicates that the Site consists of one lot totaling approximately 42.6 acres of land located at the north side of Apricot Street in Worcester, Massachusetts. A Site Location Map is included as **Figure 1**. The Site is designated as Parcel ID 56-016-00013 with the Worcester Tax Assessor's Department. The Tax Assessor's Map is included as **Figure 2** and a Site Plan depicting pertinent Site features is included as **Figure 3**.

Information provided indicates the Site longitude and latitude are approximately -71.863925° west and 42.244457° north, respectively. Universal Transverse Mercatur (UTM) coordinates are approximately 4,680,676 meters north by 263,710 meters east.

3.2 Site and Vicinity General Characteristics

According to municipal records, the Site is approximately 42.6 acres. The Site property is located in an area zoned as Residential Limited (RL-7). The Lot is occupied by two school buildings; Dr. Arthur Sullivan Middle School and South High Community School. South High Community School is the only building included in this assessment. The school building is a Worcester high school. The building has a footprint of approximately 244,486 square feet and is located on the southwest portion of the lot. Paved parking areas and driveways exist on the south, east and west sides of the Site building. Walkways and a small playground exist on the north side of the building.

A track exists to the north of the Site. Dr. Arthur Sullivan Middle School exists to the east of the Site and residential properties exist to the south and west.

3.3 Current Property Use

The Site has been occupied by South High Community School since 1978.

3.4 Description of Improvements

The Site is improved with one two- and three-story building constructed on-slab. The building consists of offices, classrooms, cafeterias, an auto shop and pool and has a footprint of approximately 244,486 square feet. The building is located on the southwest portion of the lot. Paved parking areas and driveways exist on the south, east and west sides of the Site building. Walkways and a small playground exist on the north side of the building. According to assessor's records, the building was constructed in 1990. However, based on information provided by Maureen Binienda, the School Superintendent, the building was constructed in 1978. A detailed Site description is presented in **Section 4.0**.

3.4.1 Wastewater

Wastewater generated on-Site is discharged to the municipal sewer. No information pertaining to storm water handling and/or management was encountered during this assessment. No floor drains, sumps, oil/water separators or storm drains were observed in the building.

3.4.2 Water Supply

Water is supplied by the Town of Worcester; the connection date was not available through files reviewed.

3.4.3 Wells

No potable, groundwater monitoring, irrigation, injection, dry, or abandoned wells were observed or identified from the interviews or records reviewed.

3.4.4 Heating/Cooling System

Heat and cooling for the building is provided by approximately 20 electric air handling units located on the perimeter of the building. Natural gas-fired roof top HVAC units provided additional heat and cooling for the building.

3.4.5 Solid Waste Disposal

A solid waste compactor and recycling dumpster were observed on the south side of the building. There were no areas of solid waste disposal, mounds or depressions, or areas apparently filled or graded by non-natural causes suggesting solid waste disposal observed.

3.4.6 Storage Tanks

One 275-gallon diesel AST was observed in the maintenance area and is associated with the emergency generator.

One 2,400-gallon diesel UST was removed on July 10, 2007, from the west side of the building. Details regarding the UST removal are presented in **Section 5.1.6**.

3.4.7 Transformers, Hydraulic Equipment and Other Potential Evidence of the Potential Use of Polychlorinated Biphenyls

Polychlorinated Biphenyls (PCBs) can be found in hydraulic-oil filled electrical equipment (such as motors and pumps), capacitors or transformers, and fluorescent light ballasts manufactured prior to July 2, 1979.

One hydraulic elevator was observed in the building. The hydraulic reservoir for the elevator equipment was observed above the concrete floors; evidence of minor leaks and staining from the equipment was observed in the elevator equipment rooms. However, the equipment is located on a concrete floor; no cracks were observed in the floors.

One solid waste compactor was observed on the south side of the building. The hydraulic reservoir for the equipment was observed above the concrete pad; evidence of minor leaks and staining from the equipment was observed.

Two aboveground hydraulic automobile lifts were observed in the auto shop. Minor staining was observed on the concrete in the auto shop area. Based on operations in the auto shop classroom, minor staining associated with auto repairs is anticipated. Mr. Gregory Ricotti, the Head of the Auto Department reported that one underground hydraulic auto lift was removed from the auto shop in 1994. According to Mr. Ricotti, no leaking was observed from the hydraulic equipment at the time of the removal. No removal permits were available at the Fire or Building Departments.

No additional evidence of the potential use of polychlorinated biphenyls (PCBs) was observed on the Site during the inspections. Sampling of building materials for PCBs is beyond the scope of ASTM 1527-13.

3.5 Current Uses of Adjoining Properties

A track exists to the north of the Site. Dr. Arthur Sullivan Middle School exists to the east of the Site and residential properties exist to the south and west. No bulk fuel storage was observed on adjacent properties. The table below summarizes current abutting land usage.

Table 1
Area Land Usage

Usage	Orientation
Athletic track	North
Single-family residential homes	South
Dr. Arthur Sullivan Middle School	East
Single-family residential homes	West

4.0 USER PROVIDED INFORMATION

4.1 User Questionnaire

A summary of user provided information is provided below.

4.1 User Questionnaire

A User Questionnaire was provided to the user (Client) to assist the user and LAI in gathering information from the user that may be material to identifying RECs. The following answers were provided by the Client.	**Response Inquiry**
Name and title	Jeffrey Martin, Facilities Director
Tenure with Site	3 years
Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law?	NO
Are you aware of any Activity and Use Limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?	NO
As the user of this ESA do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	NO
Does the purchase price being paid for this property reasonably reflect the fair market value of the property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?	NA
Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example, as user:	NO
Do you know the past uses of the property?	NO
Do you know of specific chemicals that are present or once were present at the property?	NO
Do you know of spills or other chemical releases that have taken place at the property?	NO
Do you know of any environmental cleanups that have taken place at the property?	NO
As the user of this ESA, based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of contamination at the property?	NO

4.2 Title Records

LAI did not review the property title.

4.3 Environmental Liens, Activity and Use Limitations

The owner has no knowledge of environmental liens, and the agency check revealed no listing for an Activity and Use Limitation in connection with the Site.

4.4 Specialized Knowledge

No specialized knowledge of Recognized Environmental Conditions was provided to LAI by the owner or client.

4.5 Commonly Known or Reasonably Ascertainable Information

No commonly known or reasonably ascertainable information regarding Recognized Environmental Conditions was provided to LAI by the owner or client.

4.6 Valuation Reduction for Environmental Issues

No information regarding the sale price of the Site in comparison to the expected value of the property was provided to LAI by the owner or client.

4.7 Owner, Property Manager, and Occupant Information

According to the Worcester Assessor's Department, the current owner of the property is:

City of Worcester, School Department
Worcester, Massachusetts 01609

LAI conducted an interview with Mr. Timothy Fournier, the Maintenance Supervisor for the South High Community School. Mr. Fournier provided information regarding the history of the Site and operations at the Site.

4.8 Reason for Performing Phase I Study

A Phase I ESA is being conducted in connection with the redevelopment of the property.

5.0 RECORDS REVIEWS

A review of federal, state and local regulatory agency files was conducted in accordance with ASTM E-1527-13 standards to identify the use, generation, storage, treatment, disposal and/or release of oil and/or hazardous materials that may potentially impact the Site.

5.1 Municipal Offices

5.1.1 Assessor's Office

Lord Associates, Inc. visited the municipal Assessor's Office to review historical ownership information for the Site. This data was reviewed for the purposes of land use determination and should not be relied upon as a complete chain-of-title. The following table offers a summary of ownership information obtained at the assessor's office for the Site.

Table 2
Chain of Title

Grantee	Date of Acquisition	Book/Page
Earl R. Perry	Unknown	Unknown
City of Worcester	2/11/1974	5436/61

5.1.2 Board of Health

LAI made inquiries at the municipal Board of Health Department. No records of environmental concern were on-file for the Site.

5.1.3 Building Department

A review of files was requested at the municipal Building Department to obtain information on historical building alterations. Building department records were available dating back to 2001, prior to 2001 records were archived. No records of environmental significance were on-file.

5.1.4 Conservation Commission

A review of files was requested at the municipal Conservation Commission regarding environmental violations. No records were available pertaining to the Site.

5.1.5 Clerk’s Office

A review of files was requested at the municipal Clerk’s Office regarding environmental violations. No records were available pertaining to the Site.

5.1.6 Fire Department

LAI requested a review of information regarding the storage of hazardous materials at the Site from the municipal Fire Prevention Office. One 2,400-gallon diesel UST was removed on July 10, 2007, from the west side of the building. A UST Closure report prepared by Corporate Environmental Advisors, Inc. (CEA) dated November 28, 2007 was reviewed at the Fire Prevention Office. Two small holes were observed in the tank. However, laboratory results of the confirmatory soil samples indicated that no concentrations of EPH were detected exceeding regulatory standards.

5.2 Sanborn/Historical Map Review

Sanborn Fire Insurance Maps were reviewed for the Site and vicinity. Sanborn Maps usually show property use and underground commercial fuel storage for the purposes of insurance companies. No Sanborn Maps were available for the Site and vicinity.

5.3 Historical Aerial Photograph Review

Aerial photographs from 1960, 1963, 1966, 1971, 1972, 1996, 1997, 2001, 2003, 2004, 2005, 2008, 2009, 2010, and 2012 were reviewed through the Historic Aerials website (www.historicaerials.com) and a current 2016 aerial photograph was reviewed from Google Earth. The following table summarizes the aerial photographs review.

Table 3
Aerial Photographs

Aerial Year	Site Description	Area Description	
		Direction	**Description**
1960 1963 1966 1971, 1972	The Site appears as undeveloped land.	North	Undeveloped land
		South	Residential homes
		East	Undeveloped land
		West	Residential homes
1996 2001 2003 2004 2005 2009 to 2016	The Site building appears similar to the current configuration	North	Athletic Track
		South	Residential homes
		East	School
		West	Residential homes

5.4 Radius Search for Properties of Environmental Concern

A radius search was conducted of federal and state-listed sites of potential environmental concern as outlined in ASTM E-1527 guidelines. The search was performed using software developed by Environmental Data Resources (EDR).

The Site is not listed on any of the regulatory databases. Sites identified within the designated ASTM search radii are summarized in the following table. The EDR report is included in **Appendix B.**

Table 4
Properties of Potential Environmental Concern

NPL (1 mi.)	RCRIS TSDF (1 mi.)	CERCLIS (0.5 mi.)	Landfill (0.5 mi.)	STATE SITES (0.5 mi.)	LUST & SPILLS (0.25 mile)	ERNS (Site/ Abutters	RCRIS (Site/ Abutter	UST (Site/ Abutter
NI	NI	NI	Ralph Seaver 51 Redfield St Inactive	Ekco-Glaco Inc. 110 Goddard Memorial N/0.373 mi Elev Diff=+63 2-18580/RAO Millbrook Facility 1475 Main St SE/0.428 mi Elev Diff= -140 2-10973/RAO Green Valley Oil Station 200 Main St SW/0.438 mi Elev Diff=-70 2-12496/RAO 1 additional sites	NI	NI	NI	NI

Notes:
All addresses are located in Worcester, MA
N=north, S=south, W=west, E=east
NPL = National Priorities List
RCRIS = Resource Conservation and Recovery Information System
TSDF = Treatment Storage & Disposal Facilities
ERNS = Environmental Response Notification System
NI = None Identified
NFA – LSP Opinion of No Further Action
RAO = Closed in accordance with MADEP Regulations
TierII = Listed with MADEP due to oil or hazardous material in soil/groundwater (not closed)
DPS = Downgradient Property Status (contamination is from an upgradient source)
UST = Underground Storage Tank
F = Final
AUL = Activity and Use Limitation
DEPNFA= DEP No Further Action
PENNFA=Pending No Further Action

5.5 Massachusetts Department of Environmental Protection Review

Site-specific files were not reviewed at the Massachusetts Department of Environmental Protection (MADEP) since sites identified in the EDR report have been closed out by the MADEP, the identified properties are located far enough away or topographically and/or hydraulically downgradient from the Site. The identified properties, therefore, are not suspected to pose a material threat of harm to the Site.

5.6 Previous Reports

A UST Closure report prepared by Corporate Environmental Advisors, Inc. (CEA) dated November 28, 2007 was reviewed at the Fire Prevention Office. The findings of this report are presented in section 5.1.6. No other previous reports were made available through sources cited in this assessment.

5.7 Physical Setting Sources

LAI reviewed information provided by the United States Geological Survey (USGS) in connection with physiographic conditions, soil and bedrock types. LAI also reviewed the MADEP Priority Resource Map for the area, and located natural resources during the Site Reconnaissance. According to the USGS Worcester, Massachusetts Quadrangle Topographical Map, the elevation of the Site is approximately 780 feet above mean sea level. Topography of the Site vicinity is gently sloped. The direction of groundwater flow in the vicinity is estimated to the northeast.

Bear Swamp is located approximately 460 feet to the northeast of the Site. Review of the Flood Insurance Rate Map (25027C0801E), dated July 4, 2011, published by the Federal Emergency Management Agency (FEMA) indicated the Site is located in Zone X, areas outside the 500-year flood plain with less than 0.2% annual probability of flooding.

Review of the MADEP Priority Resource Map published by the MADEP, indicated the Site is not located in a potential aquifer area. Review of the National Wetlands Inventory from the U.S fish and Wildlife Service, indicated that wetlands are located on the northern portion of the Site and on the north adjacent properties.

The Soil Survey of Worcester County indicates that soil in the vicinity of the Site is classified as Chatfield-Hollis-Rock outcrop, and is described as a well-drained, fine sandy loam with three to 15 percent slopes.

5.8 Historical Use Information

Research regarding historical land usage of the Site and surrounding properties was conducted using data obtained from historical maps, parties familiar with the Site, and municipal officials. Based on information gathered through the course of this assessment, the following history of the Site has been prepared:

- The Site was developed in 1978 as the South High Community School, a City of Worcester high school. Prior to development the Site was undeveloped land.

6.0 SITE RECONNAISSANCE

6.1 Methodology and Limiting Conditions

On November 4, 2016, LAI personnel conducted on-site inspections, which consisted of a visual examination of the Site and portions of adjacent properties and interviews with Site personnel. Areas were examined for surficial indications of releases of oil and/or hazardous materials (OHM).

Mr. Timothy Fournier, the Maintenance Supervisor for the South High Community School accompanied our personnel during the inspection. A Site Plan depicting significant features observed is included as **Figure 3** and photographs are included in **Appendix A** of this report.

6.2 Interior Inspection

The Site building has been occupied by South High Community School since 1978. The building consists of offices, classrooms, cafeterias, an auto shop and pool and has a footprint of approximately 244,486 square feet. Heat and cooling for the building is provided by approximately 20 electric air handling units located perimeter of the building. Natural gas-fired roof top HVAC units provided additional heat and cooling for the building. One 275-gallon diesel AST was observed in the maintenance area and is associated with the emergency generator. One hydraulic elevator was observed in the building. The hydraulic reservoir for the elevator equipment was observed above the concrete floors; evidence of minor leaks and staining from the equipment was observed in the elevator equipment rooms. However, the equipment is located on a concrete floor; no cracks were observed in the floors.

Two aboveground hydraulic automobile lifts were observed in the auto shop. Minor staining was observed on the concrete in the auto shop area. Based on operations in the auto shop classroom, minor staining associated with auto repairs is anticipated. Mr. Gregory Ricotti, the Head of the Auto Department reported that one underground hydraulic auto lift was removed from the auto shop in 1994. According to Mr. Ricotti, no leaking was observed from the hydraulic equipment at the time of the removal. No removal permits were available at the Fire or Building Departments.

Two flammables cabinets (containing retail-sized containers of spray paint and motor oil), one 55-gallon drum of waste oil with secondary containment and two oxygen tanks were observed in the auto shop. Minor staining was observed on the concrete in the auto shop area. Based on operations in the auto shop classroom, minor staining associated with auto repairs is anticipated.

No evidence of a significant surface release of OHM was observed through the course of our inspection. No visible evidence of significant mold was observed.

6.3 Exterior Inspection

The Site is improved with one two- and three-story building constructed on-slab. The Lot is occupied by two school buildings; Dr. Arthur Sullivan Middle School and South High Community School. South High Community School is the only building included in this assessment. The building has a footprint of approximately 244,486 square feet. The building is located on the southwest portion of the lot. Paved parking areas and driveways exist on the south, east and west sides of the Site building. Walkways and a small playground exist on the north side of the building. A solid waste compactor and recycling dumpster were observed on the south side of the building.

A track exists to the north of the Site. Dr. Arthur Sullivan Middle School exists to the east of the Site and residential properties exist to the south and west.

LAI did not observe any odors, pools of liquid, ponds, lagoons, stressed vegetation, suspicious containers or tanks, or solid waste during the reconnaissance.

7.0 INTERVIEWS

LAI interviewed the current owner representative in connection with property conditions and the potential for Recognized Environmental Conditions.

Mr. Timothy Fournier, the Maintenance Supervisor for the South High Community School accompanied our personnel during the inspection. They were interviewed and questioned of any knowledge regarding environmental conditions or releases at the Site.

8.0 SUMMARY OF FINDINGS AND CONCLUSION

8.1 Findings

Lord Associates, Inc. has completed a Phase I Environmental Site Assessment of the Site. This assessment was performed with consideration to standard industry practice and the ASTM E-1527-13 site assessment standard entitled “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”. Our findings are presented below:

1. Information provided indicates that the Site consists of one lot totaling approximately 42.6 acres of land located at the north side of Apricot Street in Worcester, Massachusetts. The Site is designated as Parcel ID 56-016-00013 with the Worcester Tax Assessor’s Department. The Site property is located in an area zoned as Residential Limited (RL-7). The building was constructed in 1978.

2. The Site is improved with one two- and three-story building constructed on-slab. The building consists of offices, classrooms, cafeterias, an auto shop and pool and has a

footprint of approximately 244,486 square feet. The building is located on the southwest portion of the lot. Paved parking areas and driveways exist on the south, east and west sides of the Site building. Walkways and a small playground exist on the north side of the building.

3. The Site was developed in 1978 as the South High Community School, a City of Worcester high school. Prior to development the Site was undeveloped land.

4. Lord Associates, Inc. conducted an inspection of the Site consisting of a visual examination of the Site, immediate surrounding features, and abutting properties. The Site is connected to the municipal sewer and water systems.

5. Heat and cooling for the building is provided by approximately 20 electric air handling units located perimeter of the building. Natural gas-fired roof top HVAC units provided additional heat and cooling for the building.

6. Municipal file reviews were performed. Fire department records indicate that one 2,400-gallon diesel UST was removed on July 10, 2007, from the west side of the building. A UST Closure report prepared by Corporate Environmental Advisors, Inc. (CEA) dated November 28, 2007 was reviewed at the Fire Prevention Office. Two small holes were observed in the tank. However, laboratory results of the confirmatory soil samples indicated that no concentrations of EPH were detected exceeding the Regulatory Standards.

7. One 275-gallon diesel AST was observed in the maintenance area and is associated with the emergency generator.

8. The Site is not listed on any of the regulatory databases. Several state-listed properties were identified in the radius search of waste sites in the vicinity. Based on the information in the database, the location, distance, regulatory status and/or cleanup activities, it is our opinion that the remaining properties listed do not represent a material threat of harm to the subject site.

8.2 Conclusions

This assessment has not identified any Recognized Environmental Conditions (RECs) in connection with the property, 170 Apricot Street in Worcester, Massachusetts.

Any exceptions to, or deletions from, ASTM Practice E1527 are described in **Section 9** of this report.

9.0 RESTRICTIVE CONDITIONS

9.1 Limitations & Deviations

LAI recognizes the following limitations and/or deviations from the Standard with respect to this Phase I Environmental Site Assessment:

- LAI did not interview past owners of the Site;
- LAI did not interview owners of neighboring property;
- LAI did not review Title Records for the Site; and
- LAI did not conduct an evaluation of the purchase price of the Site compared to the fair market value.

9.2 Significance of Data Gaps

As described above, the deviations from the Standard constitute data gaps. However, it is our opinion that these data gaps do not raise reasonable concerns that would affect the ability to identify conditions indicative of a release or threatened release or Recognized Environmental Conditions (RECs) based upon other information collected during the course of the Phase I Environmental Site Assessment.

- Although the past owner and owners of neighboring property were not interviewed, site and surrounding area history does not indicate prior use involving oil and/or hazardous materials.
- In Massachusetts, all environmental liens and Activity and Use Limitations are identified on the MADEP sites database, which has been searched.
- Based on Site History, there is no reasonable indication that property value has been affected due to environmental concerns.

10.0 LIMITATIONS

No warranty, whether expressed or implied, is given with respect to this report or any opinions expressed herein. It is expressly understood that this report and the opinions expressed herein are based upon Site conditions, as they existed only at the time of assessment. Nothing in this report constitutes a legal opinion or legal service, and should not be relied upon as such.

The data reported and the findings, observations, and opinions expressed in the report are limited by the Scope of Work. The Scope of Work was performed based on budgetary, time, and other constraints imposed by the Client, and the agencies and persons reviewed.

In preparing this report, Lord Associates, Inc. has relied upon and presumed accurate certain information about the Site and adjacent properties provided by governmental agencies, the client and others identified in the report. Except as otherwise stated in the report, Lord Associates, Inc. has not attempted to verify the accuracy or completeness of any such information.

This report has been prepared on behalf of and for the exclusive use of the client, and those immediate entities involved with the proximate financing of this project, solely for use in the environmental evaluation of the Site. Any reuse or reliance on this report by any other third party shall be done only with the written consent of LAI.

11.0 SIGNATURES AND ENVIRONMENTAL PROFESSIONAL STATEMENT

LAI declares that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. LAI has the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. LAI has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

This report is dated this November 16, 2016 and is signed by individuals who are duly authorized to do so.

Ralph J. Tella	
Ralph Tella, CHMM, LSP	Andrea J. Lang
President	Project Manager

APPENDIX J

HAZARDOUS MATERIALS IDENTIFICATION SURVEY

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FINAL REPORT
FOR
HAZARDOUS MATERIALS IDENTIFICATION
STUDY
AT THE
SOUTH HIGH COMMUNITY SCHOOL
WORCESTER, MASSACHUSETTS

PROJECT NO: 216 369.00

Survey Dates:
November 2-8, 2016

CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 Brewster Road
Framingham, MA 01702

UEC universal environmental consultants

November 15, 2016

Mr. Eric Moore
Lamoureux Pagano Associates
108 Grove Street
Worcester, MA 01605

Reference: Report for Hazardous Materials Identification Study
South High Community School, Worcester, MA

Dear Mr. Moore:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for the hazardous materials identification study at the South High Community School, Worcester, MA.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

Ammar M. Dieb
President

UEC:\216 369.00\Report.DOC

Enclosure

1.0 INTRODUCTION:

Universal Environmental Consultants (UEC) has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of twenty five years of experience.

UEC was contracted by Lamoureux Pagano Associates to conduct the following services at the South High Community School, Worcester, Massachusetts:

- Asbestos Containing Materials (ACM) determination inspection and sampling;
- Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures inspection;
- PCB's in Caulking inspection;
- Lead Based Paint (LBP) inspection;
- Mercury in Rubber Flooring inspection and sampling;
- Airborne Mold inspection and sampling;
- Radon sampling;
- Other hazardous materials inspection.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination and quantities of types of ACM found and cost estimates for remediation. A comprehensive survey per the Environmental Protection Agency (EPA) NESHAP regulation would be required prior to any renovation or demolition activities.

Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) Method in accordance with EPA standard. Bulk samples were collected by Massachusetts licensed asbestos inspectors Mr. Leonard J. Busa (AI-030673) and Mr. Jason Becotte (AI-034963) and analyzed by a Massachusetts licensed laboratory SanAir Technologies Laboratory, Powhatan, VA.

Mercury samples were analyzed by an EPA licensed laboratory, EMSL, Cinnaminson, NJ in accordance with EPA method 7471B.

Airborne mold samples were analyzed by an EPA approved laboratory EMSL, Woburn, MA.

Radon samples were analyzed by an EPA licensed laboratory AccuStar, Medway, MA.

Samples results are attached.

2.0 FINDINGS:

Asbestos Containing Materials (ACM):

The regulations for asbestos inspection are based on representative sampling. It would be impractical and costly to sample all materials in all areas. Therefore, representative samples of each homogenous area were collected and analyzed or assumed.

All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to contain asbestos based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent in accordance with EPA regulations. Per the Department of Environmental Protection (DEP) any amount of asbestos found must be disposed as asbestos.

No additional suspect or accessible ACM were found during this survey. Hidden ACM may be found during the renovation and demolition activities.

Number of Samples Collected:

Exterior:

Ten (10) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Suspect Material

1. Exterior window framing caulking
2. Exterior window framing caulking
3. Exterior window glazing caulking
4. Exterior window glazing caulking
5. Exterior door framing caulking
6. Exterior door framing caulking
7. Exterior expansion joint caulking
8. Exterior expansion joint caulking
9. Exterior unit vent grille caulking
10. Exterior unit vent grille caulking

Sample Results:

Type and Location of Suspect Material	**Sample Result**
1. Exterior window framing caulking	No Asbestos Detected
2. Exterior window framing caulking	No Asbestos Detected
3. Exterior window glazing caulking	No Asbestos Detected
4. Exterior window glazing caulking	No Asbestos Detected
5. Exterior door framing caulking	No Asbestos Detected
6. Exterior door framing caulking	No Asbestos Detected
7. Exterior expansion joint caulking	No Asbestos Detected
8. Exterior expansion joint caulking	No Asbestos Detected
9. Exterior unit vent grille caulking	No Asbestos Detected
10. Exterior unit vent grille caulking	No Asbestos Detected

Interior:

Seventy two (72) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Suspect Material

1. Soft grey interior window glazing caulking at entrance to 101/105
2. Soft grey interior glazing caulking for small window in metal door at classroom 161
3. 2’ x 2’ Suspended acoustical ceiling tile at classroom 154
4. 2’ x 2’ Suspended acoustical ceiling tile at office
5. Mastic for wood block floor at classroom 157
6. Black sink dampproofing at classroom 115
7. Black sink dampproofing at classroom 111
8. Red duct sealant at maintenance
9. Generator exhaust insulation at maintenance
10. Generator exhaust insulation at maintenance
11. Vertical caulking in CMU wall where garage meet maintenance
12. Hard joint insulation above ceiling at janitor closet
13. 1’ x 1’ Acoustical ceiling tile at first floor main hallway
14. Joint compound at classroom 115
15. Finish on gypsum ceiling at electrical closet

16. Gypsum ceiling at electrical closet
17. Insulation inside wood fire door at entrance to 135
18. Mottled brown 12” x 12” vinyl floor tile at hallway by J-10
19. Mastic for mottled brown 12” x 12” vinyl floor tile at hallway by J-10
20. Dull lime 12” x 12” vinyl floor tile at classroom 154
21. Mastic for dull lime 12” x 12” vinyl floor tile at classroom 154
22. Dull lime 12” x 12” vinyl floor tile at classroom 122
23. Mastic for dull lime 12” x 12” vinyl floor tile at classroom 122
24. Brown/black 12” x 12” vinyl floor tile at classroom 121
25. Mastic for brown/black 12” x 12” vinyl floor tile at classroom 121
26. Dark blue 12” x 12” vinyl floor tile at hallway by classroom 158
27. Mastic for dark blue 12” x 12” vinyl floor tile at hallway by classroom 158
28. Mottled grey 12” x 12” vinyl floor tile at electrical closet
29. Mastic for mottled grey 12” x 12” vinyl floor tile at electrical closet
30. Soft grey glazing caulking for interior window at entrance to 300
31. Red/orange 12” x 12” vinyl floor tile at hallway by 313
32. Mastic for red/orange 12” x 12” vinyl floor tile at hallway by 313
33. Red/orange 12” x 12” vinyl floor tile at stairwell by 349
34. Mastic for red/orange 12” x 12” vinyl floor tile at stairwell by 349
35. Gold 12” x 12” vinyl floor tile at classroom 328
36. Mastic for gold 12” x 12” vinyl floor tile at classroom 328
37. 1’ x 1’ Acoustical ceiling tile at third floor main hallway
38. 2’ x 2’ Suspended acoustical ceiling tile at classroom 324
39. Red duct sealant above ceiling at main corridor
40. Red duct sealant above ceiling at office
41. Black coating on metal duct above ceiling at main corridor
42. Black coating on metal duct above ceiling at main corridor
43. Black coating on metal duct above ceiling at main corridor
44. Rough finish on gypsum wall
45. Joint compound on gypsum wall
46. Smooth ceiling plaster at room 117
47. Smooth ceiling plaster at J-10
48. Rough ceiling plaster at auditorium
49. Rough ceiling plaster at auditorium
50. Soft grey interior glazing caulking for small window in metal door at rear of auditorium
51. Finish on CMU wall at room 117
52. Joint compound at front of stage
53. Joint compound at guidance
54. 2’ x 2’ Suspended acoustical ceiling tile at classroom 242
55. 1’ x 1’ Acoustical ceiling tile at second floor main hallway
56. Residue glue daub on CMU wall for chalkboard at classroom 242
57. Brown mastic for cove base at hallway by locker room
58. Mottled grey 12” x 12” vinyl floor tile at cafeteria
59. Mastic for mottled grey 12” x 12” vinyl floor tile at cafeteria
60. Brown 12” x 12” vinyl floor tile at teacher’s dining room
61. Mastic for brown 12” x 12” vinyl floor tile at teacher’s dining room
62. Lime green 12” x 12” vinyl floor tile at hallway by 293
63. Mastic for lime green 12” x 12” vinyl floor tile at hallway by 293
64. Gold 12” x 12” vinyl floor tile at rear corridor hall to auditorium
65. Mastic for gold 12” x 12” vinyl floor tile at rear corridor hall to auditorium
66. Paint on beam at Pool building
67. Vertical caulking in CMU at Pool building
68. Hard joint insulation above ceiling at main corridor by 122
69. Red duct sealant above ceiling at main corridor by 122
70. Slight rough finish on gypsum ceiling underside of stairwell by E-12

71. Joint compound above ceiling tile at second floor main hallway
72. Residue fireproofing above ceiling tile at second floor main hallway

Sample Results:

Type and Location of Suspect Material	**Sample Result**
1. Soft grey interior window glazing caulking at entrance to 101/105	3% Asbestos
2. Soft grey interior glazing caulking for small window in metal door at classroom 161	3% Asbestos
3. 2' x 2' Suspended acoustical ceiling tile at classroom 154	No Asbestos Detected
4. 2' x 2' Suspended acoustical ceiling tile at office	No Asbestos Detected
5. Mastic for wood block floor at classroom 157	<1% Asbestos
6. Black sink dampproofing at classroom 115	<1% Asbestos
7. Black sink dampproofing at classroom 111	<1% Asbestos
8. Red duct sealant at maintenance	No Asbestos Detected
9. Generator exhaust insulation at maintenance	No Asbestos Detected
10. Generator exhaust insulation at maintenance	No Asbestos Detected
11. Vertical caulking in CMU wall where garage meet maintenance	No Asbestos Detected
12. Hard joint insulation above ceiling at janitor closet	No Asbestos Detected
13. 1' x 1' Acoustical ceiling tile at first floor main hallway	No Asbestos Detected
14. Joint compound at classroom 115	No Asbestos Detected
15. Finish on gypsum ceiling at electrical closet	No Asbestos Detected
16. Gypsum ceiling at electrical closet	No Asbestos Detected
17. Insulation inside wood fire door at entrance to 135	5% Asbestos
18. Mottled brown 12" x 12" vinyl floor tile at hallway by J-10	No Asbestos Detected
19. Mastic for mottled brown 12" x 12" vinyl floor tile at hallway by J-10	No Asbestos Detected
20. Dull lime 12" x 12" vinyl floor tile at classroom 154	No Asbestos Detected
21. Mastic for dull lime 12" x 12" vinyl floor tile at classroom 154	<1% Asbestos
22. Dull lime 12" x 12" vinyl floor tile at classroom 122	No Asbestos Detected
23. Mastic for dull lime 12" x 12" vinyl floor tile at classroom 122	3% Asbestos
24. Brown/black 12" x 12" vinyl floor tile at classroom 121	No Asbestos Detected
25. Mastic for brown/black 12" x 12" vinyl floor tile at classroom 121	4% Asbestos
26. Dark blue 12" x 12" vinyl floor tile at hallway by classroom 158	No Asbestos Detected
27. Mastic for dark blue 12" x 12" vinyl floor tile at hallway by classroom 158	4% Asbestos
28. Mottled grey 12" x 12" vinyl floor tile at electrical closet	No Asbestos Detected
29. Mastic for mottled grey 12" x 12" vinyl floor tile at electrical closet	4% Asbestos
30. Soft grey glazing caulking for interior window at entrance to 300	2% Asbestos
31. Red/orange 12" x 12" vinyl floor tile at hallway by 313	No Asbestos Detected
32. Mastic for red/orange 12" x 12" vinyl floor tile at hallway by 313	2% Asbestos
33. Red/orange 12" x 12" vinyl floor tile at stairwell by 349	No Asbestos Detected
34. Mastic for red/orange 12" x 12" vinyl floor tile at stairwell by 349	5% Asbestos
35. Gold 12" x 12" vinyl floor tile at classroom 328	No Asbestos Detected
36. Mastic for gold 12" x 12" vinyl floor tile at classroom 328	3% Asbestos
37. 1' x 1' Acoustical ceiling tile at third floor main hallway	No Asbestos Detected
38. 2' x 2' Suspended acoustical ceiling tile at classroom 324	No Asbestos Detected
39. Red duct sealant above ceiling at main corridor	2% Asbestos
40. Red duct sealant above ceiling at office	No Asbestos Detected
41. Black coating on metal duct above ceiling at main corridor	No Asbestos Detected
42. Black coating on metal duct above ceiling at main corridor	No Asbestos Detected
43. Black coating on metal duct above ceiling at main corridor	No Asbestos Detected
44. Rough finish on gypsum wall	No Asbestos Detected
45. Joint compound on gypsum wall	No Asbestos Detected
46. Smooth ceiling plaster at room 117	No Asbestos Detected
47. Smooth ceiling plaster at J-10	No Asbestos Detected
48. Rough ceiling plaster at auditorium	No Asbestos Detected

49. Rough ceiling plaster at auditorium	No Asbestos Detected
50. Soft grey interior glazing caulking for small window in metal door at rear of auditorium	5% Asbestos
51. Finish on CMU wall at room 117	No Asbestos Detected
52. Joint compound at front of stage	No Asbestos Detected
53. Joint compound at guidance	No Asbestos Detected
54. 2’ x 2’ Suspended acoustical ceiling tile at classroom 242	No Asbestos Detected
55. 1’ x 1’ Acoustical ceiling tile at second floor main hallway	No Asbestos Detected
56. Residue glue daub on CMU wall for chalkboard at classroom 242	<1% Asbestos
57. Brown mastic for cove base at hallway by locker room	No Asbestos Detected
58. Mottled grey 12” x 12” vinyl floor tile at cafeteria	No Asbestos Detected
59. Mastic for mottled grey 12” x 12” vinyl floor tile at cafeteria	2% Asbestos
60. Brown 12” x 12” vinyl floor tile at teacher’s dining room	2% Asbestos
61. Mastic for brown 12” x 12” vinyl floor tile at teacher’s dining room	2% Asbestos
62. Lime green 12” x 12” vinyl floor tile at hallway by 293	No Asbestos Detected
63. Mastic for lime green 12” x 12” vinyl floor tile at hallway by 293	4% Asbestos
64. Gold 12” x 12” vinyl floor tile at rear corridor hall to auditorium	No Asbestos Detected
65. Mastic for gold 12” x 12” vinyl floor tile at rear corridor hall to auditorium	No Asbestos Detected
66. Paint on beam at Pool building	No Asbestos Detected
67. Vertical caulking in CMU at Pool building	No Asbestos Detected
68. Hard joint insulation above ceiling at main corridor by 122	No Asbestos Detected
69. Red duct sealant above ceiling at main corridor by 122	2% Asbestos
70. Slight rough finish on gypsum ceiling underside of stairwell by E-12	No Asbestos Detected
71. Joint compound above ceiling tile at second floor main hallway	No Asbestos Detected
72. Residue fireproofing above ceiling tile at second floor main hallway	No Asbestos Detected

Observations and Conclusions:

The condition of ACM is very important. ACM in good condition does not present a health issue unless it is disturbed. Therefore, it is not necessary to remediate ACM in good condition unless it will be disturbed through renovation, demolition or other activity.

Refer to the AHERA Management Plan for condition of ACM.

1. Soft grey interior window glazing caulking was found to contain asbestos.
2. Soft grey interior glazing caulking for small window in metal door was found to contain asbestos.
3. Mastic for wood block floor was found to contain <1% asbestos. Per DEP regulations the waste must be treated as asbestos.
4. Black sink damproofing was found to contain <1% asbestos. Per DEP regulations the waste must be treated as asbestos.
5. Soft grey glazing caulking for interior window was found to contain asbestos.
6. Red duct sealant was found to contain asbestos.
7. Residue glue daub on CMU wall for chalkboard was found to contain <1% asbestos. Per DEP regulations the waste must be treated as asbestos.
8. Mastic for various types of vinyl floor tile was found to contain asbestos.
9. Fireproofing was assumed to contain asbestos. The ACM is too high to access.
10. Stage fire curtain was assumed to contain asbestos.
11. Transite tables were observed and were assumed to contain asbestos.
12. Glue holding old blackboard was assumed to contain asbestos.
13. Exterior damproofing on foundation/exterior walls was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.
14. Roofing was removed 2004.
15. Underground sewer pipes were assumed to contain asbestos.
16. All other suspect materials were found not to contain asbestos. Hidden ACM may be found during renovation and demolition activities.

Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures:
Observations and Conclusions
Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's since there were labels indicating that "No PCB's" was found. Tubes in light fixtures, thermostats, signs and switches were assumed to contain mercury. It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above equipments should be disposed in an EPA approved landfill as part of the demolition project.

PCB's in Caulking Material:
Observations and Conclusions
Building caulking was assumed to contain PCB's. PCB's are manmade chemicals that were widely produced and distributed across the country from the 1950s to 1977 until the production of PCB's was banned by the US Environmental Protection Agency (EPA) law which became effective in 1978. PCB's are a class of chemicals made up of more than 200 different compounds. PCB's are non-flammable, stable, and good insulators so they were widely used in a variety of products including: electrical transformers and capacitors, cable and wire coverings, sealants and caulking, and household products such as television sets and fluorescent light fixtures. Because of their chemical properties, PCB's are not very soluble in water and they do not break down easily in the environment. PCB's also do not readily evaporate into air but tend to remain as solids or thick liquids. Even though PCB's have not been produced or used in the country for more than 30 years, they are still present in the environment in the air, soil, and water and in our food. EPA requires that all construction waste including caulking be disposed as PCB's if PCB's level exceed 50 mg/kg (ppm). An abatement plan might also be required.

Lead Based Paint (LBP):
Observations and Conclusions
A school is not considered a regulated facility. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations. According to OSHA, any amount of LBP triggers compliance.

Mercury in Rubber Flooring:

Number of Samples Collected
Four (4) bulk samples were collected from the following.

Type and Location of Material

1. Rubber flooring at gymnasium
2. Rubber flooring at gymnasium
3. Rubber flooring at Room 292
4. Rubber flooring at Room 293

Sample Results

Type and Location of Material	**Sample Result**
1. Rubber flooring at gymnasium	180 mg/kg
2. Rubber flooring at gymnasium	51 mg/kg
3. Rubber flooring at Room 292	120 mg/kg
4. Rubber flooring at Room 293	82 mg/kg

Observations and Conclusions:
Samples results indicated the presence of high level of mercury. Mercury was assumed to have leached into the concrete slab. Sampling would be required to determine extent of contamination/leaching.

Airborne Mold:
Airborne mold testing was performed utilizing Zefon International Incorporated's Air-O-Cell® sampling device following all manufacturer supplied recommended sampling procedures. Air-O-Cell® is a direct read total particulate air sampling device. It works using the inertial impaction principle similar to other spore trap devices. It is designed for the rapid collection and analysis of airborne particulate including bioaerosols. The particulate includes fibers (e.g. asbestos, fiberglass, cellulose, clothing fibers) opaque particles (e.g. fly ash, combustion particles, copy toner, oil droplets, paint), and bioaerosols (e.g. mold spores, pollen, insect parts, skin cell fragments).[1]

The method involves drawing a known quantity of air through a sterile sampling cassette. Subsequent to sampling, the cassette is sealed and transferred to a microbiology laboratory under chain of custody protocol for microscopic analysis. This method counts both viable and nonviable mold spores.

The outside sample was collected by rear entrance to the school.

AIRBORNE MOLD and PARTICULATE

Lab ID #	Location	Total Mold Counts/M^3	Pollen	Insect Fragment	Hyphal Fragments
131605426-0001	Room 327	234	ND	ND	ND
131605426-0002	Room 338	660	ND	40	ND
131605426-0003	Room 356	350	ND	ND	ND
131605426-0004	Room 303	330	ND	ND	ND
131605426-0005	Room 308	120	ND	ND	40
131605426-0006	Room 212 Guidance	610	ND	ND	ND
131605426-0007	Main Office	200	ND	ND	ND
131605426-0008	Room 246	220	ND	7	ND
131605426-0009	Library	60	ND	ND	ND
131605426-0010	Room 233	577	ND	ND	ND
131605426-0011	Room 102	220	ND	ND	ND
131605426-0012	Room 122	107	ND	ND	ND
131605426-0013	Room 115	27	ND	ND	ND
131605426-0014	Room 154	720	ND	ND	ND
131605426-0015	Room 158	80	ND	ND	ND
131605426-0016	Gymnasium	1,180	ND	ND	ND
131605426-0017	Room 266 Music	187	ND	ND	ND
131605426-0018	Auditorium	1,000	ND	ND	ND
131605426-0019	Cafeteria	350	ND	ND	ND
131605426-0020	Outside	14,370	ND	ND	ND

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[1] Zefon International Inc. <www.zefon.com>

AIRBORNE MOLD and PARTICULATE
(Subjective Scales)

Lab ID #	Location	Skin Fragment Density (SFD)	Fibrous Particulates (FP)	Total Background Particulate (TBP)
131605426-0001	Room 327	2	1	1
131605426-0002	Room 338	2	1	1
131605426-0003	Room 356	2	1	1
131605426-0004	Room 303	2	1	1
131605426-0005	Room 308	2	1	1
131605426-0006	Room 212 Guidance	2	1	1
131605426-0007	Main Office	2	1	1
131605426-0008	Room 246	2	1	2
131605426-0009	Library	2	1	1
131605426-0010	Room 233	2	1	2
131605426-0011	Room 102	2	1	1
131605426-0012	Room 122	2	2	1
131605426-0013	Room 115	1	1	1
131605426-0014	Room 154	2	1	1
131605426-0015	Room 158	1	1	1
131605426-0016	Gymnasium	2	1	2
131605426-0017	Room 266 Music	2	1	3
131605426-0018	Auditorium	1	1	1
131605426-0019	Cafeteria	2	1	1
131605426-0020	Outside	1	1	1

Legend:
ND - Not Detected

Observations and Conclusions:
There are currently no guidelines or standards promulgated by a government agency or widely recognized scientific organizations for the interpretation of airborne mold spore levels. The most commonly employed tool used to assess if mold growth is occurring and there is amplification in a structure is to evaluate the indoor levels and species as well as to compare levels and species of mold outdoors to indoors. Typically, if there were more molds indoors, and/or if species were present indoors which were not present outdoors, then growth and amplification is likely occurring and further evaluation and perhaps remediation is recommended.

Based on comparisons with historical data from projects of similar type, building utilization, geographic location and season, the indoor airborne levels are considered very low. Indoor mold spore counts in late full are typically in the 2,500-5,000-spores/cubic meter range.

Breathing zone indoor and also outdoor samples indicated the presence of large quantities of several common types of mold which are not considered to be hazardous. Pollen, insect fragments and Hyphal fragments were either not present or low in the samples. Hyphal fragment is a non-reproductive part of the mold.

Total background particulate on all samples was assessed as “1-2” on a scale of 1-5 where 1 is low and 5 is high. Skin fragment density on all samples was assessed as “1-2” on a scale of 1-4 where 1 is low and 4 is high. The total background levels are measured to determine airborne dust not related to airborne mold. Skin fragments are measured to determine proper housing cleaning.

No visible mold growth was found during the survey.

Radon:

Number of Samples Collected
Twenty (20) air samples were collected at the following locations:

Location of Material

1. First floor Classroom 161
2. First floor Classroom 114
3. First floor Classroom 121
4. First floor Classroom 122
5. First floor Classroom outside 152 entrance
6. First floor Classroom 101
7. First floor Classroom 105
8. First floor Classroom 158
9. First floor Classroom 157
10. First floor Classroom 155
11. First floor Classroom 151 office
12. First floor Custodian closet J11
13. First floor Storage room G11
14. First floor Hallway by room 163
15. First floor Room 117 lounge
16. First floor Custodian closet J10
17. First floor Office by room 161
18. First floor E12
19. First floor Classroom 115
20. First floor Classroom 114

Location of Material	**Sample Result**
1. First floor Classroom 161	4.1 pCi/L
2. First floor Classroom 114	0.6 pCi/L
3. First floor Classroom 121	1.0 pCi/L
4. First floor Classroom 122	0.9 pCi/L
5. First floor Classroom outside 152 entrance	0.9 pCi/L
6. First floor Classroom 101	<0.4 pCi/L
7. First floor Classroom 105	<0.4 pCi/L
8. First floor Classroom 158	1.1 pCi/L
9. First floor Classroom 157	0.8 pCi/L
10. First floor Classroom 155	0.8 pCi/L
11. First floor Classroom 151 office	6.5 pCi/L
12. First floor Custodian closet J11	0.5 pCi/L
13. First floor Storage room G11	0.5 pCi/L
14. First floor Hallway by room 163	0.9 pCi/L
15. First floor Room 117 lounge	0.4 pCi/L
16. First floor Custodian closet J10	1.1 pCi/L
17. First floor Office by room 161	1.2 pCi/L
18. First floor E12	2.5 pCi/L

19. First floor Classroom 115	0.6 pCi/L
20. First floor Classroom 114	0.4 pCi/L

Observations and Conclusions:

The measured radon concentrations at most areas were found to be much lower than the EPA guideline of 4.0-pCi/L, with the exception of the samples collected at Classroom 161 (4.1 pCi/L) and Classroom 151 office (6.9 pCi/L) where radon concentrations were found to be higher than EPA limit. It is recommended that a ninety (90) day testing be performed or a radon mitigation system be installed at each corner of the school.

No further action is required at other areas.

3.0 COST ESTIMATES:

The cost includes removal and disposal of all accessible ACM, other hazardous material and an allowance for removal of inaccessible or hidden ACM that may be found during renovation or demolition project

Location	Material	Approximate Quantity	Cost Estimate ($)
Throughout	Various Types of Flooring and Mastic	105,000 SF	367,500.00
	Interior Windows	180 Total	36,000.00
	Interior Doors with Windows	150 Total	30,000.00
	Wood Fire Doors	25 Total	5,000.00
	Blackboards/Tackboards	150 Total	30,000.00
	Sinks	25 Total	5,000.00
	Miscellaneous Hazardous Materials	Unknown	75,000.00
	Hidden ACM	Unknown	25,000.00
	Light Fixtures	Unknown	50,000.00
Stage	Fire Curtain	1 Total	7,500.00
	Paper under Hardwood Floor	1,800 SF	18,000.00
Classroom 157	Paper/Mastic for Wood Block Floor	1,200 SF	12,000.00
Science Room	Lab Tables	2 Total	2,500.00
Hallways	Fireproofing	10,000 SF	90,000.00
Gymnasium	Rubber Flooring/Cement	19,000 SF	190,000.00
Rooms 292/293	Rubber Flooring/Cement	1,200 SF	18,000.00
Exterior	Transite Sewer Pipes	Unknown[1]	75,000.00
	Dampproofing/Flashing on Walls	3,500 Tons[1]	490,000.00
PCB's Remediation[2]			70,000.00
Estimated costs for PCB's Testing and Abatement Plans Services[2]			25,000.00
Estimated costs for NESHAP Inspection and Testing Services			17,500.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			180,000.00
		TOTAL:	**$ 1,820,000.00**

[1]: Part of total demolition.

[2]: Should results exceed EPA limit.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

Asbestos:
Asbestos samples were collected using a method that prevents fiber release. Homogeneous sample areas were determined by criteria outlined in EPA document 560/5-85-030a. Bulk material samples were analyzed using PLM and dispersion staining techniques with EPA method 600/M4-82-020.

Mercury in Rubber Flooring:
The bulk sample was analyzed in accordance with EPA method 7471B.

Airborne Mold:
The samples were analyzed by an EPA approved laboratory EMSL, Woburn, MA.

Radon:
Radon samples were analyzed by an EPA licensed laboratory AccuStar, Medway, MA.

Inspection by:

Jason Becotte

Jason Becotte
Asbestos Inspector

Inspected By:

Leonard Busa

Leonard J. Busa
Asbestos Inspector

5.0 LIMITATIONS AND CONDITIONS:

This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

Asbestos Identification Laboratory

165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600
Web: www.asbestosidentificationlab.com
Email: mikemanning@asbestosidentificationlab.com

Batch: 17442

Lab Code: 200919-0

November 08, 2016

Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Project Number:
Project Name: South High, Worcester, MA

Date Sampled: 2016-11-03
Work Received: 2016-11-04
Work Analyzed: 2016-11-08

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

Dear Ammar Dieb,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project .

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Ammar Dieb for your business.

Michael Manning

Michael Manning
Owner/Director

November 08, 2016

Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Project Number:
Project Name: South High, Worcester, MA

Date Sampled: 2016-11-03
Work Received: 2016-11-04
Work Analyzed: 2016-11-08

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1	192854	Window Caulk	Exterior Frame	brown	Non-Fibrous 100	None Detected
2	192855	Window Caulk	Exterior Frame	brown	Non-Fibrous 100	None Detected
3	192856	Window Glass Glaze	Exterior Window	black	Non-Fibrous 100	None Detected
4	192857	Window Glass Glaze	Exterior Window	black	Non-Fibrous 100	None Detected
5	192858	Door Frame Caulk	Exterior Door	brown	Non-Fibrous 100	None Detected
6	192859	Door Frame Caulk	Exterior Door	brown	Non-Fibrous 100	None Detected
7	192860	Expansion Joint Caulk	Exterior Joints	multi	Non-Fibrous 100	None Detected
8	192861	Expansion Joint Caulk	Exterior Joints	multi	Non-Fibrous 100	None Detected
9	192862	Vent Caulk	Exterior Vents	brown	Non-Fibrous 100	None Detected
10	192863	Vent Caulk	Exterior Vents	brown	Non-Fibrous 100	None Detected

Tuesday 08

Analyzed by:

End of Report

Batch: 17442

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM
48-hour TAT

Town/City: Worcester, MA Building Name South High

Sample	Result	Description of Material	Sample Location
1		window caulk	exterior frame
2		| |	| |
3		window glass glaze	exterior window
4		| |	| |
5		Door Frame Caulk	exterior Door
6		| |	| |
7		expansion Joint Caulk	exterior Joints
8		| |	| |
9		vent caulk	exterior vents
10		| |	| |

Reported By: Jason Becotte Date: 11-3-16 Due Date:

Received By: Date: 11/4/16

Mike Manning
Asbestos Identification Lab
165 New Boston Street, Ste 227
Woburn, MA 01801
781-932-9600
www.AsbestosIdentificationLab.com

NVLAP
Lab Code: 200919-0

Dear Ammar Dieb,

Enclosed please find 116 samples tested for **PLM** from project: **South High Community School, Worcester, MA.** Asbestos Identification Laboratory subcontracted the samples to be analyzed by a NVLAP accredited laboratory.

Thank you

Michael Manning

Asbestos Identification Laboratory

November 10th, 2016

SanAir Technologies Laboratory

Analysis Report

prepared for

Asbestos Identification Laboratory

Report Date: 11/10/2016
Project Name: South High Community School Worcester MA
SanAir ID#: 16040780

NVLAP LAB CODE 200870-0

Virginia SBE
Certification # 652931

Texas Licensed Mold Analysis Laboratory
License # LAB0166

SanAir Technologies Laboratory

804.897.1177 www.sanair.com

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

Asbestos Identification Laboratory
165U New Boston St
Suite 227
Woburn, MA 01801

November 10, 2016

SanAir ID # 16040780
Project Name: South High Community School Worcester MA
Project Number:

Dear Michael Manning,

We at SanAir would like to thank you for the work you recently submitted. The 72 sample(s) were received on Wednesday, November 09, 2016 via FedEx. The final report(s) is enclosed for the following sample(s): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
2 sample(s) in Discrepancy w/ COC condition 70 sample(s) in Good condition

Name: Asbestos Identification Laboratory
Address: 165U New Boston St
Suite 227
Woburn, MA 01801

Project Number:
P.O. Number:
Project Name: South High Community School Worcester MA

Collected Date: 11/4/2016
Received Date: 11/9/2016 10:55:00 AM
Report Date: 11/10/2016 3:19:42 PM
Analyst: Rutter, Amber
Tallert, Jonathan
Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-Fibrous	
1 / 16040780-001 Interior Window Gl Entrance To 101/ 105	Various Non-Fibrous Heterogeneous	40% Cellulose	57% Other	3% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-Fibrous	
2 / 16040780-002 Gl For Small Window In Metal Door Crm 161	Various Non-Fibrous Heterogeneous	40% Cellulose	57% Other	3% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-Fibrous	
3 / 16040780-003 2x2 SAT-I Crm 154	White Fibrous Heterogeneous	45% Cellulose 35% Glass 10% Min. Wool	10% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-Fibrous	
4 / 16040780-004 SAT-I Office By Cust. Breakroom	White Fibrous Heterogeneous	45% Cellulose 35% Glass 10% Min. Wool	10% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-Fibrous	
5 / 16040780-005 Mastic For Wood Block Floor Crm 157	Black Non-Fibrous Heterogeneous		100% Other	< 1% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-Fibrous	
6 / 16040780-006 DP For Sink Crm 115	Black Non-Fibrous Heterogeneous		100% Other	< 1% Chrysotile

Certification

Analyst: Nathan Vaughan
Analysis Date: 11/10/2016

Approved Signatory:
Date: 11/10/2016

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Woburn, MA 01801

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
7 / 16040780-007 DP For Sink Crm 111	Black Non-Fibrous Heterogeneous		100% Other	< 1% Chrysotile

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
8 / 16040780-008 Duct Sealant Maintenance	Brown Non-Fibrous Heterogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
9 / 16040780-009 Generator Exhaust @ Muffler End Plate	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
10 / 16040780-010 Generator Exhaust @ Horiz	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
11 / 16040780-011 Vertical Caulk In CMU Where Garage Meets Maintenance	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
12 / 16040780-012 Non-Susp. E Off FG AC @ Jan Closet - V-11	White Fibrous Heterogeneous	55% Cellulose 30% Glass 10% Min. Wool	5% Other	None Detected

Certification

Analyst: Nathan Vaughn

Analysis Date: 11/10/2016

Approved Signatory:

Date: 11/10/2016

Name: Asbestos Identification Laboratory
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Tallert, Jonathan
Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	 % Non-Fibrous	Asbestos Fibers
13 / 16040780-013 (1x1) AT-1 1st Fl Main Hall Along 165	White Fibrous Heterogeneous	55% Cellulose 30% Glass 10% Min. Wool	5% Other	None Detected
14 / 16040780-014 Joint Compound (JC) Crm 115	White Non-Fibrous Heterogeneous		100% Other	None Detected
15 / 16040780-015 Finish On Gyp Cly (Elect. Closet) E-10	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
16 / 16040780-016 Gyp Cly #15 (Elect. Closet) E-10	White Non-Fibrous Heterogeneous		100% Other	None Detected
17 / 16040780-017 Wood Fire Door - II (W/ Steel Fr. Window) Entrance To 135	White Non-Fibrous Heterogeneous		95% Other	5% Amosite
18 / 16040780-018 VT-I (18") Hall C J-10	Brown Non-Fibrous Heterogeneous		100% Other	None Detected

Certification

Analyst:

Analysis Date: 11/10/2016

Approved Signatory:

Date: 11/10/2016

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Tallert, Jonathan
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Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
19 / 16040780-019 Mastic #18 Hall C J-10	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
20 / 16040780-020 VT-II (Dull Lino) Crm 154	White Non-Fibrous Heterogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
21 / 16040780-021 Mastic #20 Crm 154	Black Non-Fibrous Heterogeneous		100% Other	< 1% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
22 / 16040780-022 VT-II Crm 122	White Non-Fibrous Heterogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
23 / 16040780-023 Mastic #22 Crm 122	Black Non-Fibrous Heterogeneous		97% Other	3% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
24 / 16040780-024 VT-III 12" Crm 121	Brown Non-Fibrous Heterogeneous		100% Other	None Detected

Certification

Analyst: Nathan Vaughn
Analysis Date: 11/10/2016

Approved Signatory:
Date: 11/10/2016

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Tallert, Jonathan
Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
25 / 16040780-025 Mastic #24 Crm 121	Black Non-Fibrous Heterogeneous		96% Other	4% Chrysotile
26 / 16040780-026 VT-IV 12" Hall By 158	Blue Non-Fibrous Heterogeneous		100% Other	None Detected
27 / 16040780-027 Mastic #26 Hall By 158	Black Non-Fibrous Heterogeneous		96% Other	4% Chrysotile
28 / 16040780-028 VT-V (12") Elect. Closet E-10	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
29 / 16040780-029 Mastic #28 Elect. Closet E-10	Black Non-Fibrous Heterogeneous		96% Other	4% Chrysotile
30 / 16040780-030 Win Gl For Int. Win Entrance To 310	Grey Non-Fibrous Heterogeneous		98% Other	2% Chrysotile

Certification

Analyst: Nathan O Vaughn
Analysis Date: 11/10/2016

Approved Signatory:
Date: 11/10/2016

Name: Asbestos Identification Laboratory
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Suite 227
Woburn, MA 01801

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Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
31 / 16040780-031 VT-VII Hall By 313	Orange Non-Fibrous Heterogeneous		100% Other	None Detected
32 / 16040780-032 Mastic #31 Hall By 313	Black Non-Fibrous Heterogeneous		98% Other	2% Chrysotile
33 / 16040780-033 VT VII S.W By 349	Red Non-Fibrous Homogeneous		100% Other	None Detected
34 / 16040780-034 Mastic #33 S.W By 349	Black Non-Fibrous Homogeneous		95% Other	5% Chrysotile
35 / 16040780-035 VT-IX Crm 328	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
36 / 16040780-036 Mastic #35 Crm 328	Black Non-Fibrous Homogeneous		97% Other	3% Chrysotile

Certification

Analyst: Nathan Vaughan

Analysis Date: 11/10/2016

Approved Signatory:

Date: 11/10/2016

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Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
37 / 16040780-037 AT-I 3rd Fl Main Hall	White Fibrous Homogeneous	30% Cellulose 50% Min. Wool	20% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
38 / 16040780-038 SAT-I Crm 324	White Fibrous Homogeneous	40% Cellulose 40% Min. Wool	20% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
39 / 16040780-039 Duct Sealant AC, MC By 351	Red Non-Fibrous Homogeneous		98% Other	2% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
40 / 16040780-040 Duct Sealant AC, Office By Cust. Breakroom	Red Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
41 / 16040780-041 Coating On Metal Duct AC, MC By 328	Black Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
42 / 16040780-042 Coating On Metal Duct AC, MC By J-31	Black Non-Fibrous Homogeneous		100% Other	None Detected

Certification

Analyst: Nathan Vaugh

Analysis Date: 11/10/2016

Approved Signatory:

Date: 11/10/2016

Name: Asbestos Identification Laboratory
Address: 165U New Boston St
Suite 227
Woburn, MA 01801

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Report Date: 11/10/2016 3:19:42 PM
Analyst: Rutter, Amber
Tallert, Jonathan
Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	% Fibrous	% Non-Fibrous	Asbestos Fibers
43 / 16040780-043 Coating On Metal Duct AC, MC By 351	Black Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	% Fibrous	% Non-Fibrous	Asbestos Fibers
44 / 16040780-044 Finish On Gyp Wall @ Bottom Edge Of Wall Underside Of Stairs	White Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	% Fibrous	% Non-Fibrous	Asbestos Fibers
45 / 16040780-045 #44 Up To 2nd Fl By Cust Breakrm, Plaster	Grey Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	% Fibrous	% Non-Fibrous	Asbestos Fibers
46 / 16040780-046 Ceiling Plaster (CP) Rm 117	Off-White Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	% Fibrous	% Non-Fibrous	Asbestos Fibers
47 / 16040780-047 CP J-10	Off-White Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	% Fibrous	% Non-Fibrous	Asbestos Fibers
48 / 16040780-048 CP AOD, From Rear	White Non-Fibrous Homogeneous		100% Other	None Detected

Components header spans % Fibrous and % Non-Fibrous in each table.

Certification

Analyst: Nathan Vaughan
Analysis Date: 11/10/2016

Approved Signatory:
Date: 11/10/2016

Name: Asbestos Identification Laboratory
Address: 165U New Boston St
Suite 227
Woburn, MA 01801

Project Number:
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Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
49 / 16040780-049 CP AOD, From Rear	White Non-Fibrous Homogeneous		100% Other	None Detected
50 / 16040780-050 Gl For Small Win. In Metal Door, Rear Of AUD. Entrance Door	Grey Non-Fibrous Homogeneous		95% Other	5% Chrysotile
51 / 16040780-051 Painted Finish On CMU Wall Rm 117	White Non-Fibrous Homogeneous		100% Other	None Detected
52 / 16040780-052 JC Front Of Stage (Aud.)	White Non-Fibrous Homogeneous		100% Other	None Detected
53 / 16040780-053 Guidance, Skim Coat	White Non-Fibrous Homogeneous		100% Other	None Detected
54 / 16040780-054 SAT-I Crm 242	White Fibrous Homogeneous	40% Cellulose 40% Min. Wool	20% Other	None Detected

Certification

Analyst: Nathan Vaughan
Analysis Date: 11/10/2016

Approved Signatory:
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Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
55 / 16040780-055 AT-I 2nd Fl Main Hall	White Fibrous Homogeneous	40% Cellulose 40% Min. Wool	20% Other	None Detected
56 / 16040780-056 Residue Glue Daub On CMU Wall, Assumed For Pre-Exist	Brown Non-Fibrous Homogeneous		100% Other	< 1% Chrysotile
57 / 16040780-057 Mastic For Cove Base Hall Along Boy's Lockers	Brown Non-Fibrous Homogeneous		100% Other	None Detected
58 / 16040780-058 VT-V Cafe	Off-White Non-Fibrous Homogeneous		100% Other	None Detected
59 / 16040780-059 Mastic #58 Cafe	Black Non-Fibrous Homogeneous		98% Other	2% Chrysotile
60 / 16040780-060 VT-XI Teachers Dining (Rm 383)	Tan Non-Fibrous Homogeneous		98% Other	2% Chrysotile

Certification

Analyst: Nathan Vaughan
Analysis Date: 11/10/2016

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Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
61 / 16040780-061 Mastic #60 Rm 283	Black Non-Fibrous Homogeneous		98% Other	2% Chrysotile

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
62 / 16040780-062 VT-X Hall By 293	Green Non-Fibrous Heterogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
63 / 16040780-063 Mastic #62 Hall By 293	Black Non-Fibrous Heterogeneous		96% Other	4% Chrysotile

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
64 / 16040780-064 VT-IX Rear Corridor Hall To Aud.	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
65 / 16040780-065 Mastic #64 Rear Corridor Hall To Aud.	Black Non-Fibrous Heterogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
66 / 16040780-066 Paint On Beam Pool Bldg	White Non-Fibrous Heterogeneous		100% Other	None Detected

Certification

Analyst: Nathan Vaughan
Analysis Date: 11/10/2016

Approved Signatory:
Date: 11/10/2016

Name: Asbestos Identification Laboratory
Address: 165U New Boston St
Suite 227
Woburn, MA 01801

Project Number:
P.O. Number:
Project Name: South High Community School Worcester MA

Collected Date: 11/4/2016
Received Date: 11/9/2016 10:55:00 AM
Report Date: 11/10/2016 3:19:42 PM
Analyst: Rutter, Amber
Tallert, Jonathan
Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
67 / 16040780-067 Vert. Caulk In CMU Pool Bldg	Grey Non-Fibrous Heterogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
68 / 16040780-068 E Off FG AC By 122	Grey Non-Fibrous Heterogeneous	5% Glass 10% Min. Wool	85% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
69 / 16040780-069 Duct Sealant AC By 122	Red Non-Fibrous Homogeneous		98% Other	2% Chrysotile

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
70 / 16040780-070 Finish On Gyp Clg, Underside Of SW By E-12	White Non-Fibrous Homogeneous	< 1% Cellulose < 1% Glass	100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
71 / 16040780-071 JC Main Hall @ 2nd Fl, Above AT-1	White Non-Fibrous Homogeneous		100% Other	None Detected

	Stereoscopic	Components		Asbestos
SanAir ID / Description	Appearance	% Fibrous	% Non-Fibrous	Fibers
72 / 16040780-072 Residue Fireproofing Main Hall @ 2nd Fl, Above AT-1	Various Non-Fibrous Heterogeneous	3% Cellulose 3% Glass	94% Other	None Detected

Certification

Analyst:
Analysis Date: 11/10/2016

Approved Signatory:
Date: 11/10/2016

Disclaimer

The final report cannot be reproduced, except in full, without written authorization from SanAir. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample and information provided by the client. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government.

For NY state samples, method EPA 600/M4-82-020 is performed.

Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

NY ELAP lab ID 11983

SanAir
Technologies Laboratory

1551 Oakbridge Drive Suite B
Powhatan, VA 23139
804-897-1177 / 888-895-1177
Fax 804-897-0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number: 16040780

Asbestos Identification Laboratory
165 New Boston Street, Suite 227
Woburn, MA 01801

Project #:
Project Name: South High Community School Worcester MA
Date Collected: 11/4/16
P.O. Number:
Collected by:
Phone #:
Fax #:
Email:

Bulk

ABB	PLM EPA 600/R-93/116	☒
	Positive Stop ☐	
ABEPA	PLM EPA 400 Point Count	☐
ABB1K	PLM EPA 1000 Point Count	☐
ABBEN	PLM EPA NOB	☐
ABBCH	TEM Chatfield	☐
ABBTM	TEM EPA NOB	☐

Air

ABA	PCM NIOSH 7400	☐
ABA-2	OSHA w/ TWA*	☐
ABTEM	TEM AHERA	☐
ABATN	TEM NIOSH 7402	☐
ABT2	TEM Level II	☐

Soil/Vermiculite

ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
ABSP	PLM CARB 435 (LOD <1%)	☐
ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABSP2	PLM CARB 435 (LOD 0.1%)	☐

Dust

ABWA	TEM Wipe ASTM D-6480	☐
ABDMV	TEM Microvac ASTM D-5755	☐

New York ELAP

PLM NY	PLM EPA 600/M4-82-020	☐
ABEPA2	NY ELAP 198.1	☐
ABENY	NY ELAP 198.6 PLM NOB	☐
ABBNY	NY ELAP 198.4 TEM NOB	☐

Water

ABHE	EPA 100.2	☐

Other

Matrix		
		☐

Turn Around Times				
	3 HR (4 HR TEM) ☐	6 HR (8HR TEM) ☐	12 HR ☐	24 HR ☒
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Special Instructions

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start – Stop	
1-72						

Analyze only layers on COC

72 total samples

Relinquished by	Date	Time	Received by	Date	Time
	11/8/16			NOV 09 2016	10:55AM

Unless scheduled, the turn around time for all samples received after 3 pm EST Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time.
Work with standard turn around time sent Priority Overnight and Billed to Recipient will be charged a $10 shipping fee.

Page ___of ____

104

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

Town/City: Worcester, ma Building Name South High Community School

Sample	Result	Description of Material	Sample Location
1		soft grey interior window gl	entrance to 101/105
2		soft grey gl for small window	in metal door @rm 161
3		2x2 (suspect) SAT-I	@rm 154
4		SAT-I	office by cust. Breakroom
5		mastic for wood Block floor	@rm 157
6		Black cp for sink	@rm 115
7		Black cp for sink	@rm 111
8		red duct sealant	maintenance
9		Generator exhaust	@ muffler end plate
10		Generator exhaust	@ horiz
11		verticle tan caulk in cmu	where garage meets maintenance
12		non-susp Ⓔ off FG	AC @ Jan closet - J-11
13		(1x1) AT-1	1st FL main hall along 163
14		Joint Compound (JC)	@rm 115
15		~~rough~~ swirl finish on gyp clg	(elect. closet) E-10
16		gyp clg #15	" " "
17		wood fire door-II (w/ steel fr. window)	entrance to 135 areas
18		VT-I (12" mottled brown)	hall @ J-10
19		mastic #18	" "
20		VT-II (dull lime)	@rm 154

Reported By: Leonard R Busa Date: 11/4/16 Due Date: 48-hr

Received By: Date: 11/8/16

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

Town/City: Worcester, MA Building Name South High Community School

Sample	Result	Description of Material	Sample Location
21		mastic #20	clrm 154
22		VT-II	clrm 122
23		mastic #22	clrm 122
24		VT-III 12"(Brown-Black)	clrm 121
25		mastic #24	clrm 121
26		VT-IV 12"(DK Blue)	hall by 158
27		mastic #26	" "
28		VT-V (12" mottled grey)	elect. closet E-10
29		mastic #28	" "
30		soft grey win gl for ext. win	ENTRANCE to 310
31		VT-VIII (red orange)	hall by 313
32		mastic #31	" "
33		VT VII	s.w by 349
34		mastic #33	" "
35		VT-IX (GOLD)	clrm 328
36		mastic #35	" "
37		AT-I	3rd FL main hall
38		SAT-I	clrm 324
39		red duct sealant	AC, mc by 351
~~39~~ (40)		red duct sealant	AC, office by cust. Break room

Reported By: Leonard Burke Date: 11/4/16 Due Date: 48 hr

Received By: Date:

3o 4

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

Town/City: Worcester, MA Building Name South High Community School

Sample	Result	Description of Material	Sample Location
41		Black coating on metal duct	AC, MC by 328
42		Black coating on metal duct	AC, MC by J-31
43		Black coating on metal duct	AC, MC by 351
44		rough finish on gyp wall	@ bottom edge of wall underside of stairs
45		JC #44	up to 2nd FL by cust Break rm
46		smooth ceiling plaster (CP)	rm 117
47		smooth CP	J-10
48		slightly rough CP	Aud, from rear
49		slightly rough CP	Aud., from rear
50		soft grey gl for small win in metal door,	rear of Aud. ENTRANCE door
51		painted Finish on cmu wall	rm 117
52		JC	Front of STAGE (Aud.)
53		JC	Guidance
54		SAT-I	crm 242
55		AT-I	2nd FL main hall
56		residue glue daub on cmu wall,	assumed for pre-exist chalkboard crm 242
57		Brown mastic for cove base	hall along Boy's Lockers
58		VT-V ?	CAFE
59		mastic #58	" "
60		VT-XI	Teachers Dining (rm 283)

Reported By: Date: 11/4/14 Due Date: 48 hr

Received By: Date:

4 of 4

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

Town/City: Worcester, MA Building Name South Community H.S.

Sample	Result	Description of Material	Sample Location
61		mastic #60	rm 283
62		VT-X	hall by 293
63		mastic #62	" "
64		VT-IX	rear corridor hall to Aud.
65		mastic #64	" " "
66		paint on Beam	Pool Bldg
67		vert. caulk in cmu	Pool Bldg
68		(E) off FG	AC by 122
69		red duct sealant	AC by 122
70		slight rough finish on gyp	clg, underside of sw by E-12
71		JC ,	main Hall @ 2nd Fl, above AT-1
72		residue Fireproofing	main Hall @ 2nd Fl, above AT-I

Reported By: Leonard Busa Date: 11/4/16 Due Date: 48-hr

Received By: Date:

011607529

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

Test for Mercury
72-hour TAT

Town/City: Worcester, MA Building Name South High

	Sample	Result	Description of Material	Sample Location
1	1		Rubber floor	Gym
2	2		|	Gym
3	3		|	Room 292
4	4		|	Room 293

Reported By: Jason Bacotte Date: 11-3-16 Due Date:

Received By: 23-UC Date: 11/7/16 9:00am

emailed for sample date - MG 11/7/16
per client sampled on 11/3/16 - MG

RECEIVED
NOV 04 2016
By 11:53

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

11/9/2016

Phone: (508) 628-5486
Fax: (508) 628-5488

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 11/7/2016. The results are tabulated on the attached data pages for the following client designated project:

Worcester, MA / South High

The reference number for these samples is EMSL Order #011607529. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Approved By:

Phillip Worby, Chemistry Laboratory Manager

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

EMSL Order: 011607529
CustomerID: UEC63
CustomerPO:
ProjectID:

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488
Received: 11/07/16 9:00 AM

Project: **Worcester, MA / South High**

Analytical Results

Client Sample Description 1
Gym
Collected: 11/3/2016 ***Lab ID:*** *0001*

Method	***Parameter***	***Result***	***RL***	***Units***	***Prep Date***	***Analyst***	***Analysis Date***	***Analyst***
7471B	Mercury	180	44	mg/Kg	11/8/2016	CM	11/8/2016	CM

Client Sample Description 2
Gym
Collected: 11/3/2016 ***Lab ID:*** *0002*

Method	***Parameter***	***Result***	***RL***	***Units***	***Prep Date***	***Analyst***	***Analysis Date***	***Analyst***
7471B	Mercury	51	4.2	mg/Kg	11/8/2016	CM	11/8/2016	CM

Client Sample Description 3
Room 292
Collected: 11/3/2016 ***Lab ID:*** *0003*

Method	***Parameter***	***Result***	***RL***	***Units***	***Prep Date***	***Analyst***	***Analysis Date***	***Analyst***
7471B	Mercury	120	22	mg/Kg	11/8/2016	CM	11/8/2016	CM

Client Sample Description 4
Room 293
Collected: 11/3/2016 ***Lab ID:*** *0004*

Method	***Parameter***	***Result***	***RL***	***Units***	***Prep Date***	***Analyst***	***Analysis Date***	***Analyst***
7471B	Mercury	82	4.6	mg/Kg	11/8/2016	CM	11/8/2016	CM

Definitions:

ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit (Analytical)

OrderID: 131605426

131605426

UEC universal environmental consultants
12 Brewster Road
Framingham, MA 01702
Phone: 508.628.5486
Fax: 508.628.5488

CHAIN OF CUSTODY

BUILDING / SITE NAME: South High
TOWN / CITY: Worcester
WORK AREA:
STATE: MA

Analysis Type	Turnaround Time (x) 6-8 Hr	12 Hr	24 Hr	48 Hr	72 hr
TEM / AHERA					
TEM / Level II					
TEM / Dust					
TEM / Bulk					
TEM / Water					
PLM					
Mold				X	
Other:					

Specific Project Notes

SAMPLE ID	MATERIAL DESCRIPTION	SAMPLE LOCATION	START	STOP	TIME	L/MIN	VOLUME
1	23560211	Ram 327	1515	1525	10	15	150
2	23560954	Ram 338	1518	1528	10	15	150
3	23561167	Ram 356	1526	1536	10	15	150
4	23560841	Ram 303	1530	1540	10	15	150
5	23561062	Ram 308	1537	1547	10	15	150
6	23560240	Ram 212 Guidance	1542	1552	10	15	150
7	23560866	Main office	1549	1559	10	15	150
8	23560860	Ram 246	1553	1603	10	15	150
9	23561189	Library	1602	1612	10	15	150
10	23560858	Ram 233	1605	1615	10	15	150
11	23560881	Ram 102	1613	1623	10	15	150
12	23560891	Ram ~~48~~ 122	1618	1628	10	15	150
13	23316919	Ram 115	1624	1634	10	15	150
14	23560865	Ram 154	1629	1639	10	15	150
15	23560862	Ram 158	1635	1645	10	15	150
16	23561138	Gym	1641	1651	10	15	150
17	23316853	Ram 266 music	1646	1656	10	15	150
18	23316855	Auditerium	1652	1702	10	15	150
19	23316873	cafeteria	1657	1707	10	15	150
20	23316906	outside	1704	1714	10	15	150

SAMPLED BY: Jason Becotte	DATE/TIME: 11-3-16	RECEIVED BY:	DATE/TIME:
RELINQUISHED BY:	DATE/TIME:	RECEIVED IN LAB BY:	DATE/TIME:

RECEIVED
NOV 04 2016
By 11:53

WI

EMSL Analytical, Inc.
7 Constitution Way, Suite 107 Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 131605426
Customer ID: UEC63
Customer PO:
Project ID:

Attn: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected:
Received: 11/04/2016
Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:		**131605426-0001**			**131605426-0002**			**131605426-0003**	
Client Sample ID:		**1-23560211**			**2-23560954**			**3-23561167**	
Volume (L):		**150**			**150**			**150**	
Sample Location		**Room 327**			**Room 338**			**Room 356**	
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	1	20	3	2	40	11.4
Aspergillus/Penicillium	-	-	-	2*	10*	1.5	-	-	-
Basidiospores	8	200	85.5	28	570	86.4	10	210	60
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	2	40	6.1	7	100	28.6
Curvularia	1*	7*	3	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	7*	3	1	20	3	-	-	-
Pithomyces	1	20	8.5	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**11**	**234**	**100**	**34**	**660**	**100**	**19**	**350**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 11/08/2016 11:40:33

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.
7 Constitution Way, Suite 107 Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 131605426
Customer ID: UEC63
Customer PO:
Project ID:

Attn: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected:
Received: 11/04/2016
Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:		**131605426-0004**			**131605426-0005**			**131605426-0006**	
Client Sample ID:		**4-23560841**			**5-23561062**			**6-23560240**	
Volume (L):		**150**			**150**			**150**	
Sample Location		**Room 303**			**Room 308**			**Room 212 Guidance**	
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	1	20	6.1	-	-	-	2	40	6.6
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	15	310	93.9	6	100	83.3	27	550	90.2
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	20	16.7	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	1	20	3.3
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**16**	**330**	**100**	**7**	**120**	**100**	**30**	**610**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 11/08/2016 11:40:33

EMSL Analytical, Inc.
7 Constitution Way, Suite 107 Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 131605426
Customer ID: UEC63
Customer PO:
Project ID:

Attn: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected:
Received: 11/04/2016
Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:		**131605426-0007**			**131605426-0008**			**131605426-0009**	
Client Sample ID:		**7-23560866**			**8-23560860**			**9-23561189**	
Volume (L):		**150**			**150**			**150**	
Sample Location		**Main Office**			**Room 246**			**Library**	
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	7	100	50	6	100	45.5	2	40	66.7
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	5	100	50	7	100	45.5	3*	20*	33.3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	20	9.1	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**12**	**200**	**100**	**14**	**220**	**100**	**5**	**60**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	1*	7*	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 11/08/2016 11:40:33

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Order: 131605426
Customer ID: UEC63
Customer PO:
Project ID:

Attn: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected:
Received: 11/04/2016
Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	**131605426-0010**			**131605426-0011**			**131605426-0012**		
Client Sample ID:	**10-23560858**			**11-23560881**			**12-23560891**		
Volume (L):	**150**			**150**			**150**		
Sample Location	**Room 233**			**Room 102**			**Room 122**		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	1	20	3.5	-	-	-	-	-	-
Aspergillus/Penicillium	4	80	13.9	1	20	9.1	-	-	-
Basidiospores	20	410	71.1	9	200	90.9	6	100	93.5
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	2	40	6.9	-	-	-	1*	7*	6.5
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	7*	1.2	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	1	20	3.5	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**29**	**577**	**100**	**10**	**220**	**100**	**7**	**107**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	2	-
Background (1-5)	-	2	-	-	1	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other approved signatory

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Initial report from: 11/08/2016 11:40:33

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EMSL Order: 131605426
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Phone: (617) 984-9772
Fax: (508) 628-5488
Collected:
Received: 11/04/2016
Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	**131605426-0013**			**131605426-0014**			**131605426-0015**		
Client Sample ID:	**13-23316919**			**14-23560865**			**15-23560862**		
Volume (L):	**150**			**150**			**150**		
Sample Location	**Room 115**			**Room 154**			**Room 158**		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	2	40	5.6	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	1	20	74.1	33	680	94.4	4	80	100
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	1*	7*	25.9	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**2**	**27**	**100**	**35**	**720**	**100**	**4**	**80**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other approved signatory

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 11/08/2016 11:40:33

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Fax: (508) 628-5488
Collected:
Received: 11/04/2016
Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	**131605426-0016 16-23561138 150 Gym**			**131605426-0017 17-23316853 150 Room 266 Music**			**131605426-0018 18-23316855 150 Auditorium**		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	2	40	3.4	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	3	60	32.1	8	200	20
Basidiospores	55	1100	93.2	6	100	53.5	36	740	74
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	2	40	3.4	-	-	-	3	60	6
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	20	10.7	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	1*	7*	3.7	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**59**	**1180**	**100**	**11**	**187**	**100**	**47**	**1000**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	3	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

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Steve Grise, Laboratory Manager
or other approved signatory

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Collected:
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Analyzed: 11/08/2016

Project: South High, Worcester MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	**131605426-0019**			**131605426-0020**					
Client Sample ID:	**19-23316873**			**20-23316906**					
Volume (L):	**150**			**150**					
Sample Location	**Cafeteria**			**Outside**					
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	-	-	-
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	1	20	5.7	55	1100	7.7	-	-	-
Aspergillus/Penicillium	-	-	-	18	370	2.6	-	-	-
Basidiospores	15	310	88.6	618	12700	88.4	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	1	20	5.7	7	100	0.7	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	1	20	0.1	-	-	-
Myxomycetes++	-	-	-	1	20	0.1	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	2	40	0.3	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	1	20	0.1	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**17**	**350**	**100**	**703**	**14370**	**100**	-	-	-
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	-	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	-	-
Skin Fragments (1-4)	-	2	-	-	1	-	-	-	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	-	-
Background (1-5)	-	1	-	-	1	-	-	-	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other approved signatory

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 11/08/2016 11:40:33

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NELAC NY 11769
NRPP 101193 AL
NRSB ARL0017

EPA Method #402-R-92-004
Liquid Scintillation
NRPP Device Code 8088
NRSB Device Code 12193

Laboratory Report for:

Universal Environmental Consultant
12 Brewster Road
Framingham MA 01702

Property Tested: Project # South High Community
High School
Not Indicated 3263368 3263355
Worcester MA

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
2007660	3263368	11/02/2016 2:45 pm	11/04/2016 4:12 pm	First Floor C RM 161	4.1
2007661	3263353	11/02/2016 2:48 pm	11/04/2016 4:09 pm	First Floor C RM 114 OV. SR.	0.6
2007662	3263348	11/02/2016 2:51 pm	11/04/2016 4:16 pm	First Floor C RM 121	1.0
2007663	3263356	11/02/2016 2:53 pm	11/04/2016 4:18 pm	First Floor C RM 122	0.9
2007664	3263349	11/02/2016 2:56 pm	11/04/2016 4:23 pm	First Floor C RM Outside 152 Entrance	0.9
2007665	3263346	11/02/2016 2:58 pm	11/04/2016 4:30 pm	First Floor C RM 101 BR CABINET	< 0.4
2007666	3263354	11/02/2016 3:05 pm	11/04/2016 4:32 pm	First Floor C RM 105 ABC'S	< 0.4
2007667	3263358	11/02/2016 3:08 pm	11/04/2016 4:34 pm	First Floor C RM 158	1.1
2007668	3263352	11/02/2016 3:09 pm	11/04/2016 4:35 pm	First Floor C RM 157 STOOGES	0.8
2007669	3263347	11/02/2016 3:12 pm	11/04/2016 4:37 pm	First Floor CRM 155 CORE	0.8

Comment: Universal Environmental Consultant was emailed a copy of this report.

Test Performed By: Leonard Busa

Distributed by: Universal Environmental Consultant

Date Received: 11/08/2016 Date Logged: 11/08/2016 Date Analyzed: 11/08/2016 Date Reported: 11/09/2016

Report Reviewed By: __________ Report Approved By: __________
Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is ~+/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

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Radon in Air

NELAC NY 11769
NRPP 101193 AL
NRSB ARL0017

EPA Method #402-R-92-004
Liquid Scintillation
NRPP Device Code 8088
NRSB Device Code 12193

Laboratory Report for:

Universal Environmental Consultant
12 Brewster Road
Framingham MA 01702

Property Tested: Project # South High Community
High School
Not Indicated 3263368 3263355
Worcester MA

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
2007670	3263357	11/02/2016 3:16 pm	11/04/2016 4:21 pm	First Floor 151 Office	6.5
2007671	3263338	11/02/2016 3:19 pm	11/04/2016 4:26 pm	First Floor Cutsodial Closet J11	0.5
2007672	3263340	11/02/2016 3:22 pm	11/04/2016 4:27 pm	First Floor Storage Room G11	0.5
2007673	3263337	11/02/2016 3:25 pm	11/04/2016 4:00 pm	First Floor Hall by 163	0.9
2007674	3263359	11/02/2016 3:26 pm	11/04/2016 4:04 pm	First Floor Room 117 LOUNGE	0.4
2007675	3263339	11/02/2016 3:28 pm	11/04/2016 4:03 pm	First Floor Custodial Closet J10	1.1
2007676	3263350	11/02/2016 3:30 pm	11/04/2016 3:59 pm	First Floor Office in front of 161	1.2
2007677	3263360	11/02/2016 3:32 pm	11/04/2016 4:01 pm	First Floor E12	2.5
2007678	3263351	11/02/2016 3:38 pm	11/04/2016 4:06 pm	First Floor C RM 115	0.6
2007679	3263355	11/02/2016 3:36 pm	11/04/2016 4:08 pm	First Floor CRM 114 SPANISH	0.4

Comment: Universal Environmental Consultant was emailed a copy of this report.

Test Performed By: Leonard Busa

Distributed by: Universal Environmental Consultant

Date Received: 11/08/2016 Date Logged: 11/08/2016 Date Analyzed: 11/08/2016 Date Reported: 11/09/2016

Report Reviewed By:

Report Approved By:
Carolyn D. Koke, President, AccuStar Labs

Disclaimer:
The uncertainty of this radon measurement is ~+/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

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APPENDIX K

STORMWATER POLLUTION PREVENTION PLAN

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Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:

Worcester South High Community School

170 Apricot Street
Worcester, MA 01603
Site Telephone Number: xxx-xxx-xxxx

SWPPP Prepared For:

Lamoureux Pagano Associates
108 Grove Street, Suite 300
Worcester, MA 01605
T: 508-752-2831
F: 508-757-7769

SWPPP Prepared By:

Nitsch Engineering
120 Front Street
Worcester, MA 01608
T: 617-338-0063
F: 617-338-6472

SWPPP Preparation Date:

04 / 12 / 18

Estimated Project Dates:

Project Start Date: XX/XX/XXXX
Project Completion Date: XX/XX/XXXX

Nitsch Engineering

Contents

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

Construction Manager Responsibilities:

Fontaine Brothers shall maintain the Stormwater Pollution Prevention Plan (SWPPP) documentation and will conduct and document self-inspections required under the 2017 Construction General Permit (CGP) once every 7 days and within 24 hours of a storm event 0.25" or greater. Fontaine Brothers will provide copies of inspections reports to the Owner's Representative within 24 hours following each inspection. Incidents of non-compliance will be immediately brought to the attention of the Owner's Representative. Fontaine Brothers shall be responsible for maintaining compliance with the SWPPP, including all requirements in the CGP and will maintain erosion and sediment control Best Management Practices (BMPs) in all areas of the site under its day-to-day control.

Fontaine Brothers shall file a Notice of Intent (NOI) to be covered by the CGP and obtain coverage by the Environmental Protection Agency (EPA) before beginning construction at the project. Permit coverage will be maintained throughout the project. Fontaine Brothers shall not file a Notice of Termination (NOT) until all disturbed areas of the site under its day-to-day control have been fully stabilized with permanent erosion controls that satisfy the final stabilization requirements in the CGP or have met another criteria of the NOT. Fontaine Brothers will maintain a clean site and construction trash and debris will be picked up and disposed of properly by the end of each day.

Each Operator is responsible for advising employees and subcontractors working on this project of the requirements in the CGP and SWPPP. Particular emphasis should be placed on ensuring that employees and subcontractors do not damage BMPs and maintain compliance with the CGP.

Fontaine Brothers
Davide Fontaine, Jr, Vice President
510 Cottage Street
Springfield, MA 01104
T: 413-781-2020
Email address:

Owner's Representative Responsibilities:

Owner's Representative shall provide general oversight of the project including review of the SWPPP and any amendments, inspection reports, and corrective actions. Owner's Representative shall file a NOI to be covered by the CGP and obtain coverage by the EPA before beginning construction at the project. Permit coverage will be maintained throughout the project. Owner's Representative shall not file a notice of Termination until all disturbed areas of the site have been fully stabilized with permanent erosion controls that satisfy the final stabilization requirements in the CGP. Owner's Representative will coordinate with the Fontaine Brothers to maintain a clean site so that trash and debris will be picked up and disposed of properly by the end of the day.

Each Operator is responsible for advising employees and subcontractors working on this project of the requirements in the CGP and SWPPP. Particular emphasis should be placed on ensuring that employees and subcontractors do not damage BMPs and maintain compliance with the CGP.

Owner's Representative Company Name
Owner's Representative Contact person, Position
Street Address
Town, State, Zip Code
T: xxx-xxx-xxxx
Email Address:

Site Contractor(s):

Company Name
Contact person, Position
Street Address
Town, State, Zip Code
T: xxx-xxx-xxxx
Email Address:

If there is more than one Site Contractor conducting earth disturbing activities then list them all here.

Emergency 24-Hour Contact:

Company
Emergency Contact person, Position
T: xxx-xxx-xxxx

1.2 Stormwater Team

Construction Manager: Fontaine Brothers

Stormwater Role/Responsibility: Responsible for overseeing the development of the SWPPP, modifications and updates to the SWPPP, and for compliance with the requirements in the CGP (e.g., installing and maintaining stormwater controls, conducting site inspections, picking up trash, taking corrective actions where required, etc.).

Contact:
Davide Fontaine, Jr. , Vice President
T: xxx-xxx-xxxx
Email address

I, David Fontaine, have read the CGP and Understand the Applicable Requirements
☐ Yes
Date: __________

Site Contractor: Company

Stormwater Role/Responsibility: Responsible for compliance with the requirements in this permit (e.g., installing and maintaining stormwater controls, conducting site inspections, taking corrective actions where required, etc.).

Contact:
Contact Person, Position
T: xxx-xxx-xxxx
Email Address

Refer to the Subcontractor Certifications/Agreements in Attachment G.

Add more companies to the team as needed

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: Worcester South Community High
Project Street/Location: 170 Apricot Street
City/Town: Worcester
State: Massachusetts
ZIP Code: 01603
County or Similar Subdivision: Worcester

Project Latitude/Longitude

(Use **one** of three possible formats, and specify method)

Latitude:	Longitude:
1. 42.2442º (degrees, decimals)	1. 71.8640º (degrees, decimals)

Method for determining latitude/longitude:
☐ USGS topographic map (specify scale: ____________) ☐ GPS
☒ Other (please specify): Google Maps

Horizontal Reference Datum:
☐ NAD 27 ☐ NAD 83 ☒ WGS 84

If you used a U.S.G.S topographic map, what was the scale? ____________________________

Additional Project Information

Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ Yes ☒ No

Are you applying for permit coverage as a "federal operator" as defined in Appendix A of the CGP?
☐ Yes ☒ No

Will there be demolition of any structure built or renovated before January 1, 1980?
☒ Yes ☐ No

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space?
☒ Yes ☐ No

Was pre-development land use used for agriculture (see Appendix A of the CGP for definition of "agricultural land")?
☐ Yes ☒ No

Type of Construction Site (check all that apply): ☐ Single-Family Residential
☐ Multi-Family Residential ☐ Commercial ☐ Industrial ☒ Institutional ☐ Highway or Road
☐ Utility ☐ Other _____________

2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?
☐ Yes ☒ No

Are there any surface waters that are located within 50 feet of your construction disturbances?
☒ Yes ☐ No

Table 1 – Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4 (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
001.Curtis Pond
002.Beaver Brook
003.

Table 2 – Impaired Waters / TMDLs (Answer the following for each surface water listed in Table 1 above)

	Is this surface water listed as "impaired" on the CWA303(d) list?	If you answered yes, then answer the following:			
		What pollutant(s) are causing the impairment?	Has a TMDL been completed?	Title of the TMDL document	Pollutant(s) for which there is a TMDL
001.	☐ YES ☒ NO		☐ YES ☐ NO		
002.	☒ YES ☐ NO	**Sediment, Pathogens, Taste/Color/Odor**	☐ YES ☒ NO		
003.	☐ YES ☐ NO		☐ YES ☐ NO		

Table 3 – Tier 2, 2.5, or 3 Waters (Answer the following for each surface water listed in Table 1 above)

	Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as?
001.	☐ YES ☒ NO	
002.	☒ YES ☐ NO	Tier 2- High Quality Water
003.	☐ YES ☐ NO	

2.3 Nature of the Construction Activity

General Description of Project
Provide a general description of the construction project:

The project consists of the demolition of the existing high school building and associated parking and roadway areas. A new high school building will be constructed along with new roadways, retaining walls, and parking lots. A new stormwater management system will be constructed on the site. The existing softball/baseball fields will be reconstructed.

Size of Construction Project

Size of Property: 43 acres
Total Area of Construction Disturbances: 28 acres
Maximum Area to be Disturbed at Any One Time: 28 acres

Construction Support Activities

Include a description of the construction support activities or reference Site Maps in Attachment A that include this information.

Contact Information for Construction Support Activity:
Name: XXX
Telephone: XXX-XXX-XXXX
Email: XXXX
Address and/or Latitude and Longitude:

Business Hours
Day-Day Xa.m-Xp.m.

2.4 Sequence and Estimated Dates of Construction Activities

Phase I: Installation of Erosion and Sedimentation Control Measures

- Description
- Schedule: Month, Day Year – Month, Day Year
- Area Disturbed During Phase: xx acres
- Description of stormwater controls that will be installed/maintained during phase

Phase II: Construction of new high school building

- Description
- Schedule: Month, Day Year – Month, Day Year
- Area Disturbed During Phase: xx acres
- Description of stormwater controls that will be installed/maintained during phase

Phase III: Demolition of existing high school building

- Description
- Schedule: Month, Day Year – Month, Day Year
- Area Disturbed During Phase: xx acres
- Description of stormwater controls that will be installed/maintained during phase

Phase IV: Construction of new fields

- Description
- Schedule: Month, Day Year – Month, Day Year
- Area Disturbed During Phase: xx acres
- Description of stormwater controls that will be installed/maintained during phase

2.5 Allowable Non-Stormwater Discharges

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	**Likely to be Present at Your Site?**
Discharges from emergency fire-fighting activities	☐ YES ☒ NO
Fire hydrant flushings	☒ YES ☐ NO
Landscape irrigation	☒ YES ☐ NO
Waters used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes	☒ YES ☐ NO
Water used to control dust	☒ YES ☐ NO
Potable water including uncontaminated water line flushings	☒ YES ☐ NO
External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A of the CGP) (e.g., paint or caulk containing polychlorinated biphenyls (PCBs))	☒ YES ☐ NO
Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used.	☒ YES ☐ NO
Uncontaminated air conditioning or compressor condensate	☒ YES ☐ NO
Uncontaminated, non-turbid discharges of ground water or spring water	☒ YES ☐ NO
Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated groundwater	☒ YES ☐ NO
Construction dewatering water discharged in accordance with Part 2.4 of the CGP	☒ YES ☐ NO

Note: You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control.

2.6 Site Maps

Refer to Attachment A

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Under which criterion listed in Appendix D of the CGP are you eligible for coverage under this permit?

☒ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E**

For reference purposes, the eligibility criteria listed in Appendix D of the CGP are as follows:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of the CGP.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

For criterion A, indicate the basis for your determination that no federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's action area (as defined in Appendix A of the CGP). Check the applicable source of information you relied upon:

☐ Specific communication with staff of the U.S. Fish & Wildlife Service or National Marine Fisheries Service.
☐ Publicly available species list.
☒ Other source: NHESP data layer (August 2017 or as amended) from MassGIS, U.S. Fish and Wildlife online system Information for Planning and Conservation (IPaC) – Refer to Attachment K.

3.2 Historic Preservation

Appendix E (of the CGP), Step 1

Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike
☐ Berm
☒ Catch Basin
☐ Pond
☐ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)
☐ Culvert
☒ Other type of ground-disturbing stormwater control: Water Quality Structures, Outlet Control Structure, Subsurface Infiltration System, Drain Manhole

If you will not be installing any ground-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.

Appendix E, Step 2

If you answered yes in Step 1, have prior cultural resource surveys or other evaluations determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties? ☒ YES ☐ NO

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Do you plan to install any of the following controls? Check all that apply below.

☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

☒ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

If one or more of the above apply, then, INSERT COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND THE STATE AGENCY OR EPA REGIONAL OFFICE

SECTION 4: EROSION AND SEDIMENT CONTROLS REQUIREMENTS

Section 4 of this document describes the stormwater controls that will be implemented throughout construction. The operator must install and maintain all stormwater controls in compliance with Parts 2.2 and 2.3 of the CGP. The operator must install stormwater controls by the time construction activity in any givern portion of the site begins.

The stormwater controls shall be designed and installed in accordance with good engineering practices and applicable design specifications. Specifications titled “312500- Erosion and Sedimentation Controls,” dated ******* and prepared by Nitsch Engineering and details titled “Erosion and Sedimentation Control Details,” dated ******* and prepared by Nitsch Engineering have been provided to the contractor under separate cover.

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project’s earth disturbances? ☐ YES ☒ NO

(Note: If no, no further documentation is required for Part 4.1 in the SWPPP Template. Continue to Part 4.2.)

4.2 Perimeter Controls

General

The site will be enclosed by a temporary construction fence as shown on the Erosion and Sedimentation Control Plan in Attachment A. Construction gates will be located at the entrance to the site as shown on the Erosion and Sedimentation Control Plan and all entrances will have stabilized construction entrances. All gates and entrances to the site will be secured during non-working hours. The areas of the site that will receive pollutant discharges will be surrounded by a Specific Perimeter Control listed below as shown on the Erosion and Sedimentation Control Plan in Attachment A. Sediment tracked offsite must be removed by the end of the same workday.

Specific Perimeter Controls

Perimeter Control # 1

- BMP Description: Silt Fence.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 2

- BMP Description: Silt Fence with Wattles.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 3

- BMP Description: Super Silt Fence.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 4

- BMP Description: Wattles.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 5

- BMP Description: Silt Fence with Straw Bales.
- Installation Schedule: Prior to the Start of Construction and/or immediately after stockpile is established.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.3 Sediment Track-Out

General

Gates will be located as shown on the Erosion and Sedimentation Control Plan in Attachment A to allow for construction vehicle access. Construction access points will have a stabilized construction entrance station or wheel wash station to minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting the construction site. Where sediment has been tracked out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked out sediment into any stormwater conveyance, storm drain inlet, or water of the U.S.

Specific Track-Out Controls

Track-Out Control # 1

- BMP Description: Street Sweeping.
- Installation Schedule: Start of construction.

- Inspection Schedule: The areas adjacent to the site should be inspected daily to determine if street sweeping is required.
- Responsible Staff Construction Manager and Site Contractor(s).

Track-Out Control # 2

- BMP Description: Stabilized Construction Entrance.
- Installation Schedule: Start of construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Track-Out Control # 3

- BMP Description: Wheel Wash Station.
- Installation Schedule: Start of construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective. condition as described in part 2.1.4 of the CGP(s). The operator must provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters. The operator must ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water. For storage of soaps, detergents, or solvents, the operator shall provide either a cover to minimze the exposure of these detergents to precipitation and to stormwater, or a similarily effective means designed to minimze discharge of pollutants from these areas.
- Responsible Staff: Construction Manager and Site Contractor.

4.4 Stockpiled Sediment or Soil

General

All soil stockpiles will be located outside of any natural buffers and away from existing and proposed catch basins and area drains and outside of proposed infiltration system footprints. A sediment barrier shall be installed along all downgradient perimeter areas. Examples of sediment barriers include silt fence, super silt fence, or wattles.

You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the U.S.

For stockpiles that will be unused for 14 or more days, a cover such as a tarp or blown straw shall be provided or temporary stabilization should be provided (consistent with Part 2.2.14 of the CGP).

Specific Stockpile Controls

Stockpile Control # 1

- BMP Description: Silt Fence.
- Installation Schedule: Immediately after stockpile is established.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.

	Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Stockpile Control # 2

• BMP Description:	Wattles.
• Installation Schedule:	Immediately after stockpile is established.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Stockpile Control # 3

• BMP Description:	Tarp.
• Installation Schedule:	When stockpile will remain inactive for 14 or more calendar days.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Stockpile Control # 4

• BMP Description:	Straw Bales.
• Installation Schedule:	Immediately after stockpile is established.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Stockpile Control # 5

• BMP Description:	Blown Straw.
• Installation Schedule:	When stockpile will remain inactive for 14 or more calendar days.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Stockpile Control # 6

• BMP Description:	Hydroseeding.
• Installation Schedule:	When stockpile will remain inactive for 14 or more calendar days.

• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

4.5 Minimize Dust

General

Disturbed land will be temporarily stabilized as required by the CGP. Dust will be minimized using measures including sprinkling/irrigation, vegetative cover, mulch, and/or stone. Stockpiles will be handled in accordance with section 4.4 of the SWPPP.

Earth-disturbing activities are considered temporarily ceased when work will not resume for a period of 14 or more calendar days. Stabilization shall be initiated when earth-disturbing activities are temporarily or permanently ceased. Stabilization activities shall be complete within 7 calendar days after the initiation of soil stabilization measures.

Specific Dust Controls

Dust Control # 1

• BMP Description:	Sprinkling/Irrigation.
• Installation Schedule:	As needed throughout earthwork activities as determined by the site contractor and construction manager.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Dust Control # 2

• BMP Description:	Straw or Mulch.
• Installation Schedule:	As needed throughout earthwork activities as determined by the site contractor and construction manager. When disturbed land will remain inactive for 14 or more calendar days.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
• Responsible Staff:	Construction Manager and Site Contractor(s).

4.6 Minimize the Disturbance of Steep Slopes

General

Steep slopes (defined as slopes of 15% or greater in grade) are expected to be disturbed onsite. Disturbances to steep slopes will be minimized by phasing disturbances to those areas and by using stabilization practices designed to be used on steep grades.

Specific Steep Slope Controls

Steep Slope Control # 1

- BMP Description: Straw or Mulch.
- Installation Schedule: When disturbed land will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective. condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Steep Slope Control # 2

- BMP Description: Hydroseeding.
- Installation Schedule: When disturbed land will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Steep Slope Control # 3

- BMP Description: Soil Stabilization Mats.
- Installation Schedule: When disturbed land will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Steep Slope Control # 4

- BMP Description: Rip-Rap.
- Installation Schedule: When disturbed land will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.7 Preserve Native Topsoil

Onsite native topsoil shall be preserved, unless infeasible. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.

Stockpiling topsoil at off-site locations or transferring topsoil to other locations is an example of a way to preserve naïve topsoil.

The contractor shall perform construction sequencing such that earth materials are exposed for a minimum of time before they are covered, seeded, or otherwise stabilized.

4.8 Minimize Soil Compaction

General

In areas where infiltration practices will be installed or areas of the site where final vegetative stabilization will occur, soil compaction shall be minimized. This includes restricting vehicle access and equipment use.

Areas used for post-construction infiltration shall be constructed after all ground surfaces are fully stabilized when feasible. If proposed infiltration areas are constructed prior to the site being fully stabilized, additional erosion controls shall be installed. All stockpiled and material storage areas shall be located outside of the areas proposed for post-construction infiltration.

Areas of post-construction landscaping shall be constructed after all ground surface are fully stabilized. If proposed landscaped areas are constructed prior to the site being fully stabilized, additional erosion controls shall be installed. All soil stockpiles and material storage areas shall be located outside of the areas proposed for post-construction landscaping where feasible. Where this is not feasible, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth prior to planting.

4.9 Storm Drain Inlets

General

All existing and proposed storm drain inlets affected by construction activities should be protected using an Inlet Sediment Filter as shown on the Erosion and Sedimentation Control Plan provided in Attachment A.

Clean or remove and replace the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

Specific Storm Drain Inlet Controls

Storm Drain Inlet Control # 1

• BMP Description:	Inlet Sediment Filter.
• Installation Schedule:	Prior to the Start of Construction.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective. condition as decribed in part 2.1.4 of the CGP.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Storm Drain Inlet Control # 2

• BMP Description:	Inlet Protection with Gravel.
• Installation Schedule:	Prior to the Start of Construction .
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Storm Drain Inlet Control # 3

• BMP Description:	Inlet Protection with Block and Gravel.
• Installation Schedule:	Prior to the Start of Construction.

- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.10 Minimize Erosion of Stormwater Conveyances

The contractor shall minimize erosion of stormwater conveyance channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters. The contractor shall install erosion controls and velocity dissipation devices within and along the length of any stormwater conveyance channel and at any outlet to slow down runoff to minimize erosion.

Stormwater Conveyance Control # 1

- BMP Description: Check Dam.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stormwater Conveyance Control # 2

- BMP Description: Sediment Trap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stormwater Conveyance Control # 3

- BMP Description: Rip Rap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stormwater Conveyance Control # 4

- BMP Description: Grouted Rip Rap at outlets.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.11 Sediment Basins

All sediment basins should be located outside of any waterbody, resource area, and buffer zones. Sediment basins shall be sized to provide storage for either the volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet per acre drained.

Where feasible, outlet structures that withdraw water from the surface of the sediment basin shall be used. Erosion and velocity dissipation devices shall be installed at inlets and outlets to prevent erosion.

Accumulated sediment shall be removed to maintain at least one-half of the design capacity. The basin shall be maintained so that it remains in effective operating condition.

Sediment Basin Control # 1

- BMP Description: Check Dam.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Sediment Basin Control # 2

- BMP Description: Sediment Trap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s)

Sediment Basin Control # 3

- BMP Description: Rip Rap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Sediment Basin Control # 4

- BMP Description: Grouted Rip Rap at outlets.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.12 Chemical Treatment

There are no proposed chemical treatments associated with this project.

4.13 Dewatering Practices

Dewatering will occur in a way that minimizes the discharge of pollutants in ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation. Dewatering water shall be treated in compliance with Section 2.4 of the CGP and water with visible floating solids or foam may not be discharged.

Any applicable permits shall be obtained from local permitting authorities.

Dewatering Control # 1
- BMP Description: Sediment basin or Sediment Trap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Dewatering Control # 2
- BMP Description: Sediment socks.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Dewatering Control # 3
- BMP Description: Dewatering Tanks.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater and as required by the manufacturer.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Dewatering Control # 4
- BMP Description: Filtration Systems.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater and as required by the manufacturer.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.14 Other Stormwater Controls

Any changes in construction activity that that include means of stormwater control not included in this document will be identified, the SWPPP will be amended, and the appropriate erosion and sedimentation controls will be implemented.

4.15 Site Stabilization

Initiate the installation of stabilization measures immediately in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days. Complete the installation of stabilization measures as soon as practicable, but no later than 7 calendar days after stabilization has been initiated.

Site Stabilization Practice #1
☐ *Vegetative* ☒ *Non-Vegetative*
☒ *Temporary* ☐ *Permanent*

• BMP Description:	Soil Stabilization Mat.
• Installation Schedule:	As/if required.
• Maintenance and Inspection:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Responsible Staff:	Construction Manager and Site Contractor(s).

Site Stabilization Practice #2
☒ *Vegetative* ☐ *Non-Vegetative*
☒ *Temporary* ☐ *Permanent*

• BMP Description:	Temporary Seeding.
• Installation Schedule:	As/if required.
• Maintenance and Inspection:	Once every 7 days and within 24 hours of a storm event 0.25” or greater.
• Responsible Staff:	Construction Manager and Site Contractor(s).

SECTION 5: POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Potential sources of sediment to stormwater runoff:

- Stockpiles and construction staging
- Clearing and grubbing operations
- Grading and site excavation
- Topsoil stripping
- Landscape operations
- Soil tracking offsite from construction vehicles
- Runoff from unstabilized areas
- Construction debris

Potential pollutants and sources, other than sediment, to stormwater runoff:

- Combined Staging Area – fueling activities, equipment maintenance, sanitary facilities, and hazardous waste storage
- Materials Storage Area – building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
- Construction Activity-paving, curb installation, concrete pouring, and building construction

Staging areas are shown on the Erosion and Sedimentation Control Plan provided in Attachment A.

Construction Site Pollutants

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)	**Location on Site** (or reference SWPPP site map where this is shown)
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Chlorinated hydrocarbons, organophosphates, carbonates, arsenic	Herbicides used for noxious weed control
Fertilizers	Nitrogen, phosphorous	Newly seeded areas
Plaster	Calcium sulphate, calcium carbonate, sulfuric acid	Building construction
Cleaning Solvents	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits
Asphalt	Oil, petroleum distillates	Streets and parking lots
Concrete	Limestone, sand pH, chromium	Curb and gutter, sidewalk, building construction
Glue, Adhesives	Polymers, epoxies	Building construction
Paints	Metal oxides, Stoddard solvent, talc, calcium carbonate, arsenic	Building construction
Curing compounds	Naphtha	Curb and gutter, building construction
Wood preservatives	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	Timber pads, bracing, building construction
Hydraulic Oils/fluids	Mineral oil	Leaks/broken hoses from equipment
Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment/staging area
Kerosene	Coal oil, petroleum distillates	Secondary containment/staging area
Antifreeze/coolant	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment
Sanitary toilets	Bacteria, parasites, and viruses	Staging area

5.2 Spill Prevention and Response

BMP Description: Spill kit, vehicle washing, silt sack catch basin protection, silt fence
Installation Schedule: Start of construction activity
Maintenance and Inspection: Minimum weekly & as necessary
Responsible Staff: Construction Manager and Site Contractor

- Major vehicle maintenance onsite is prohibited
- Re-fueling of vehicles within 25 feet of a drainage structure is prohibited
- Spill kit shall be kept onsite consisting of:
  - Gloves
  - Absorbent mats
  - Drip pan

Spill Prevention and Control Plan

- Refer to contractor’s Spill Plan.
- Manufacturers’ recommended spill control methods will be posted onsite and site personnel will be made aware of the requirements.
- Cleanup supplies will be kept onsite in a materials storage area. This equipment will include: goggles, brooms, dustpans, mops, rags, gloves, oil absorbent, sawdust, plastic and metal trash cans, and other materials and supplies specifically designated for cleanup.
- All spills will be immediately cleaned up after discovery.
- The spill area will be well ventilated.
- Cleanup personnel will wear suitable protective clothing.
- Spills of toxic and/or hazardous material will be reported to state, local, and Federal authorities, as required by law. Spills shall also be reported immediately to the owner.
- A spill incident report will be filed detailing the amount and extent of the spill, material(s) involved, and effectiveness of the cleanup. This report will be on file at the Construction Manager/Site Contractor office, as well as kept onsite in the field office. A copy shall also be filed with the Hazard Communication Coordinator (HCC).

The Construction Manager/Site Contractor will designate someone onsite that will serve as the Spill Cleanup Coordinator. At least two other personnel will be designated as alternate spill coordinators. All spill control personnel will be trained in spill prevention, control, and cleanup. The names of the responsible personnel will be posted at the jobsite office of the Construction Manager/ Site Contractor.

5.3 Fueling and Maintenance of Equipment or Vehicles

General

Minor vehicle and equipment emergency maintenance can be performed onsite away from drainage structures. Major vehicle and equipment maintenance must be performed offsite. Equipment/vehicle storage areas and any onsite fuel tanks will be inspected weekly and after storm events. Equipment and vehicles will be inspected for leaks, equipment damage, and other service problems on each day of use. Any leaks will be repaired immediately or the equipment/vehicle will be removed from the site.

Minor vehicle and equipment emergency maintenance shall occur when a vehicle cannot be safely removed from the site. The vehicle should be repaired so it can be taken off-site so that the rest of the maintenance can occur.

Major vehicle maintenance onsite is prohibited. Re-fueling or maintenance of vehicles within 25 feet of a drainage structure shall be prohibited. Drip pans, drip cloths, or absorbent pads should be used when replacing spent fluids. The fluids should be collect and stored prior to being disposed of offsite.

Specific Pollution Prevention Practice #1

- BMP Description: Spill Kit.
- Installation Schedule: Onsite throughout construction.
- Responsible Staff: Construction Manager and Site Contractor.

Specific Pollution Prevention Practice #1

- BMP Description: Drip Pans, Drip Cloths, Absorbent Pads.
- Installation Schedule: Onsite throughout construction.
- Responsible Staff: Construction Manager and Site Contractor.

5.4 Washing of Equipment and Vehicles

General

Vehicle and equipment washout areas shall be constructed by the contractor so that no untreated water enters the storm drain system. Soaps, detergents, or solvents must be stored in a way to prevent these detergents from coming into contact with rainwater, or a similarly effective means designed to prevent the discharge of pollutants from these areas.

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

- BMP Description: Designated vehicle/equipment washing areas
- Installation Schedule: Start of construction.
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Responsible Staff: Construction Manager and Site Contractor

Pollution Prevention Practice # 2

- BMP Description: Spill kit, vehicle washing, straw bale catch basin protection, silt fence
- Installation Schedule: Start of construction activity
- Inspection Schedule: Once every 7 days and within 24 hours of a storm event 0.25” or greater.
- Responsible Staff: Construction Manager and Site Contractor

5.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

5.5.1 Building Products

General

The contractor will recycle all construction materials possible. For materials that cannot be recycled, solid waste will be disposed of in accordance with DEP Regulations for Solid Waste Facilities, 310 CMR 10.00.

Any building materials required to be stored onsite will be stored at a combined staging and materials storage area as shown on the CMP. Larger items will be elevated by appropriate methods to minimize contact with runoff. The storage area will be inspected weekly and after storm events. It will be kept clean, organized, and equipped with appropriate cleaning supplies.

Building product usage shall follow the following good housekeeping BMPs:

- The Responsible Staff: Construction Manager or Site Contractor representative will inspect daily for inspection of the work area to ensure proper management of waste materials.
- Store only enough material onsite required for that job as to satisfy current construction needs.
- Store required materials in tightly lidded containers under cover.
- Store materials in original containers with clearly legible labels.
- Separate and store materials apart from each other.
- Do not mix materials unless specifically in accordance with manufacturers' recommendations.
- Use all products from a container before disposing of the container.
- Follow manufacturers' instructions for handling, storage, and disposing of all materials.
- All materials shall be stored in an area to prevent the discharge of pollutants from building products.

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

• BMP Description:	Perimeter Protection control around Stockpiles.
• Installation Schedule:	Start of construction/ Immediately after stockpile is established.
• Inspection Schedule:	Once every 7 days and within 24 hours of a storm event 0.25" or greater.
• Maintenance:	Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
• Responsible Staff:	Construction Manager and Site Contractor(s).

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

- In storage areas, provide either (1) cover to minimize the exposure of these chemicals to precipitation and to stormwater or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.
- Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label.

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

General

- Only skilled personnel in a designated area will perform fueling of vehicles onsite.
- Vehicles used onsite will be monitored for fuel and oil leaks.
- Vehicles used onsite will be maintained in good working order.
- Asphalt substances will be applied in accordance with manufacturers' recommendations.
- The use of petroleum products as a release agent for asphalt transport trucks is prohibited.
- Vehicle fueling will only be done in vehicle fueling areas located by the contractor. See section 5.3 of the SWPPP.
- The contractor shall be responsible for locating the fuel storage and re-fueling area onsite to minimize disturbance to construction activates and site area.
- Construction equipment not in active use for 5 minutes or more will be turned off.

5.5.4 Hazardous or Toxic Waste

(Note: Examples include paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids.)

General

- Keep products in their original containers.
- Original container labels should be clearly visible.
- Material safety data sheets will be kept onsite and be available.
- Follow all state, local, and Federal regulations regarding the handling, use, storage, and disposal of hazardous material.

Paints:

- All paint containers will be tightly sealed when not in use.
- Remove excess paint in original labeled containers from the jobsite.
- Paint will not be disposed of onsite. Remove excess paint material from the site and legally dispose of.
- Paint shall not be disposed of in the storm drain system.

5.5.5 Construction and Domestic Waste

General
The contractor will manage domestic waste onsite. The contractor will provide waste containers of sufficient size and number to contain construction and domestic wastes. The waste container lids will be kept closed when not in use and lids will be closed at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either a cover or a similarly effective means designed to minimize discharge of pollutants. Clean up immediately if containers overflow.

Pollution Prevention Practice # 1

- BMP Description: Dumpster.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: Weekly and covered daily.
- Responsible Staff: Construction Manager and Site Contractor(s).

Pollution Prevention Practice # 2

- BMP Description: Litter/debris pick-up.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: Daily.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.5.6 Sanitary Waste

All sanitary waste portable toilets shall be positioned so that they are secure and will not be tipped or knocked over, and located away from any stormwater inlets or conveyances.

Pollution Prevention Practice # 1

- BMP Description: Porta John.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: As manufacturer requires.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.6 Washing of Applicators and Containers used for Paint, Concrete, or Other Materials

General
Washing of applicators and containers used for paint, concrete, or other materials shall follow the following good housekeeping BMPs:

- An effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, concrete, form release oils, curing compounds, and other construction materials.
- All washwater must be directed into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.
- Washout and cleanout wastes should be handled as follows:
  - Do not dump liquid wastes into storm sewers.
  - Dispose of liquid wastes in accordance with applicable requirements.
  - Remove and dispose of hardened concrete waste consistent with the handling of other construction wastes.
- Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas.

Pollution Prevention Practice # 1

- BMP Description: Designated applicator and container washing areas.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: Daily.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.7 Fertilizers

General
If fertilizer is required onsite, installation will follow the following guidelines:

- Fertilizers will be used at the application rates called for in the specifications for the project.
- Once applied, fertilizer will be worked into the soil to minimize wash off from irrigation and stormwater.
- Fertilizer will be stored under cover.
- The contents of partially used fertilizer bags will be transferred to re-sealable, watertight containers clearly labeled with their contents.
- Avoid applying before heavy rains.
- Never apply to frozen ground.
- Never apply to stormwater conveyance channels with flowing water.

5.8 Other Pollution Prevention Practices

Any changes in construction activity that produce other allowable non-stormwater discharges will be identified, the SWPPP will be amended and the appropriate erosion and sedimentation controls will be implemented.

Control # X

- BMP Description: Description of control to be installed.
- Installation Schedule: Approximate date of installation.
- Inspection Schedule: Pick Inspection schedule from above.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

SECTION 6: INSPECTION AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Personnel Responsible for Inspections

Construction Manager
Contact Person

Site Contractor
Contact person

(Note: All personnel conducting inspections must be considered a "qualified person." CGP Part 4.1.1 clarifies that a "qualified person" is a person knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.)

Inspection Schedule

Specific Inspection Frequency

The contractor shall inspect and maintain erosion control measures, and remove sediment therefrom, once every 7 days and within 24 hours of a storm event 0.25" or greater

Rain Gauge Location:

NOAA Rain Gauge Location or Onsite Rain Gauge Location

Reductions in Inspection Frequency (if applicable):

Inspection frequency may be reduced to twice per month (no more than 14 days apart) for the first month in areas of the site where the stabilization steps outlines in Parts 2.2.14 of the CGP have been completed. After the first month, inspection frequency may be reduced to once per month. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3 as applicable. You must document the beginning and ending dates of this period in the SWPPP.

Inspection frequency may be reduced to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater if the project is located in an arid, semi-arid, or drought-stricken area and construction is occurring during the seasonally dry period or a period in which drought is predicted to occur. If this inspection frequency is followed, you must document the beginning and ending dates of this period in the SWPPP.

Inspections can be temporarily suspended under the following conditions:

- Earth-disturbing activity is suspended due to frozen condition;
- Runoff is unlikely due to continuous frozen conditions that are likely to continue at the site for at least three months based on historic seasonal averaged. **If unexpected weather conditions make discharges likely, the operators must immediately resume the regular inspection schedule**;
- Land disturbances have been suspended; and
- All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a of the CGP.

Inspection frequency may be reduced to once per month under the following conditions:

- The operator is still conducting earth disturbing activities under frozen conditions;
- Runoff is unlikely due to continuous frozen conditions that are likely to continue at the site for at least three months based on historic seasonal averages. **If unexpected weather conditions make discharges likely, the operator must immediately resume the regular inspection schedule**; and
- Except for areas in which the operator is conducting earth-disturbing activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a of the CGP.

Inspection Report Forms
Copies of inspection reports are in Attachment D.

6.2 Corrective Action

Personnel Responsible for Corrective Actions
Contact Person, Construction Manager Company
Contact Person, Site Contractor

Corrective Action Forms
A copy of the Corrective Action Form is in Attachment E.

6.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):
Construction Manager Company
Contact Person
Contact Person Title
Street Address
Town/City, State Zip Code
xxx-xxx-xxxx
Email address

SECTION 7: TRAINING LOG

Refer to Attachment I for a Training Log to be completed for each SWPPP training session**.**

Table 7-1: Documentation for Completion of Training

Name	Date Training Completed

SECTION 8: CERTIFICATION AND NOTIFICATION

Operator – Owner's Representative

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ______________________________ Title: ______________________________

Signature: ______________________________________ Date: ________________

Operator – Construction Manager

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ______________________________ Title: ______________________________

Signature: ______________________________________ Date: ________________

SWPPP ATTACHMENTS

Attach the following documentation to the SWPPP:

Attachment A – Site Maps

Attachment B – 2017 Construction General Permit

Attachment C – NOI and EPA Authorization Email

Attachment D – Inspection Form

Attachment E – Corrective Action Form

Attachment F – SWPPP Amendment Log

Attachment G – Subcontractor Certifications/Agreements

Attachment H – Grading and Stabilization Activities Log

Attachment I – SWPPP Training Log

Attachment J – Delegation of Authority Form

Attachment K – Endangered Species Documentation

Attachment L – Historic Preservation Documentation

Attachment M – Rainfall Gauge

Attachment N – Order of Conditions

Attachment A – Site Maps

Site Maps must include the following:

- a) Boundaries of the property. The map(s) in the SWPPP must show the overall boundary of the property.
- b) Locations where construction activities will occur. The map(s) in the SWPPP must show the locations where construction activities will occur, including
  - i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;
  - ii. Approximate slopes before and after major grading activities (note any steep slopes);
  - iii. Locations where sediment, soil, or other construction materials will be stockpiled;
  - iv. Any water of the U.S. crossings;
  - v. Designated points where vehicles will exit onto paved roads;
  - vi. Locations of structures and other impervious surfaces upon completion of construction;
  - vii. Locations of onsite and off-site construction support activity areas covered by the permit (see Part 1.2.1.c).
- c) Locations of all waters of the U.S. within and one mile downstream of the site's discharge point. Also identify if any are listed as impaired, or are identified as a Tier 2, Tier 2.5, or Tier 3 water.
- d) Areas of federally listed critical habitats within the site and/or at discharge locations.
- e) Type and extent of pre-construction cover on the site (e.g., vegetative cover, forest, pasture, pavement, structures).
- f) Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities.
- g) Stormwater and authorized non-stormwater discharge locations. The permit requires the site map to show information pertaining to discharge locations including:
  - i. Locations where stormwater and/or authorized non-stormwater will be discharges to storm drain inlets; and
  - ii. Locations where stormwater and/or authorized non-stormwater will be discharged directly to waters of the U.S.
- h) Locations of all potential pollutant-generating activities identified in Part 7.2.3.g. The permit requires identification in the site map of all potential pollutant-generating activities identified in Part 7.2.3.g.
- i) Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit. The permit requires identification on the site map of the location of stormwater control measures.
- j) Locations where polymers, flocculants, or other treatment chemicals will be used and stored. The permit requires identification on the site map of the locations where polymers, flocculants, or other treatment chemicals will be used and stored.

Include the following if possible:

- LOCUS Map created with GIS
- USGS Map created with GIS
- Phasing Plans/Mobilization Plans/Construction Management Plans from the contractor
- Erosion and Sedimentation Control Plans

Attachment B – 2017 Construction General Permit

National Pollutant Discharge Elimination System General Permit for Discharges from Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) general permit, are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of construction activities" (see Appendix A) until one of the conditions for terminating CGP coverage has been met (see Part 8.2).

This permit becomes effective on **February 16, 2017**.

This permit and the authorization to discharge expire at 11:59pm, **February 16, 2022.**

Signed and issued this 11th day of January 2017

Deborah Szaro,
Acting Regional Administrator, EPA Region 1

Signed and issued this 11th day of January 2017

Javier Laureano, Ph.D.,
Director, Clean Water Division, EPA Region 2

Signed and issued this 11th day of January 2017

Jose C. Font,
Acting Director, Caribbean Environmental Protection Division, EPA Region 2.

Signed and issued this 11th day of January 2017

Dominique Lueckenhoff,
Acting Director, Water Protection Division, EPA Region 3

Signed and issued this 11th day of January 2017

César A. Zapata,
Deputy Director, Water Protection Division, EPA Region 4

Signed and issued this 11th day of January 2017

Christopher Korleski,
Director, Water Division, EPA Region 5

Signed and issued this 11th day of January 2017

William K. Honker, P.E.,
Director, Water Division, EPA Region 6

Signed and issued this 11th day of January 2017

Karen Flournoy,
Director, Water, Wetlands, and Pesticides Division, EPA Region 7

Signed and issued this 11th day of January 2017

Darcy O'Connor,
Assistant Regional Administrator, Office of Water Protection, EPA Region 8

Signed and issued this 11th day of January 2017

Kristin Gullatt
Deputy Director, Water Division, EPA Region 9

Signed and issued this 11th day of January 2017

Daniel D. Opalski,
Director, Office of Water and Watersheds, EPA Region 10

CONTENTS

1 HOW TO OBTAIN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP)

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for obtaining permit coverage in this Part.

1.1 ELIGIBILITY CONDITIONS

1.1.1 You are an "operator" of a construction site for which discharges will be covered under this permit. For the purposes of this permit and in the context of stormwater discharges associated with construction activity, an "operator" is any party associated with a construction project that meets either of the following two criteria:

a. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications *(e.g., in most cases this is the owner of the site);* or

b. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions *(e.g., they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor (as defined in Appendix A) of the project)*.

Where there are multiple operators associated with the same project, all operators must obtain permit coverage.[1] Subcontractors generally are not considered operators for the purposes of this permit.

1.1.2 Your site's construction activities:

a. Will disturb one or more acres of land, or will disturb less than one acre of land but are part of a common plan of development or sale that will ultimately disturb one or more acres of land; or

b. Have been designated by EPA as needing permit coverage under 40 CFR 122.26(a)(1)(v) or 40 CFR 122.26(b)(15)(ii);

1.1.3 Your site is located in an area where EPA is the permitting authority (see Appendix B);

1.1.4 Discharges from your site are not:

a. Already covered by a different NPDES permit for the same discharge; or

b. In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[2,3]

1.1.5 You are able to demonstrate that you meet one of the criteria listed in Appendix D with respect to the protection of species that are federally listed as endangered or threatened under the Endangered Species Act (ESA) and federally designated critical habitat;

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[1] If the operator of a "construction support activity" (see Part 1.2.1c) is different than the operator of the main site, that operator must also obtain permit coverage. See Part 7.1 for clarification on the sharing of liability between and among operators on the same site and for conditions that apply to developing a SWPPP for multiple operators associated with the same site.

[2] Parts 1.1.4a and 1.1.4b do not include sites currently covered under the 2012 CGP that are in the process of obtaining coverage under this permit, nor sites covered under this permit that are transferring coverage to a different operator.

[3] Notwithstanding a site being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.4a or 1.1.4b, above, EPA may waive the applicable eligibility requirement after specific review if it determines that coverage under this permit is appropriate.

1.1.6 You have completed the screening process in Appendix E relating to the protection of historic properties; and

1.1.7 You have complied with all requirements in Part 9 imposed by the applicable state, Indian tribe, or territory in which your construction activities and/or discharge will occur.

1.1.8 For "new sources" (as defined in Appendix A) only:

a. EPA has not, prior to authorization under this permit, determined that discharges from your site will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with this permit, specifically the requirement to meet water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3, will result in discharges that will not cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard.

b. Discharges from your site to a Tier 2, Tier 2.5, or Tier 3 water[4] will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not lower the water quality of such waters.

1.1.9 If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your Notice of Intent (NOI) unless and until you notify your applicable EPA Regional Office (see Appendix L) in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to discharges that cause an exceedance of water quality standards.

1.2 TYPES OF DISCHARGES AUTHORIZED[5]

1.2.1 The following stormwater discharges are authorized under this permit provided that appropriate stormwater controls are designed, installed, and maintained (see Parts 2 and 3):

a. Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR 122.26(b)(14) or 122.26(b)(15)(i);

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[4] Note: Your site will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water to which you discharge is identified by a state, tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

[5] See "Discharge" as defined in Appendix A. Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, or during an inspection.

b. Stormwater discharges designated by EPA as needing a permit under 40 CFR 122.26(a)(1)(v) or 122.26(b)(15)(ii);

c. Stormwater discharges from construction support activities *(e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)* provided that:

   i. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;

   ii. The support activity is not a commercial operation, nor does it serve multiple unrelated construction sites;

   iii. The support activity does not continue to operate beyond the completion of the construction activity at the site it supports; and

   iv. Stormwater controls are implemented in accordance with Part 2 and Part 3 for discharges from the support activity areas.

d. Stormwater discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining.

1.2.2 The following non-stormwater discharges associated with your construction activity are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Parts 2 and 3:

a. Discharges from emergency fire-fighting activities;

b. Fire hydrant flushings;

c. Landscape irrigation;

d. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;

e. Water used to control dust;

f. Potable water including uncontaminated water line flushings;

g. External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A) *(e.g., paint or caulk containing polychlorinated biphenyls (PCBs));*

h. Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;

i. Uncontaminated air conditioning or compressor condensate;

j. Uncontaminated, non-turbid discharges of ground water or spring water;

k. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

l. Construction dewatering water discharged in accordance with Part 2.4.

1.2.3 Also authorized under this permit are discharges of stormwater listed above in Part 1.2.1, or authorized non-stormwater discharges listed above in Part 1.2.2, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.3 PROHIBITED DISCHARGES[6]

1.3.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.4;

1.3.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

1.3.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

1.3.4 Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

1.3.5 Toxic or hazardous substances from a spill or other release.

To prevent the above-listed prohibited non-stormwater discharges, operators must comply with the applicable pollution prevention requirements in Part 2.3.

1.4 SUBMITTING YOUR NOTICE OF INTENT (NOI)

All "operators" (as defined in Appendix A) associated with your construction site, who meet the Part 1.1 eligibility requirements, and who seek coverage under this permit, must submit to EPA a complete and accurate NOI in accordance with the deadlines in **Table 1** prior to commencing construction activities.

Exception: If you are conducting construction activities in response to a public emergency *(e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you may discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities (see Table 1) establishing that you are eligible for coverage under this permit. You must also provide documentation in your Stormwater Pollution Prevention Plan (SWPPP) to substantiate the occurrence of the public emergency.

1.4.1 Prerequisite for Submitting Your NOI

You must develop a SWPPP consistent with Part 7 before submitting your NOI for coverage under this permit.

1.4.2 How to Submit Your NOI

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOI for coverage under the 2017 CGP, unless you received a waiver from your EPA Regional Office.

To access NeT, go to https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting.

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[6] EPA includes these prohibited non-stormwater discharges here as a reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2. Any unauthorized non-stormwater discharges must be covered under an individual permit or alternative general permit.

Waivers from electronic reporting may be granted based on one of the following conditions:

a. If your operational headquarters is physically located in a geographic area (*i.e., ZIP code or census tract*) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or

b. If you have limitations regarding available computer access or computer capability.

If the EPA Regional Office grants you approval to use a paper NOI, and you elect to use it, you must complete the form in Appendix J.

1.4.3 Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage

Table 1 provides the deadlines for submitting your NOI and the official start date of your permit coverage, which differ depending on when you commence construction activities.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Operator	**NOI Submittal Deadline**[7]	**Permit Authorization Date**[8]
Operator of a new site (*i.e., a site where construction activities commence on or after February 16, 2017*)	At least 14 calendar days before commencing construction activities.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an existing site (*i.e., a site with 2012 CGP coverage where construction activities commenced prior to February 16, 2017*)	No later than **May 17, 2017**.	
New operator of a permitted site (*i.e., an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site"*)	At least 14 calendar days before the date the transfer to the new operator will take place.	
Operator of an "emergency-related project" (*i.e., a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services*)	No later than 30 calendar days after commencing construction activities.	You are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.

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[7] If you miss the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of construction activities and discharge authorization.

[8] Discharges are not authorized if your NOI is incomplete or inaccurate or if you are not eligible for permit coverage.

1.4.4 Modifying your NOI

If after submitting your NOI you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT. Waivers from electronic reporting may be granted as specified in Part 1.4.1. If the EPA Regional Office has granted you approval to submit a paper NOI modification, you may indicate any NOI changes on the same NOI form in Appendix J.

When there is a change to the site's operator, the new operator must submit a new NOI, and the previous operator must submit a Notice of Termination (NOT) form as specified in Part 8.3.

1.4.5 Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

a. You terminate permit coverage consistent with Part 8; or

b. You receive permit coverage under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2022; or

c. You fail to submit an NOI for coverage under a revised or replacement version of this permit before the deadline for existing construction sites where construction activities continue after this permit has expired.

1.5 REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE

You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so that it is visible from the public road that is nearest to the active part of the construction site, and it must use a font large enough to be readily viewed from a public right-of-way.[9] At a minimum, the notice must include:

a. The NPDES ID (*i.e., permit tracking number assigned to your NOI*);

b. A contact name and phone number for obtaining additional construction site information;

c. The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional Office at [*include the appropriate CGP Regional Office contact information found at https://www.epa.gov/npdes/contact-us-stormwater#regional*];" and

d. The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

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[9] If the active part of the construction site is not visible from a public road, then place the notice of permit coverage in a position that is visible from the nearest public road and as close as possible to the construction site.

2 TECHNOLOGY-BASED EFFLUENT LIMITATIONS

You must comply with the following technology-based effluent limitations in this Part for all authorized discharges.[10]

2.1 GENERAL STORMWATER CONTROL DESIGN, INSTALLATION, AND MAINTENANCE REQUIREMENTS

You must design, install, and maintain stormwater controls required in Parts 2.2 and 2.3 to minimize the discharge of pollutants in stormwater from construction activities. To meet this requirement, you must:

2.1.1 Account for the following factors in designing your stormwater controls:

a. The expected amount, frequency, intensity, and duration of precipitation;

b. The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. You must design stormwater controls to control stormwater volume, velocity, and peak flow rates to minimize discharges of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and

c. The soil type and range of soil particle sizes expected to be present on the site.

2.1.2 Design and install all stormwater controls in accordance with good engineering practices, including applicable design specifications.[11]

2.1.3 Complete installation of stormwater controls by the time each phase of construction activities has begun.

a. By the time construction activity in any given portion of the site begins, install and make operational any downgradient sediment controls (*e.g., buffers, perimeter controls, exit point controls, storm drain inlet protection*) that control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities.[12]

b. Following the installation of these initial controls, install and make operational all stormwater controls needed to control discharges prior to subsequent earth-disturbing activities.

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[10] For each of the effluent limits in Part 2, as applicable to your site, you must include in your SWPPP (1) a description of the specific control(s) to be implemented to meet the effluent limit; (2) any applicable design specifications; (3) routine maintenance specifications; and (4) the projected schedule for its (their) installation/implementation. See Part 7.2.6.

[11] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practices and must be explained in your SWPPP. You must also comply with any additional design and installation requirements specified for the effluent limits in Parts 2.2 and 2.3.

[12] Note that the requirement to install stormwater controls prior to each phase of construction activities for the site does not apply to the earth disturbance associated with the actual installation of these controls. Operators should take all reasonable actions to minimize the discharges of pollutants during the installation of stormwater controls.

2.1.4 Ensure that all stormwater controls are maintained and remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

a. Comply with any specific maintenance requirements for the stormwater controls listed in this permit, as well as any recommended by the manufacturer.[13]

b. If at any time you find that a stormwater control needs routine maintenance, you must immediately initiate the needed maintenance work, and complete such work by the close of the next business day.

c. If at any time you find that a stormwater control needs repair or replacement, you must comply with the corrective action requirements in Part 5.

2.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

You must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities.

2.2.1 Provide and maintain natural buffers and/or equivalent erosion and sediment controls when a water of the U.S. is located within 50 feet of the site's earth disturbances.

a. **Compliance Alternatives.** For any discharges to waters of the U.S. located within 50 feet of your site's earth disturbances, you must comply with one of the following alternatives:

    i. Provide and maintain a 50-foot undisturbed natural buffer; or

    ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

    iii. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

    See Appendix G, Part G.2 for additional conditions applicable to each compliance alternative.

b. **Exceptions.** See Appendix G, Part G.2 for exceptions to the compliance alternatives.

2.2.2 Direct stormwater to vegetated areas and maximize stormwater infiltration and filtering to reduce pollutant discharges, unless infeasible.

2.2.3 Install sediment controls along any perimeter areas of the site that will receive pollutant discharges.[14]

a. Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control.

b. **Exception**. For areas at "linear construction sites" (as defined in Appendix A) where perimeter controls are infeasible *(e.g., due to a limited or restricted right-of-way),*

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[13] Any departures from such maintenance recommendations made by the manufacturer must reflect good engineering practices and must be explained in your SWPPP.

[14] Examples of perimeter controls include filter berms, silt fences, vegetative strips, and temporary diversion dikes.

implement other practices as necessary to minimize pollutant discharges to perimeter areas of the site.

2.2.4 Minimize sediment track-out.

a. **Restrict vehicle use to properly designated exit points;**

b. Use appropriate stabilization techniques[15] at all points that exit onto paved roads.

   i. **Exception**: Stabilization is not required for exit points at linear utility construction sites that are used only episodically and for very short durations over the life of the project, provided other exit point controls[16] are implemented to minimize sediment track-out;

c. Implement additional track-out controls[17] as necessary to ensure that sediment removal occurs prior to vehicle exit; and

d. Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance, storm drain inlet, or water of the U.S.[18]

2.2.5 Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil:

a. Locate the piles outside of any natural buffers established under Part 2.2.1 and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;

b. Install a sediment barrier along all downgradient perimeter areas;[19]

c. For piles that will be unused for 14 or more days, provide cover[20] or appropriate temporary stabilization (consistent with Part 2.2.14);

d. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the U.S.

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[15] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, and turf mats.

[16] Examples of other exit point controls include preventing the use of exit points during wet periods; minimizing exit point use by keeping vehicles on site to the extent possible; limiting exit point size to the width needed for vehicle and equipment usage; using scarifying and compaction techniques on the soil; and avoiding establishing exit points in environmentally sensitive areas (*e.g., karst areas; steep slopes)*.

[17] Examples of additional track-out controls include the use of wheel washing, rumble strips, and rattle plates.

[18] Fine grains that remain visible *(i.e., staining)* on the surfaces of off-site streets, other paved areas, and sidewalks after you have implemented sediment removal practices are not a violation of Part 2.2.4.

[19] Examples of sediment barriers include berms, dikes, fiber rolls, silt fences, sandbags, gravel bags, or straw bale.

[20] Examples of cover include tarps, blown straw and hydroseeding.

2.2.6 Minimize dust. On areas of exposed soil, minimize the generation of dust through the appropriate application of water or other dust suppression techniques.

2.2.7 Minimize steep slope disturbances. Minimize the disturbance of "steep slopes" (as defined in Appendix A).

2.2.8 Preserve native topsoil, unless infeasible.[21]

2.2.9 Minimize soil compaction.[22] In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed:

a. Restrict vehicle and equipment use in these locations to avoid soil compaction; and

b. Before seeding or planting areas of exposed soil that have been compacted, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth.

2.2.10 Protect storm drain inlets.

a. Install inlet protection measures that remove sediment from discharges prior to entry into any storm drain inlet that carries stormwater flow from your site to a water of the U.S., provided you have authority to access the storm drain inlet;[23] and

b. Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

2.2.11 Minimize erosion of stormwater conveyance channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters. Use erosion controls and velocity dissipation devices[24] within and along the length of any stormwater conveyance channel and at any outlet to slow down runoff to minimize erosion.

2.2.12 If you install a sediment basin or similar impoundment:

a. Situate the basin or impoundment outside of any water of the U.S. and any natural buffers established under Part 2.2.1;

b. Design the basin or impoundment to avoid collecting water from wetlands;

c. Design the basin or impoundment to provide storage for either:

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[21] Stockpiling topsoil at off-site locations, or transferring topsoil to other locations, is an example of a practice that is consistent with the requirements in Part 2.2.8. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed. For example, some sites may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain, or may not have space to stockpile native topsoil on site for later use, in which case, it may not be feasible to preserve topsoil.

[22] Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

[23] Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

[24] Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

ii. The calculated volume of runoff from a 2-year, 24-hour storm (see Appendix H); or

iii. 3,600 cubic feet per acre drained.

d. Utilize outlet structures that withdraw water from the surface of the sediment basin or similar impoundment, unless infeasible;[25]

e. Use erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets; and

f. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

2.2.13 If using treatment chemicals (*e.g., polymers, flocculants, coagulants*):

a. **Use conventional erosion and sediment controls before and after the application of treatment chemicals.** Chemicals may only be applied where treated stormwater is directed to a sediment control *(e.g., sediment basin, perimeter control)* before discharge.

b. **Select appropriate treatment chemicals**. Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated *(i.e., the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area)*.

c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(e.g., spill berms, decks, spill containment pallets)*, or provide equivalent measures designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(e.g., storing chemicals in a covered area, having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill)*.

d. **Comply with state/local requirements.** Comply with applicable state and local requirements regarding the use of treatment chemicals.

e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** Use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

f. **Ensure proper training.** Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

g. **Perform additional measures specified by the EPA Regional Office for the authorized use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.1.9, you must perform all additional measures as

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[25] The circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where using surface outlets may not be feasible during certain time periods (although they must be used during other periods). If you determine that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination, including the specific conditions or time periods when this exception will apply.

conditioned by your authorization to ensure that the use of such chemicals will not cause an exceedance of water quality standards.

2.2.14 Stabilize exposed portions of the site. Implement and maintain stabilization measures (e.g., seeding protected by erosion controls until vegetation is established, sodding, mulching, erosion control blankets, hydromulch, gravel) that minimize erosion from exposed portions of the site in accordance with Parts 2.2.14a and 2.2.14b.

a. **Stabilization Deadlines:**[26]

Total Amount of Land Disturbance Occurring At Any One Time[27]	**Deadline**
i. **Five acres or less (≤5.0)** **Note: this includes sites disturbing more than five acres (>5.0) total over the course of a project, but that limit disturbance at any one time *(i.e., phase the disturbance)* to five acres or less (≤5.0)**	• Initiate the installation of stabilization measures immediately[28] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[29] and • Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days after stabilization has been initiated.[30]

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[26] EPA may determine, based on an inspection carried out under Part 4.8 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[27] Limiting disturbances to five (5) acres or less at any one time means that at no time during the project do the cumulative earth disturbances exceed five (5) acres. The following examples would qualify as limiting disturbances at any one time to five (5) acres or less:
1. The total area of disturbance for a project is five (5) acres or less.
2. The total area of disturbance for a project will exceed five (5) acres, but the operator ensures that no more than five (5) acres will be disturbed at any one time through implementation of stabilization measures. In this way, site stabilization can be used to "free up" land that can be disturbed without exceeding the five (5)-acre cap to qualify for the 14-day stabilization deadline. For instance, if an operator completes stabilization of two (2) acres of land on a five (5)-acre disturbance, then two (2) additional acres could be disturbed while still qualifying for the longer 14-day stabilization deadline.

[28] The following are examples of activities that would constitute the immediate initiation of stabilization:
1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable, but no later than one (1) calendar day of completing soil preparation;
2. Applying mulch or other non-vegetative product to the exposed area;
3. Seeding or planting the exposed area;
4. Starting any of the activities in # 1 – 3 on a portion of the entire area that will be stabilized; and
5. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

[29] The requirement to initiate stabilization immediately is triggered as soon as you know that construction work on a portion of the site is temporarily ceased and will not resume for 14 or more days, or as soon as you know that construction work is permanently ceased. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next business day, following the day when the construction activities have temporarily or permanently ceased.

[30] If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed. If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied.

Total Amount of Land Disturbance Occurring At Any One Time[27]	**Deadline**
ii. **More than five acres (>5.0)**	• Initiate the installation of stabilization measures immediately[31] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[32] and • Complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.[33]

iii. **Exceptions:**

(a) Arid, semi-arid, and drought-stricken areas (as defined in Appendix A)**.** If it is the seasonally dry period or a period in which drought is occurring, and vegetative stabilization measures are being used:

(i) Immediately initiate and, within 14 calendar days of a temporary or permanent cessation of work in any portion of your site, complete the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

(ii) As soon as practicable, given conditions or circumstances on the site, complete all activities necessary to seed or plant the area to be stabilized; and

(iii) If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. Also include the schedule you will follow for initiating and completing vegetative stabilization.

(b) Operators that are affected by unforeseen circumstances[34] that delay the initiation and/or completion of vegetative stabilization:

(i) Immediately initiate and, within 14 calendar days, complete the installation of temporary non-vegetative stabilization measures to prevent erosion;

(ii) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

(iii) Document in the SWPPP the circumstances that prevent you from meeting the deadlines in Part 2.2.14a and the schedule you will follow for initiating and completing stabilization.

(c) Discharges to a sediment- or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. Complete stabilization as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.

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[31] See footnote 27

[32] See footnote 28

[33] See footnote 29

[34] Examples include problems with the supply of seed stock or with the availability of specialized equipment and unsuitability of soil conditions due to excessive precipitation and/or flooding.

b. **Final Stabilization Criteria** (for any areas not covered by permanent structures)**:**

  i. Establish uniform, perennial vegetation *(i.e., evenly distributed, without large bare areas)* that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas; and/or

  ii. Implement permanent non-vegetative stabilization measures[35] to provide effective cover.

  iii. **Exceptions:**

    (a) **Arid, semi-arid, and drought-stricken areas** (as defined in Appendix A). Final stabilization is met if the area has been seeded or planted to establish vegetation that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas within three (3) years and, to the extent necessary to prevent erosion on the seeded or planted area, non-vegetative erosion controls have been applied that provide cover for at least three years without active maintenance.

    (b) **Disturbed areas on agricultural land that are restored to their preconstruction agricultural use.** The Part 2.2.14b final stabilization criteria does not apply.

    (c) **Areas that need to remain disturbed.** In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed, and only the minimum area needed remains disturbed *(e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, materials)*.

2.3 POLLUTION PREVENTION REQUIREMENTS[36]

You must implement pollution prevention controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater and to prevent the discharge of pollutants from spilled or leaked materials from construction activities.

2.3.1 For equipment and vehicle fueling and maintenance:

a. Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities;[37]

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[35] Examples of permanent non-vegetative stabilization measures include riprap, gravel, gabions, and geotextiles.

[36] Under this permit, you are not required to minimize exposure for any products or materials where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

[37] Examples of effective means include:

- Locating activities away from waters of the U.S. and stormwater inlets or conveyances so that stormwater coming into contact with these activities cannot reach waters of the U.S.;
- Providing secondary containment (*e.g., spill berms, decks, spill containment pallets*) and cover where appropriate; and
- Having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill.

b. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR part 112 and Section 311 of the CWA;

c. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

d. Use drip pans and absorbents under or around leaky vehicles;

e. Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements; and

f. Clean up spills or contaminated surfaces immediately, using dry clean up measures (do not clean contaminated surfaces by hosing the area down), and eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

2.3.2 For equipment and vehicle washing:

a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters;[38]

b. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water; and

c. For storage of soaps, detergents, or solvents, provide either (1) cover *(e.g., plastic sheeting, temporary roofs)* to minimize the exposure of these detergents to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

2.3.3 For storage, handling, and disposal of building products, materials, and wastes:

a. *For building materials and building products*[39], provide either (1) cover (*e.g., plastic sheeting, temporary roofs*) to minimize the exposure of these products to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*

   i. In storage areas, provide either (1) cover (*e.g., plastic sheeting, temporary roofs*) to minimize the exposure of these chemicals to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas; and

   ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label (see also Part 2.3.5).

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals*:

   i. Store chemicals in water-tight containers, and provide either (1) cover *(e.g., plastic sheeting, temporary roofs)* to minimize the exposure of these containers to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas *(e.g., having a spill kit available on site and ensuring personnel are available to respond expeditiously in*

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[38] Examples of effective means include locating activities away from waters of the U.S. and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

[39] Examples of building materials and building products typically present at construction sites include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.

the event of a leak or spill), or provide secondary containment *(e.g., spill berms, decks, spill containment pallets)*; and

- ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

d. *For hazardous or toxic wastes*:[40]

- i. Separate hazardous or toxic waste from construction and domestic waste;
- ii. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;
- iii. Store all outside containers within appropriately-sized secondary containment (*e.g., spill berms, decks, spill containment pallets*) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(e.g., storing chemicals in a covered area, having a spill kit available on site);*
- iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements;
- v. Clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and
- vi. Follow all other federal, state, tribal, and local requirements regarding hazardous or toxic waste.

e. *For construction and domestic wastes*:[41]

- i. Provide waste containers *(e.g., dumpster, trash receptacle)* of sufficient size and number to contain construction and domestic wastes;
- ii. Keep waste container lids closed when not in use and close lids at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either (1) cover *(e.g., a tarp, plastic sheeting, temporary roof)* to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants *(e.g., secondary containment)*;
- iii. On business days, clean up and dispose of waste in designated waste containers; and
- iv. Clean up immediately if containers overflow.

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[40] Examples of hazardous or toxic waste that may be present at construction sites include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

[41] Examples of construction and domestic waste include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris; and other trash or building materials.

f. *For sanitary waste*, position portable toilets so that they are secure and will not be tipped or knocked over, and located away from waters of the U.S. and stormwater inlets or conveyances.

2.3.4 For washing applicators and containers used for stucco, paint, concrete, form release oils, curing compounds, or other materials:

a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so that no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

   i. Do not dump liquid wastes in storm sewers or waters of the U.S.;

   ii. Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3; and

   iii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3; and

c. Locate any washout or cleanout activities as far away as possible from waters of the U.S. and stormwater inlets or conveyances, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.5 For the application of fertilizers:

a. Apply at a rate and in amounts consistent with manufacturer's specifications, or document in the SWPPP departures from the manufacturer specifications where appropriate in accordance with Part 7.2.6.b.ix;

b. Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

c. Avoid applying before heavy rains that could cause excess nutrients to be discharged;

d. Never apply to frozen ground;

e. Never apply to stormwater conveyance channels; and

f. Follow all other federal, state, tribal, and local requirements regarding fertilizer application.

2.3.6 Emergency Spill Notification Requirements

Discharges of toxic or hazardous substances from a spill or other release are prohibited, consistent with Part 1.3.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 as soon as you have knowledge of the release. You must also, within seven (7) calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.4 CONSTRUCTION DEWATERING REQUIREMENTS

Comply with the following requirements to minimize the discharge of pollutants in ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, in accordance with Part 1.2.2.[42]

2.4.1 Treat dewatering discharges with controls to minimize discharges of pollutants;[43]

2.4.2 Do not discharge visible floating solids or foam;

2.4.3 Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials;

2.4.4 To the extent feasible, use vegetated, upland areas of the site to infiltrate dewatering water before discharge. You are prohibited from using waters of the U.S. as part of the treatment area;

2.4.5 At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11;

2.4.6 With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and

2.4.7 Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

3 WATER QUALITY-BASED EFFLUENT LIMITATIONS

3.1 GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Discharges must be controlled as necessary to meet applicable water quality standards. Discharges must also comply with any additional state or tribal requirements that are in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that discharges are not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Parts 5.1 and 5.2, and document the corrective actions as required in Part 5.4.

EPA may insist that you install additional controls (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality

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[42] Uncontaminated, clear (non-turbid) dewatering water can be discharged without being routed to a control.

[43] Appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (*e.g., bag or sand filters*), and passive treatment systems that are designed to remove sediment. Appropriate controls to use downstream of dewatering controls to minimize erosion include vegetated buffers, check dams, riprap, and grouted riprap at outlets.

standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA-established or approved TMDL.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of your coverage under this permit.

3.2 DISCHARGE LIMITATIONS FOR SITES DISCHARGING TO SENSITIVE WATERS[44]

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes, you must comply with the inspection frequency specified in 4.3 and you must comply with the stabilization deadline specified in Part 2.2.14.a.iii.(c).[45]

If you discharge to a water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional controls are necessary for your discharge to be controlled as necessary to meet water quality standards, including for it to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL, or if coverage under an individual permit is necessary.

In addition, on a case-by-case basis, EPA may notify operators of new sites or operators of existing sites with increased discharges that additional analyses, stormwater controls, or other measures are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary.

If you discharge to a water that is impaired for polychlorinated biphenyls (PCBs) and are engaging in demolition of any structure with at least 10,000 square feet of floor space built or renovated before January 1, 1980, you must:

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[44] Sensitive waters include waters that are impaired and Tier 2, Tier 2.5, and Tier 3 waters.

"Impaired waters" are those waters identified by the state, tribe, or EPA as not meeting an applicable water quality standard and (1) requires development of a TMDL (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1). Your construction site will be considered to discharge to an impaired water if the first water of the U.S. to which you discharge is an impaired water for the pollutants contained in the discharge from your site. For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. For assistance in determining whether your site discharges to impaired waters, EPA has developed a tool that is available both within the electronic NOI form in NeT, and at https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools.

Tiers 2, 2.5 and 3 refer to waters either identified by the state as high quality waters or Outstanding National Resource Waters under 40 CFR 131.12(a)(2) and (3). For the purposes of this permit, you are considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3. For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

EPA may determine on a case-by-case basis that a site discharges to a sensitive water.

[45] If you qualify for any of the reduced inspection frequencies in Part 4.4, you may conduct inspections in accordance with Part 4.4 for any portion of your site that discharges to a sensitive water.

a. Implement controls[46] to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, to precipitation and to stormwater; and

b. Ensure that disposal of such materials is performed in compliance with applicable state, federal, and local laws.

4 SITE INSPECTION REQUIREMENTS

4.1 PERSON(S) RESPONSIBLE FOR INSPECTING SITE

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that the person who conducts inspections is a "qualified person."[47]

4.2 FREQUENCY OF INSPECTIONS.[48]

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to the Part 4.3 site inspection frequency for discharges to sensitive waters or qualify for a Part 4.4 reduction in the inspection frequency:

4.2.1 At least once every seven (7) calendar days; *or*

4.2.2 Once every 14 calendar days *and* within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge.[49] To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.3 INCREASE IN INSPECTION FREQUENCY FOR SITES DISCHARGING TO SENSITIVE WATERS.

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.2), instead of the inspection frequency specified in

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[46] Examples of controls to minimize exposure of PCBs to precipitation and stormwater include separating work areas from non-work areas and selecting appropriate personal protective equipment and tools, constructing a containment area so that all dust or debris generated by the work remains within the protected area, using tools that minimize dust and heat (<212°F). For additional information, refer to Part 2.3.3 of the CGP Fact Sheet.

[47] A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

[48] Inspections are only required during the site's normal working hours.

[49] "Within 24 hours of the occurrence of a storm event" means that you must conduct an inspection within 24 hours once a storm event has produced 0.25 inches within a 24-hour period, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly in accordance with Part 4.2.2 and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you must conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

Part 4.2, you must conduct inspections in accordance with the following inspection frequencies:

Once every seven (7) calendar days *and* within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.4 REDUCTIONS IN INSPECTION FREQUENCY

4.4.1 Stabilized areas.

a. You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month in any area of your site where the stabilization steps in 2.2.14a have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable. You must document the beginning and ending dates of this period in your SWPPP.

b. **Exception.** For "linear construction sites" (as defined in Appendix A) where disturbed portions have undergone final stabilization at the same time active construction continues on others, you may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, in any area of your site where the stabilization steps in 2.2.14a have been completed. After the first month, inspect once more within 24 hours of the occurrence of a storm event of 0.25 inches or greater. If there are no issues or evidence of stabilization problems, you may suspend further inspections. If "wash-out" of stabilization materials and/or sediment is observed, following re-stabilization, inspections must resume at the inspection frequency required in Part 4.4.1a Inspections must continue until final stabilization is visually confirmed following a storm event of 0.25 inches or greater.

4.4.2 Arid, semi-arid, or drought-stricken areas (as defined in Appendix A). If it is the seasonally dry period or a period in which drought is occurring, you may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.4.3 Frozen conditions:

a. If you are suspending construction activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (as defined in Appendix A) begin to occur if:

   1. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable;
   2. Land disturbances have been suspended; and
   3. All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

b. If you are still conducting construction activities during frozen conditions, you may reduce your inspection frequency to once per month if:
   i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable; and
   ii. Except for areas in which you are actively conducting construction activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

You must document the beginning and ending dates of this period in your SWPPP.

4.5 AREAS THAT MUST BE INSPECTED

During your site inspection, you must at a minimum inspect the following areas of your site:

4.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2.14a;

4.5.2 All stormwater controls (including pollution prevention controls) installed at the site to comply with this permit;[50]

4.5.3 Material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit;

4.5.4 All areas where stormwater typically flows within the site, including drainageways designed to divert, convey, and/or treat stormwater;

4.5.5 All points of discharge from the site; and

4.5.6 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.6 REQUIREMENTS FOR INSPECTIONS

During your site inspection, you must at a minimum:

4.6.1 Check whether all stormwater controls *(i.e., erosion and sediment controls and pollution prevention controls)* are properly installed, appear to be operational, and are working as intended to minimize pollutant discharges;

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[50] This includes the requirement to inspect for sediment that has been tracked out from the site onto paved roads, sidewalks, or other paved areas consistent with Part 2.2.4.

4.6.2 Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;

4.6.3 Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3;

4.6.4 Check for signs of visible erosion and sedimentation *(i.e., sediment deposits)* that have occurred and are attributable to your discharge at points of discharge and, if applicable, the banks of any waters of the U.S. flowing within or immediately adjacent to the site;

4.6.5 Identify any incidents of noncompliance observed;

4.6.6 If a discharge is occurring during your inspection:

a. Identify all discharge points at the site; and

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.

4.6.7 Based on the results of your inspection, complete any necessary maintenance under Part 2.1.4 and corrective action under Part 5.

4.7 INSPECTION REPORT

4.7.1 You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.6, including any necessary maintenance or corrective actions;

d. If you are inspecting your site at the frequency specified in Part 4.2.2, Part 4.3, or Part 4.4.1b, and you conducted an inspection because of rainfall measuring 0.25 inches or greater, you must include the applicable rain gauge or weather station readings that triggered the inspection; and

e. If you determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations to which this condition applies.

4.7.2 Each inspection report must be signed in accordance with Appendix I, Part I.11 of this permit.

4.7.3 You must keep a copy of all inspection reports at the site or at an easily accessible location, so that it can be made available at the time of an on-site inspection or upon request by EPA.

4.7.4 You must retain all inspection reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

4.8 INSPECTIONS BY EPA

You must allow EPA, or an authorized representative of EPA, to conduct the following activities at reasonable times. To the extent that you are utilizing shared controls that are not on site to comply with this permit, you must make arrangements for EPA to have access at all reasonable times to those areas where the shared controls are located.

4.8.1 Enter onto all areas of the site, including any construction support activity areas covered by this permit, any off-site areas where shared controls are utilized to comply with this permit, discharge locations, adjoining waterbodies, and locations where records are kept under the conditions of this permit;

4.8.2 Access and copy any records that must be kept under the conditions of this permit;

4.8.3 Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.2.1c), any stormwater controls installed and maintained at the site, and any off-site shared controls utilized to comply with this permit; and

4.8.4 Sample or monitor for the purpose of ensuring compliance.

5 CORRECTIVE ACTIONS

5.1 CONDITIONS TRIGGERING CORRECTIVE ACTION.

You must take corrective action to address any of the following conditions identified at your site:

5.1.1 A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); or

5.1.2 A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or

5.1.3 Your discharges are causing an exceedance of applicable water quality standards; or

5.1.4 A prohibited discharge has occurred (see Part 1.3).

5.2 CORRECTIVE ACTION DEADLINES

For any corrective action triggering conditions in Part 5.1, you must:

5.2.1 Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events;

5.2.2 When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day;

5.2.3 When the problem requires a new or replacement control or significant repair, install the new or modified control and make it operational, or complete the repair, by no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as feasible after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven (7) calendar days of completing this work.

5.3 CORRECTIVE ACTION REQUIRED BY EPA

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.8.

5.4 CORRECTIVE ACTION REPORT

For each corrective action taken in accordance with this Part, you must complete a report in accordance with the following:

5.4.1 Within 24 hours of identifying the corrective action condition, document the specific condition and the date and time it was identified.

5.4.2 Within 24 hours of completing the corrective action (in accordance with the deadlines in Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.

5.4.3 Each corrective action report must be signed in accordance with Appendix I, Part I.11 of this permit.

5.4.4 You must keep a copy of all corrective action reports at the site or at an easily accessible location, so that it can be made available at the time of an on-site inspection or upon request by EPA.

5.4.5 You must retain all corrective action reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

6 STAFF TRAINING REQUIREMENTS

Each operator, or group of multiple operators, must assemble a “stormwater team” to carry out compliance activities associated with the requirements in this permit.

6.1 Prior to the commencement of construction activities, you must ensure that the following personnel[51] on the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements:

a. Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention controls);

b. Personnel responsible for the application and storage of treatment chemicals (if applicable);

c. Personnel who are responsible for conducting inspections as required in Part 4.1; and

d. Personnel who are responsible for taking corrective actions as required in Part 5.

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[51] If the person requiring training is a new employee who starts after you commence construction activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit.

For emergency-related projects, the requirement to train personnel prior to commencement of construction activities does not apply, however, such personnel must have the required training prior to NOI submission.

6.2 You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers, but you must ensure that such personnel understand any requirements of this permit that may be affected by the work they are subcontracted to perform.

6.3 At a minimum, members of the stormwater team must be trained to understand the following if related to the scope of their job duties *(e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections*):

a. The permit deadlines associated with installation, maintenance, and removal of stormwater controls and with stabilization**;**

b. The location of all stormwater controls on the site required by this permit and how they are to be maintained;

c. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

d. When and how to conduct inspections, record applicable findings, and take corrective actions.

6.4 Each member of the stormwater team must have easy access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

7.1 GENERAL REQUIREMENTS

All operators associated with a construction site under this permit must develop a SWPPP consistent with the requirements in Part 7 prior to their submittal of the NOI.[52, 53] The SWPPP must be kept up-to-date throughout coverage under this permit.

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[52] The SWPPP does not establish the effluent limits that apply to your site's discharges; these limits are established in this permit in Parts 2 and 3.

[53] You have the option of developing a group SWPPP where you are one of several operators at your site. For instance, if both the owner and the general contractor of the construction site are operators and thus are both required to obtain a permit, the owner may be the party undertaking SWPPP development, and the general contractor (or any other operator at the site) can choose to use this same SWPPP, as long as the SWPPP addresses the general contractor's (or other operator's) scope of construction work and functions to be performed under the SWPPP. Regardless of whether there is a group SWPPP or several individual SWPPPs, all operators would be jointly and severally liable for compliance with the permit.

Where there are multiple operators associated with the same site through a common plan of development or sale, operators may assign to themselves various permit-related functions under the SWPPP provided that each SWPPP, or a group SWPPP, documents which operator will perform each function under the SWPPP. However, dividing the functions to be performed under each SWPPP, or a single group SWPPP, does not relieve an individual operator from liability for complying with the permit should another operator fail to implement any measures that are necessary for that individual operator to comply with the permit, e.g., the installation and maintenance of any shared controls. In addition, all operators must ensure, either directly or through coordination with other operators, that their activities do not cause a violation and/or render any other operators' controls and/or any shared controls ineffective. All operators who rely on a shared control to comply with the permit are jointly and severally liable for violations of the permit resulting from the failure to properly install, operate and/or maintain the shared control.

If a SWPPP was prepared under a previous version of this permit, the operator must review and update the SWPPP to ensure that this permit's requirements are addressed prior to submitting an NOI for coverage under this permit.

7.2 SWPPP CONTENTS

At a minimum, the SWPPP must include the information specified in this Part and as specified in other parts of this permit.

7.2.1 **All Site Operators.** Include a list of all other operators who will be engaged in construction activities at the site, and the areas of the site over which each operator has control.

7.2.2 **Stormwater Team.** Identify the personnel (by name or position) that are part of the stormwater team, as well as their individual responsibilities, including which members are responsible for conducting inspections.

7.2.3 **Nature of Construction Activities.**[54] Include the following:

a. A description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition;

b. The size of the property (in acres or length in miles if a linear construction site);

c. The total area expected to be disturbed by the construction activities (to the nearest quarter acre or nearest quarter mile if a linear construction site);

d. A description of any on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c);

e. The maximum area expected to be disturbed at any one time, including on-site and off-site construction support activity areas;

f. A description and projected schedule for the following:

   i. Commencement of construction activities in each portion of the site, including clearing and grubbing, mass grading, demolition activities, site preparation (*i.e., excavating, cutting and filling*), final grading, and creation of soil and vegetation stockpiles requiring stabilization;

   ii. Temporary or permanent cessation of construction activities in each portion of the site;

   iii. Temporary or final stabilization of exposed areas for each portion of the site; and

   iv. Removal of temporary stormwater controls and construction equipment or vehicles, and the cessation of construction-related pollutant-generating activities.

g. A list and description of all pollutant-generating activities[55] on the site. For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents (*e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels*) associated with that activity, which could be discharged in stormwater from your construction site. You must take

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[54] If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to "lock in" the operator to meeting these dates. When departures from initial projections are necessary, this should be documented in the SWPPP itself, or in associated records, as appropriate.

[55] Examples of pollutant-generating activities include paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations.

into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed or removed during construction;

h. Business days and hours for the project;

i. If you are conducting construction activities in response to a public emergency (see Part 1.4), a description of the cause of the public emergency *(e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, information substantiating its occurrence *(e.g., state disaster declaration or similar state or local declaration)*, and a description of the construction necessary to reestablish affected public services.

7.2.4 **Site Map.** Include a legible map, or series of maps, showing the following features of the site:

a. Boundaries of the property;

b. Locations where construction activities will occur, including:
   - i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;
   - ii. Approximate slopes before and after major grading activities (note any steep slopes (as defined in Appendix A));
   - iii. Locations where sediment, soil, or other construction materials will be stockpiled;
   - iv. Any water of the U.S. crossings;
   - v. Designated points where vehicles will exit onto paved roads;
   - vi. Locations of structures and other impervious surfaces upon completion of construction; and
   - vii. Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c).

c. Locations of all waters of the U.S. within and one mile downstream of the site's discharge point. Also identify if any are listed as impaired, or are identified as a Tier 2, Tier 2.5, or Tier 3 water;

d. Areas of federally listed critical habitat within the site and/or at discharge locations;

e. Type and extent of pre-construction cover on the site (*e.g., vegetative cover, forest, pasture, pavement, structures*);

f. Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities;

g. Stormwater and authorized non-stormwater discharge locations, including:
   - i. Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets;[56] and
   - ii. Locations where stormwater or authorized non-stormwater will be discharged directly to waters of the U.S.

h. Locations of all potential pollutant-generating activities identified in Part 7.2.3g;

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[56] The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

i. Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit; and

j. Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.5 Non-Stormwater Discharges. Identify all authorized non-stormwater discharges in Part 1.2.2 that will or may occur.

7.2.6 Description of Stormwater Controls.

a. For each of the Part 2.2 erosion and sediment control effluent limits, Part 2.3 pollution prevention effluent limits, and Part 2.4 construction dewatering effluent limits, as applicable to your site, you must include the following:

   i. A description of the specific control(s) to be implemented to meet the effluent limit;

   ii. Any applicable stormwater control design specifications (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon);[57]

   iii. Routine stormwater control maintenance specifications; and

   iv. The projected schedule for stormwater control installation/implementation.

b. You must also include any of the following additional information as applicable.

   i. **Natural buffers and/or equivalent sediment controls** (see Part 2.2.1 and Appendix G). You must include the following:

      (a) The compliance alternative to be implemented;

      (b) If complying with alternative 2, the width of natural buffer retained;

      (c) If complying with alternative 2 or 3, the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency;

      (d) If complying with alternative 3, a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size;

      (e) For "linear construction sites" where it is infeasible to implement compliance alternative 1, 2, or 3, a rationale for this determination, and a description of any buffer width retained and/or supplemental erosion and sediment controls installed; and

      (f) A description of any disturbances that are exempt under Part 2.2.1 that occur within 50 feet of a water of the U.S.

   ii. **Perimeter controls for a "linear construction site"** (see Part 2.2.3). For areas where perimeter controls are not feasible, include documentation to support this determination and a description of the other practices that will be implemented to minimize discharges of pollutants in stormwater associated with construction activities.

   Note: Routine maintenance specifications for perimeter controls documented in the SWPPP must include the Part 2.2.3a requirement that sediment be removed

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[57] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

before it has accumulated to one-half of the above-ground height of any perimeter control.

iii. **Sediment track-out controls** (see Parts 2.2.4b and 2.2.4c)**.** Document the specific stabilization techniques and/or controls that will be implemented to remove sediment prior to vehicle exit.

iv. **Sediment basins** (see Part 2.2.12). In circumstances where it is infeasible to utilize outlet structures that withdraw water from the surface, include documentation to support this determination, including the specific conditions or time periods when this exception will apply.

v. **Treatment chemicals** (see Part 2.2.13), you must include the following:

  (a) A listing of the soil types that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction;

  (b) A listing of all treatment chemicals to be used at the site and why the selection of these chemicals is suited to the soil characteristics of your site;

  (c) If the applicable EPA Regional Office authorized you to use cationic treatment chemicals for sediment control, include the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to an exceedance of water quality standards;

  (d) The dosage of all treatment chemicals to be used at the site or the methodology to be used to determine dosage;

  (e) Information from any applicable Safety Data Sheet (SDS);

  (f) Schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

  (g) A description of how chemicals will be stored consistent with Part 2.2.13c;

  (h) References to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

  (i) A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

vi. **Stabilization measures** (see Part 2.2.14). You must include the following:

  (a) The specific vegetative and/or non-vegetative practices that will be used;

  (b) The stabilization deadline that will be met in accordance with Part 2.2.14.a.i-ii;

  (c) If complying with the deadlines for sites in arid, semi-arid, or drought-stricken areas, the beginning and ending dates of the seasonally dry period and the schedule you will follow for initiating and completing vegetative stabilization; and

  (d) If complying with deadlines for sites affected by unforeseen circumstances that delay the initiation and/or completion of vegetative stabilization, document the circumstances and the schedule for initiating and completing stabilization.

vii. **Spill prevention and response procedures** (see Part 1.3.5 and Part 2.3). You must include the following:

   (a) Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

   (b) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.6 and established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available to all employees.

   You may also reference the existence of Spill Prevention Control and Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan on site.[58]

viii. **Waste management procedures** (see Part 2.3.3). Describe the procedures you will follow for handling, storing and disposing of all wastes generated at your site consistent with all applicable federal, state, tribal, and local requirements, including clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

ix. **Application of fertilizers** (see Part 2.3.5). Document any departures from the manufacturer specifications where appropriate.

7.2.7 Procedures for Inspection, Maintenance, and Corrective Action. Describe the procedures you will follow for maintaining your stormwater controls, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.4, Part 4, and Part 5 of this permit. Also include:

a. The inspection schedule you will follow, which is based on whether your site is subject to Part 4.2 or Part 4.3, or whether your site qualifies for any of the reduced inspection frequencies in Part 4.4;

b. If you will be conducting inspections in accordance with the inspection schedule in Part 4.2.2, Part 4.3, or Part 4.4.1b, the location of the rain gauge or the address of the weather station you will be using to obtain rainfall data;

c. If you will be reducing your inspection frequency in accordance with Part 4.4.1b, the beginning and ending dates of the seasonally defined arid period for your area or the valid period of drought;

d. If you will be reducing your inspection frequency in accordance with Part 4.4.3, the beginning and ending dates of frozen conditions on your site; and

e. Any maintenance or inspection checklists or other forms that will be used.

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[58] Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

7.2.8 **Staff Training.** Include documentation that the required personnel were, or will be, trained in accordance with Part 6.

7.2.9 **Compliance with Other Requirements.**

a. **Threatened and Endangered Species Protection.** Include documentation required in Appendix D supporting your eligibility with regard to the protection of threatened and endangered species and designated critical habitat.

b. **Historic Properties.** Include documentation required in Appendix E supporting your eligibility with regard to the protection of historic properties.

c. **Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.** If you are using any of the following stormwater controls at your site, document any contact you have had with the applicable state agency[59] or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR 144 -147. Such controls would generally be considered Class V UIC wells:

   i. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

   ii. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

   iii. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

7.2.10 **SWPPP Certification.** You must sign and date your SWPPP in accordance with Appendix I, Part I.11.

7.2.11 **Post-Authorization Additions to the SWPPP.** Once you are authorized for coverage under this permit, you must include the following documents as part of your SWPPP:

a. A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

b. A copy of the acknowledgment letter you receive from NeT assigning your NPDES ID (*i.e., permit tracking number*);

c. A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3 ON-SITE AVAILABILITY OF YOUR SWPPP

You must keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a state, tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).

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[59] For state UIC program contacts, refer to the following EPA website: https://www.epa.gov/uic.

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.[60]

If an on-site location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4 SWPPP MODIFICATIONS

7.4.1 You must modify your SWPPP, including the site map(s), within seven (7) days of any of the following conditions:

a. Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3f change during the course of construction;

b. To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

c. If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;

d. Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet the requirements of this permit, the following must be included in your SWPPP:

   i. A copy of any correspondence describing such measures and requirements; and

   ii. A description of the controls that will be used to meet such requirements.

e. To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater controls implemented at the site; and

f. If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2 You must maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.10 above) and a brief summary of all changes.

7.4.3 All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix I, Part I.11.b.

7.4.4 Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

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[60] Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR Part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

8 HOW TO TERMINATE COVERAGE

Until you terminate coverage under this permit, you must comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1 MINIMUM INFORMATION REQUIRED IN NOT

8.1.1 NPDES ID (*i.e., permit tracking number)* provided by EPA when you received coverage under this permit;

8.1.2 Basis for submission of the NOT (see Part 8.2);

8.1.3 Operator contact information;

8.1.4 Name of site and address (or a description of location if no street address is available); and

8.1.5 **NOT certification.**

8.2 CONDITIONS FOR TERMINATING CGP COVERAGE

You must terminate CGP coverage only if one or more of the following conditions has occurred:

8.2.1 You have completed all construction activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.2.1c), and you have met the following requirements:

a. For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.14b;

b. You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

c. You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable; and

d. You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2 You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3 Coverage under an individual or alternative general NPDES permit has been obtained.

8.3 HOW TO SUBMIT YOUR NOT

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOT for the 2017 CGP.

To access NeT, go to https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting.

Waivers from electronic reporting may be granted as specified in Part 1.4.1. If the EPA Regional Office grants you approval to use a paper NOT, and you elect to use it, you must complete the form in Appendix K.

8.4 DEADLINE FOR SUBMITTING THE NOT

You must submit your NOT within 30 calendar days after any one of the conditions in Part 8.2 occurs.

8.5 EFFECTIVE DATE OF TERMINATION OF COVERAGE

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is submitted to EPA.

9 PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and areas in certain states subject to construction projects by Federal Operators. States, Indian country, and areas subject to construction by Federal Operators not included in this Part do not have any modifications or additions to the applicable conditions of this permit.

9.1 EPA REGION 1

9.1.1 NHR100000 State of New Hampshire

a. If you disturb 100,000 square feet or more of contiguous area, you must also apply for an Alteration of Terrain (AoT) permit from DES pursuant to RSA 485- A:17 and Env-Wq 1500. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Wq 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of any surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule.

b. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.2.2). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the groundwater dewatering location. Information on groundwater contamination can be generated over the Internet via the NHDES web site http://des.nh.gov/ by using the One Stop Data Mapper at http://des.nh.gov/onestop/gis.htm. If it is determined that the groundwater to be dewatered is near a remediation or other waste site you must apply for the Remediation General Permit (see https://www3.epa.gov/region1/npdes/rgp.html.)

c. You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at least once per week during weeks when discharges occur. Samples must be analyzed for total suspended solids (TSS) or turbidity and must meet monthly average and daily maximum limits of 50 milligrams per liter (mg/L) and 100 mg/L, respectively for TSS or 33 mg/l and 67 mg/l, respectively for turbidity. TSS (a.k.a. Residue, Nonfilterable) or turbidity sampling and analysis must be performed in accordance with Tables IB and II in 40 CFR 136.3 (http://www.ecfr.gov/cgi-bin/text-idx?SID=0243e3c4283cbd7d8257eb6afc7ce9a2&mc=true&node=se40.25.136_13&rgn=div8). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.

d. Construction site owners and operators must consider opportunities for post-construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the SWPPP. If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485- C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GAI or GA2 pursuant to RSA 485-C and Env-DW 901; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Wq 1507.04(e), including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.26). For design considerations for infiltration measures see Volume II of the NH Stormwater Manual.

e. Appendix F contains a list of Tier 2, or high quality waters. Although there is no official list of tier 2 waters, it can be assumed that all NH surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see Surface Water Quality - Watershed Report Cards at http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm) or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU. A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

f. To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown in Part 9.1.4 (g).

    i. A site map required in Part 7.2.4, showing the type and location of all post-construction infiltration BMPs utilized at the facility or the reason(s) why none were installed;

    ii. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.2.2).

iii. Records of sampling and analysis of TSS required for construction dewatering discharges (see Part 9.1.4 (c)).

g. All required or requested documents must be sent to:

NH Department of Environmental Services, Wastewater Engineering Bureau,
Permits & Compliance Section
P.O. Box 95
Concord, NH 03302-0095

9.2 EPA REGION 3

9.2.1 DCR100000 District of Columbia

a. The permittee must comply with the District of Columbia Water Pollution Control Act of 1984, as amended, (D.C. Official Code §8-103.01 *et seq.*) and its implementing regulations in Title 21, Chapters 11 and 19 of the District of Columbia Municipal Regulations. Nothing in this permit will be construed to preclude the institution of any legal action or relieve the permitee from any responsibilities, liabilities, or penalties established pursuant to District of Columbia laws and regulations.

b. The permittee must comply with the District of Columbia Stormwater Management, and Soil Erosion and Sediment Control in Chapter 5 of Title 21 of the District of Columbia Municipal Regulations.

c. The permittee must comply with the District of Columbia Flood Management control in Chapter 31 of Title 20 of the District of Columbia Municipal Regulations.

d. The Department may request a copy of the Stormwater Pollution Prevention Plan (SWPPP) and the permittee is required to submit the SWPPP to the Department with 14 days of such request. The Department may conduct an inspection of any facility covered by this permit to ensure compliance with District's law requirements including water quality.

9.2.2 DER10F000 Areas in the State of Delaware subject to construction by a Federal Operator

a. Federal agencies engaging in construction activities must submit, to DNREC, a sediment and stormwater management (S&S) plan and obtain approval from DNREC in accordance with 7 Del. C. §4010, 7 DE Admin. Code 5101, and 7 DE Admin. Code 7201.

b. Federal agencies engaging in construction activities must provide for construction review by a certified construction reviewer in accordance with 7 Del. C. §§4010 & 4013 and 7 DE Admin. Code 5101, subsection 6.1.6.

c. Federal agencies engaging in construction activities must certify that all responsible personnel involved in the construction project will have attended the blue card training prior to initiation of any land disturbing activity – *see* 7 Del. C. §§ 4002 & 4014 and 7 DE Admin. Code 5101.

9.3 EPA REGION 5

9.3.1 MNR10I000 Indian country within the State of Minnesota

9.3.1.1 Fond du Lac Band of Lake Superior Chippewa. The following conditions apply only to discharges on the Fond du Lac Band of Lake Superior Chippewa Reservation:

a. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the Office of Water Protection at least fifteen (15) days in advance of sending the Notice of Intent (NOI) to EPA. The SWPPP can be submitted electronically to richardgitar@FDLREZ.com or by hardcopy sent to:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

CGP applicants are encouraged to work with the FDL Office of Water Protection in the identification of all proposed receiving.

b. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA.

c. The turbidity limit shall NOT exceed 10% of natural background within the receiving water(s) as determined by Office of Water Protection staff.

d. Turbidity sampling must take place within 24 hours of a ½-inch or greater rainfall event. The results of the sampling must be reported to the Office of Water Protection within 7 days of the sample collection. All sample reporting must include the date and time, location (GPS: UTM/Zone 15), and NTU. CGP applicants are encouraged to work with the Office of Water Protection in determining the most appropriate location(s) for sampling.

e. Receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff. This requirement only applies to receiving waters in which no ambient turbidity data exists.

f. This Certification does not pertain to any new discharge to Outstanding Reservation Resource Waters (ORRW) as described in §105 b.3. of the Fond du Lac Water Quality Standards (Ordinance #12/98, as amended). Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake are designated as ORRWs. New dischargers wishing to discharge to an ORRW must obtain an individual permit from EPA for stormwater discharges from large and small construction activities.

g. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance 12/98, as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm water fisheries, cold water fisheries, subsistence fishing (netting), primary contact recreation, secondary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation, and commercial.

h. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management agency (National Response Center AND the State Duty Officer), and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac Reservation, including groundwater. The Fond du Lac Office of Water Protection must also be notified immediately of any spill regardless of size.

i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

9.3.1.2 Grand Portage Band of Lake Superior Chippewa. The following conditions apply only to discharges on the Grand Portage Band of Lake Superior Chippewa Reservation:

a. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the "Certification"). This Certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing as such.

b. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance). As such, appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation (as defined in the Water Resources Ordinance). All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.

c. The 2017 CGP requires inspections and monitoring reports of the construction site stormwater discharges by a qualified person. Monitoring and inspection reports must comply with the minimum requirements contained in the 2017 CGP. The monitoring plan must be prepared and incorporated into the Stormwater Pollution Prevention Plan (the "SWPPP"). A copy of the SWPPP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The SWPPP should be sent to:

Grand Portage Environmental Resources Board
P.O. Box 428
Grand Portage, MN 55605

Copies of the Notice of Intent and Notice of Termination required under the CGP must be submitted to the Board at the address above at the same time they are submitted to the EPA.

d. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards.

e. Discharges that the Board has determined to be or that may reasonably be expected to be contributing to a violation of Water Quality Standards or Applicable Federal Standards are not authorized by this Certification.

f. The Board retains full authority provided by the Water Resources Ordinance to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions.

g. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

9.3.2 WIR10I000 Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community

9.3.2.1 Bad River Band of Lake Superior Tribe of Chippewa Indians: The following conditions apply only to discharges on the Bad River Band of the Lake Superior Tribe of Chippewa Indians Reservation:

a. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, or historical sites, or properties that may be eligible for listing as such.[61, 62]

b. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (or Tier 3 water).[63] Outstanding Tribal Resource Waters, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.[64]

c. Projects utilizing cationic treatment chemicals[65] within the Bad River Reservation boundaries are not eligible for coverage under the CGP.[66]

d. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS).[67]

e. An operator proposing to discharge to an Outstanding Resource Water (or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Outstanding Resource Waters, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek.[68] The antidegradation

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[61] Bad River Band of Lake Superior Tribe of Chippewa Indians Water Quality Standards adopted by Resolution No. 7-6-11-441 (hereafter, Tribe's WQS).

[62] 36 C.F.R. § 800.16(l)(2).

[63] Tribe's WQS: See provisions E.3.ii. and E.4.iv.

[64] Tribe's WQS: See provision E.2.iii.

[65] See definition of cationic treatment chemicals in Appendix A of the CGP.

[66] Tribe's WQS: See provisions E.6.ii.a. and E.6.ii.c.

[67] See footnote 61.

[68] Tribe's WQS: See provision E.2.ii.

demonstration materials described in provision E.4.iii. must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

f. An operator proposing to discharge to an Exceptional Resource Water (or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Exceptional Resource Waters, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal Resource Water (Tier 3 water).[69] The antidegradation demonstration materials described in provision E.4.ii. must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

g. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.[70]

h. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.

i. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities.[71, 72] The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

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[69] Tribe's WQS: See provision E.2.i.

[70] Tribe's WQS: See provision E.7.iii.

[71] See footnote 61.

[72] See footnote 62.

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39
Odanah, WI 54861

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA.

j. The THPO must be provided 30 days to comment on the project.[73]

k. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.[74]

l. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI: [75]

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

m. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion: [76]

Bad River Tribe's Natural Resources Department
P.O. Box 39
Odanah, WI 54861

n. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.[77]

9.3.2.2 Lac du Flambeau Band of Lake Superior Tribe of Chippewa Indians: The following conditions apply only to discharges on the Lac du Flambeau Band of the Lake Superior Tribe of Chippewa Indians Reservation:

a. A copy of the Stormwater Pollution Prevention Plan must be submitted to the following office, for the Traival environmental review process, at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Lac du Flambeau
Tribal Land Management

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[73] 36 C.F.R. § 800.3(c)(4).

[74] 36 C.F.R. § 800.3(b).

[75] See footnote 61.

[76] See footnote 61.

[77] See footnote 61.

P.O. Box 279
Lac du Flambeau, WI 54538

CGP applicants are encouraged to work with the LdF Water Resources Program in the identification of all proposed receiving waters.

b. Copies of the NOI and the Notice of Termination (NOT) must be sent to the LdF Water Resources Program at the same time they are submitted to EPA.

c. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Lac du Flambeau Reservation. This includes, but is not limited to, the prevention of any discharge that cause a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Lac du Flambeau Reservation for any of the uses designated in the Water Quality Standards of the Lac du Flambeau Reservation.

d. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Lac du Flambeau Reservation. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the Lac du Flambeau reservation, including groundwater.

e. This certification does not authorize impacts to cultural, historical, or archeological features or sties, or properties that may be eligible for such listing.

f. Due to the significant ecological and cultural importance of the Lac du Flambeau Reservation, any operator requesting a permit for a point source discharge of pollutants (i.e., discharge) associated with the Stormwater Discharge will need a stormwater pollution prevention plan in place that does not violate Lac du Flambeau Water Quality Standards to protect Reservation Waters.

9.4 EPA REGION 6

9.4.1 NMR100000 State of New Mexico, except Indian country

a. If construction dewatering activities are anticipated at a site, permittees must complete the following steps:

   i. Investigative information must be documented in the facility SWPPP.

   ii. Refer to the GWQB Mapper at https://gis.web.env.nm.gov/GWQB/ AND the PSTB Mapper (Go Mapper) at https://gis.web.env.nm.gov/GoNM/ and check if the following sources are located within the noted distance from your anticipated construct site groundwater dewatering activity:

Project Location Relative to a Source of Potential Groundwater Contamination	***Constituents likely to be required for testing***
Within 0.5 mile of an open Leaking Underground Storage Tank (LUST) site	*BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) plus additional parameters depending on site conditions.**

Project Location Relative to a Source of Potential Groundwater Contamination	***Constituents likely to be required for testing***
Within 0.5 mile of an open Voluntary Remediation site	*All parameters listed in Appendix A (or an alternate list approved by the NMED SWQB)***
Within 0.5 mile of an open RCRA Corrective Action Site	
Within 0.5 mile of an open Abatement Site	
Within 0.5 mile of an open Brownfield Site	
Within 1.0 mile or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination.	

**For further assistance determining whether dewatering may encounter impacted groundwater, the permittee may contact the NMED Ground Water Quality Bureau at: 505-827-2965.*

***EPA approved-sufficiently sensitive methods must be used - approved methods are listed in 40 CFR Part 136.3.*

iii. If dewatering activities are anticipated, information on flow and potential to encounter impacted groundwater must be provided directly to NMED at the following address:

Program Manager, Point Source Regulation Section
NMED Surface Water Quality Bureau
PO Box 5469, Santa Fe, NM 87502

Information may also be emailed - the contact information for the program manager is located on the website at: www.env.nm.gov/swqb/PSR.

iv. Permittee must test the quality of the water being considered for discharge. Permittees must contact the Point Source Regulation Section Program Manager for information on constituents that must be monitored.

v. Permittee must send test result data to EPA Region 6 and the NMED Surface Water Quality Bureau. If the test data exceed standards, it cannot be discharged from the construction site into surface waters under this permit. Discharge to surface waters must be conducted under a separate NPDES individual permit to ensure proper treatment and disposal.

vi. If disposal will be to the ground surface or in an unlined pond, the permittee must submit an NOI/ to the NMED Ground Water Quality Bureau.

b. Operators are not eligible to obtain authorization under this permit for all new and existing storm water discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3" waters.)

i. Although state WQS provide for temporary and short-term degradation of water quality in an ONRW under very limited circumstances if approved by the Water Quality Control Commission as specified at 20.6.4.8.A NMAC, the approval process required for these activities does not lend itself for use for projects covered under this general permit. This condition is necessary to ensure that no degradation is allowed in ONRWs by requiring proposed storm water discharges to be reviewed under the individual permit process. Tier 3 waters are defined in Appendix F of the proposed permit.

c. Operators who intend to obtain authorization under this permit for new and existing storm water discharges from construction sites must satisfy the following condition: The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure that applicable standards in 20.6.4.NMAC, including the antidegradation policy, or TMDL waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs. For sites greater than 5 acres in size, BMP selection must be made based on the use of appropriate soil loss prediction models (i.e. SEDCAD, RUSLE, SEDIMOT, MULTISED, etc.) OR equivalent generally accepted (by professional erosion control specialists) soil loss prediction tools.

   i. For all sites, the operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will assure that the applicable standards or TMDL WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from preconstruction, pre-development conditions.

   ii. All SWPPPs must be prepared in accordance with good engineering practices by qualified (e.g. CPESC certified, engineers with appropriate training) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

d. State regulations at 20.6.2.1203 NMAC state: *With respect to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, the following notifications and corrective actions are required*:

   i. As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, any person in charge of the facility shall orally notify the Chief of the Ground Water Quality Bureau of the department, or his counterpart in any constituent agency delegated responsibility for enforcement of these rules as ta any facility subject to such delegation.

   Permittees can call 505-827-9329 for emergencies at any time and 505-476-6000 for non-emergencies during business hours from 5am-5pm, Monday through Friday.

e. NMED does not allow permittees to use the Equivalent Analysis Waiver.

9.4.2 NMR10I000 Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.

9.4.2.1 Pueblo of Isleta. The following conditions apply only to discharges on the Pueblo of Isleta Reservation:

a. CGP at 1.3 Prohibited discharges: Stormwater discharges associated with construction activity that EPA or the Pueblo of Isleta, prior to authorization under this perm it, determines will cause, have the reasonable potential to cause, or may reasonably be expected to contribute to a violation or excursion of any applicable water quality standard, including the antidegradation policy, or the impairment of a designated use of receiving waters are not authorized by this permit.

b. CGP at 1.4.1 How to Submit Your NOI: The operator shall provide a copy of the Notice of Intent ("NOI") to the Pueblo of Isleta at the same time it is submitted to the U.S. Environmental Protection Agency, for projects occurring within the exterior boundaries of the Pueblo of Isleta. The operator shall also notify the Pueblo of Isleta when it has submitted the Notice of Termination ("NOT"). The NOI and NOT shall be sent to the Pueblo of Isleta at the following address:

Water Quality Control Officer
Pueblo of Isleta
Environment Division
PO Box 1270
Isleta, NM 87022
(505) 869-7565
E-mail: POI36871@isletapueblo.com

<u>Overnight/Express Mail Delivery</u>
Pueblo of Isleta
Environment Division
6 Sagebrush St.
Albuquerque, NM 87105

c. CGP at 1.5 Requirement to post a notice of your permit coverage: Amend to read: "You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so that it is visible from the public road <u>or tribal road</u> that is nearest to the active part of the construction site…"

d. CGP at 7.2.6 Description of stormwater controls: The SWPPP will be considered to be incomplete if the operator has not coordinated requirements under this Part with the Pueblo of Isleta Public Services Department.

e. CGP I.12.6.1 at pg.I-6 of 8. The Pueblo of Isleta requests notification within 10 hours (rather than 24 hrs.) if health or the environment become endangered.

f. CGP at I.12.2 Anticipated noncompliance: Amend to read: "You must give advance notice to EPA and the Pueblo of Isleta at the address indicated in 1.4.1(a) of any planned changes in the permitted facility or activity which may results in noncompliance with permit requirements."

g. CGP at I.12.6.1: Any noncompliance for projects within the exterior boundaries of the Pueblo of Isleta which may endanger health or the environment shall be reported directly to the EPA Regional Office [(see contacts at https://www.epa.gov/npdes/contact-us-stormwater#regional) I and to the Pueblo of Isleta Water Quality Control Officer. Any information must be provided orally with n 12 hours of the time you become aware of the circumstances. Other requirements of this Part for a written submission apply. Electronic communication (E-mail) shall be provided as soon as practical. Verbal notice shall be provided to:

Water Quality Control Officer
Pueblo of Isleta
E-mail: POI36871@isletapueblo.com
(505) 869-7565
(505) 263-5425 cellular
(505) 869-3030 Police Dispatch

h. CGP at 2.2 Erosion and sediment control requirements: Erosion and sediment controls shall be designed to retain sediment on-site.

i. CGP at 2.2 Under Sediment control requirements, Standard Permit Condition Duty to Mitigate Volumes of sediment at or over (five) 5 cubic yards must be removed and placed for disposal within a tribally approved sediment Disposal Site, located on Pueblo of Isleta lands. CGP 2.2 at pg. 8.

j. Under Minimize erosion, a permittee must secure permission from the Pueblo or affected Pueblo of Isleta land assignment owner if a dissipation device needs to be placed up- or down- elevation of a given construction site. CGP 2.2.11 at pg. 11.

k. CGP at 2.3.6 Emergency spill notification requirements: You must notify the Pueblo of Isleta Water Quality Control Officer and National Response Center (NRC) [at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302] as soon as you have knowledge of the release. Verbal and electronic notice shall be provided as specified in I.12.6.1

l. CGP at C.3 Equivalent analysis waiver: Parties wishing to apply for an Equivalent Analysis Waiver (see Appendix D, Section C) must provide a copy of the waiver analysis to the Pueblo of Isleta Water Quality Control Officer at the address indicated in 1.4.1 (a).

9.4.2.2 Pueblo of Sandia. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

a. Only those activities specifically authorized by the CGP are authorized by the Pueblo of Sandia's Water Quality certification. The Pueblo of Sandia's Water Quality Certification does not authorize impact to cultural properties, historical sites or properties that may be eligible as such.

b. Copies of all Notices of Intent (NOI) submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address. Discharges are not authorized by this permit unless an accurate and complete NOI has been submitted to the Pueblo of Sandia, either by mail or electronically.

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Scott Bulgrin, Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

Electronically:
sbulgrin@sandiapueblo.nsn.us

c. Any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident written reports should likewise be routed to the Pueblo of Sandia at the above address.

d. The Stormwater Pollution Prevention Plan (SWPPP) must be available to the Pueblo of Sandia Environment Department either electronically or hard copy upon request for review. The SWPPP must be made available at least fourteen (14) days before construction begins. The fourteen (14) day period will give Pueblo staff time to become familiar with the project site, prepare for construction site inspections, and determine compliance with the Pueblo of Sandia Water Quality Standards. Failure to provide a SWPPP to the Pueblo of Sandia may result in the delay or denial of the construction project.

e. If requested by the Pueblo of Sandia Environment Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Pueblo of Sandia Water Quality Standards and/or applicable Federal Standards not authorized by this certification.

f. An "Authorization to Proceed Letter" with site specific mitigation requirements may be sent out to the permittee when a review of the NOI and SWPPP, on a case- by-case basis is completed by the Pueblo of Sandia Environment Department. This approval will allow the application to proceed if all mitigation requirements are met.

g. The Pueblo of Sandia will not allow Small construction Waivers (Appendix C) or the Rainfall Erosivity Waiver (Appendix C.1) to be granted for any small construction activities.

h. Before submitting a Notice of Termination (NOT) to the EPA, permittees must clearly demonstrate to the Pueblo of Sandia Environment Department through a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating the NOT is acceptable and all requirements have been met will be sent to the permittee to add to the permittee's NOT submission to EPA.

i. Copies of all NOT submitted to the EPA must also be sent concurrently to the Pueblo of Sandia through the mail or electronically.

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Scott Bulgrin, Water Quality Manager 481 Sandia Loop
Bernalillo, New Mexico 87004

Electronically:
sbulgrin@sandiapueblo.nsn.us

j. The Pueblo of Sandia may require the permittee to perform water quality monitoring for pH, turbidity, and total suspended solids (TSS) during the permit term if the discharge is to a surface water leading to the Rio Grande for the protection of public health and the environment.

9.4.2.3 **Pueblo of Santa Ana.** The following conditions apply only to discharges on the Pueblo of Santa Ana Reservation:

a. The operator shall provide a copy of the Notice of Intent (NOI) to the Pueblo of Santa Ana (the Pueblo), at the same time it is submitted to the U.S. Environmental Protection Agency (EPA), for projects with discharges onto the lands of the Pueblo as defined in the Pueblo of Santa Ana Water Quality Standards.

b. The operator shall provide a copy of the Stormwater Pollution Prevention Plan (SWPPP), at the same time that an NOI is submitted to the EPA, to the Pueblo for projects with discharges onto the lands of the Pueblo as defined in the Pueblo of Santa Ana Water Quality Standards.

c. The operator shall provide a copy of the SWPPP, copies of inspections reports, and copies of corrective action reports to the Pueblo at the address below for review, upon request.

d. The NOI, SWPPP and Notice of Termination (NOT) shall be sent to the Pueblo at the following address:

Pueblo of Santa Ana Department of Natural Resources,
Attention: Water Quality Program Specialist
2 Dove Road
Santa Ana Pueblo, NM, 87004

e. Discharges are not authorized by this permit unless an accurate and complete NOI and SWPPP have been submitted to the Pueblo. Failure to provide an accurate and complete NOI and SWPPP may result in a denial of the discharge permit or groundbreaking or construction delay.

f. The operator will not proceed with site work until authorized by the Pueblo. The Pueblo requires review of the complete and final SWPPP by the Pueblo before authorization to proceed. The Pueblo will provide an "authorization to proceed" notice after review and approval of the SWPPP.

g. Before submitting a NOT, permittees must certify to the Pueblo's Department of Natural Resources in writing that requirements for site stabilization have been met, and any temporary erosion control structures have been removed. Documentation of the Pueblo's review that such requirements have been reviewed and met will be provided for the permittee to add to the permittee's NOT submission to EPA. Copies of all NOT submitted to the EPA must also be sent to the Pueblo at the address provided above.

9.4.2.4 Pueblo of Santa Clara. The following conditions apply only to discharges on the Pueblo of Santa Clara Reservation:

a. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Santa Clara Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency.

b. A copy of the Storm water Pollution Prevention Plan shall be made available to the Pueblo of Santa Clara staff upon request.

9.4.2.5 Pueblo of Tesuque. The following conditions apply only to discharges on the Pueblo of Tesuque Reservation:

a. The operator shall provide a copy of the Notice of Intent (NOI) to the Pueblo of Tesuque Governor’s Office and Environment Department at same time it is submitted to the Environmental Protection Agency, for projects occurring within the exterior boundaries of our tribal lands. The operator shall also notify the Pueblo of Tesuque Governor's Office and Environment Department when it submitted the Notice of Termination. The NOI and NOT shall be sent to the Pueblo of Tesuque Governor's Office and Environment Department at the following address:

Pueblo of Tesuque
Office of the Governor
Route 42 Box 360-T
Santa Fe, NM 87506 or
email: governor@pueblooftesuque.org

b. The operator shall also provide a copy of the Stormwater Pollution Prevention Plan, copies of inspections reports, and copies of corrective action reports to staff in the Pueblo of Tesuque Environment Department.

9.4.2.6 Taos Pueblo. The following conditions apply only to discharges on the Taos Pueblo Reservation:

a. The operator shall provide a copy of the Notice of Intent (NOI) to the Taos Pueblo Governor's Office, War Chief's Office and Environmental Office, at the same time it is submitted to the U.S. Environmental Protection Agency, for projects occurring within the exterior boundaries of Taos Pueblo. The operator shall also notify Taos Pueblo when it has submitted the Notice of Termination (NOT). The NOI and NOT shall be sent to the Taos Pueblo at the following addresses:

i. Taos Pueblo Governor's Office
P.O. Box 1846
Taos NM 87571

ii. Taos Pueblo War Chief's Office
P.O. Box 2596
Taos NM 87571

iii. Environmental Office
Attn: Program Manger
P.O. Box 1846
Taos NM 87571

b. Taos Pueblo requests that in the event Indian artifacts or human remains are inadvertently discovered on projects occurring near or on Taos Pueblo lands that consultation with the tribal Governor's Office occur at the earliest possible time.

c. The operator shall provide a copy of the Stormwater Pollution Prevention Plan, copies of inspections reports, and copies of corrective action reports to staff in the Taos Pueblo Environmental Office for review and copy, upon request.

9.4.2.7 Ohkay Owingeh. The following conditions apply only to discharges on the Ohkay Owingeh Reservation:

a. Prior to commencement of any construction activity on Ohkay Owingeh Lands requiring permit coverage under EPA's Construction General Permit, the operator(s) shall submit to Ohkay Owingeh Office of Environmental Affairs, a copy of the electronic "Notice of Intent," submitted to the Environmental Protection Agency, immediately following EPA's electronic notification that the NOI has been received. A copy of the Stormwater Pollution Prevention Plan(s) must be made available to the Ohkay Owingeh Office of Environmental Affairs upon the tribe's request either electronically or hard copy. Operator(s) shall also submit to Ohkay Owingeh Office of Environmental Affairs a copy of the electronic Notice of Termination (NOT) submitted to the Environmental Protection Agency. Documents shall be submitted to Ohkay Owingeh at the following address:

Ohkay Owingeh Office of Environment Affairs
Attention: Environmental Programs Manager
P.O. Box 717
Ohkay Owingeh, New Mexico 87566
Office # 505.852.4212
Fax # 505.852.1432
Electronic mail: naomi.archuleta@ohkay.org

b. Ohkay Owingeh will not allow the Rainfall Erosivity Waivers (see Appendix C) to be granted for any small construction activities.

c. All vegetation used to prevent soil loss, seeding or planting of the disturbed area(s) to meet the vegetative stabilization requirements must utilize native seeds/vegetation commonly known to the area. All temporary erosion control structures, such as silt fences must be removed as soon as stabilization requirements are met.

9.4.3 OKR10I000 Indian country within the State of Oklahoma

9.4.3.1 Pawnee Nation. The following conditions apply only to discharges within Pawnee Indian country:

a. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time it is submitted to the Environmental Protection Agency to the following address:

Pawnee Nation Department of Environmental Conservation and Safety
P.O. Box 470
Pawnee, OK 74058
Or email to mmatlock@pawneenation.org

b. The Storm Water Pollution Prevention Plan must be available to Departmental inspectors upon request.

c. The Department must be notified at 918.762.3655 immediately upon discovery of any noncompliance with any provision of the permit conditions.

9.4.4 OKR10F000 Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

a. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any other mineral mining.

b. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

c. In order to company with Oklahoma's Water Quality Standards, these conditions and restrictions also apply to any construction projects located wholly or partially on Indian Country lands within the State of Oklahoma.

9.5 EPA REGION 8

9.5.1 MTR10I000 Indian country within the State of Montana

9.5.1.1 The Confederated Salish and Kootenai Tribes of the Flathead Nation. The following conditions apply only to discharges on the Confederated Salish and Kootenai Tribes of the Flathead Nation Reservation:

a. Permittees must submit the Stormwater Pollution Prevention Plan (SWPPP) to the Confederated Salish and Kootenai Tribes at least 30 days before construction starts.

b. Before submitting the Notice of Termination (NOT), permittees must clearly demonstrate to an appointed Tribal staff person during an onsite inspection that requirements for site stabilization have been met.

c. The permittee must send a copy of the Notice of Intent (NOI) and the NOT to CSKT.

d. Permittees may submit their SWPPPs, NOIs and NOTs electronically to: clintf@cskt.org.

e. Written SWPPPs, NOIs and NOTs may be mailed to:

Clint Folden, Water Quality Regulatory Specialist
Confederated Salish and Kootenai Tribes
Natural Resources Department
P.O. Box 278
Pablo, MT 59855

9.6 EPA REGION 9

9.6.1 CAR10I000 Indian country within the State of California

9.6.1.1 Twenty-Nine Palms Band of Mission Indians. The following conditions apply only to discharges on the Twenty-Nine Palms Band of Mission Indians Reservation:

a. At the time the applicant submits its Notice of Intent (NOI) to the EPA, the applicant must concurrently submit written notification of the NOI and a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Twenty-Nine Palms Band of Mission Indians at the address below:

Tribal Environmental Coordinator
Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236

b. The applicant must also concurrently submit to the Tribal Environmental Coordinator written notification of any other forms or information submitted to the EPA, including waivers, reporting, and Notice of Termination (NOT).

c. Permitted entities under the CGP must keep the Tribal EPA informed of authorized discharges under the CGP by submitting written information about the type, quantity, frequency and location, intended purpose, and potential human health and/or environmental effects of their activities. These requirements are pursuant to Section 4 of the Twenty-Nine Palms Band of Mission Indians Water Pollution Control Ordinance (022405A). This information may be submitted to Tribal EPA in the form of Stormwater Pollution Prevention Plans (SWPPPs), monitoring reports, or other reports as required under the CGP. Spills, leaks, or unpermitted discharges must be reported in writing to Tribal EPA within 24 hours of the incident.

9.6.2 GUR100000 Island of Guam. The following conditions apply only to discharges on the Island of Guam:

a. Any earth-moving operations which require a permit must be obtained from the Department of Public Works (DPW) with clearance approval from various Government of Guam Agencies including Guam EPA prior to the start of any earth-moving activity.

b. In the event that the construction sites are within the Guam Sole Source Aquifer, the construction site owner and operator must consider opportunities to facilitate groundwater recharge for construction and post-construction implementing infiltration Best Management Practices. Stormwater disposal systems shall be designed and operated within the boundaries of the project. Stormwater systems shall not be permitted within any Wellhead Protection Zone unless the discharge meets the Guam Water Quality Standards within the zone. Waters discharged within the identified category G-2 recharge zone shall receive treatment to the degree required to protect the drinking water quality prior to it entering the category G-1 resource zone.

c. All conditions and requirements set forth in the 22 Guam Administrative Rules and Regulations (GARR), Division II, Water Control, Chapter 10, Guam Soil Erosion and Sediment Control Regulations (GSESCR) that are more protective than the CGP regarding construction activities must be complied with.

d. All standards and requirements set forth in the 22 GARR, Division II, Water Control, Chapter 5, *Guam Water Quality Standards (GWQS) 2001 Revisions*, must be complied with to include reporting GWQS exceedance to Guam EPA.

e. All operators/owners of any property development or earth moving activities shall comply with the erosion control pre-construction and post-construction BMP design performance standards and criteria set forth in the 2006 CNMI and Guam Stormwater Management Manual.

f. All conditions and requirements regarding dewatering activities set forth in 22 Guam Administrative Rules and Regulations Chapter 7, Water Resources Development and Operating Regulations must be complied with to include securing permits with Guam EPA prior to the start of any dewatering activities.

g. If a project to be developed is covered under the Federal Stormwater Regulations (40 CFR Parts 122 & 123), a Notice of Intent (NOI) to discharge stormwater to the surface and marine waters of Guam must be submitted to the U.S. EPA and a copy furnished to Guam EPA, pursuant to Section 10, 104(B)(5)(d) 22GAR, Division II, Chapter 10.

h. Guam EPA shall apply the Buffer Requirements listed in Appendix G of the CGP NPDES Permit for construction activities as it pertains to Waters of the U.S. in Guam. Guam EPA shall also apply the same buffer requirements for sinkholes in Guam.

i. When Guam EPA, through its permit review process, identifies that the proposed construction activity is close proximity to marine waters, contractors and owners will be informed that any activity that may impair water quality are required to stop during peak coral spawning periods as per the Guam Coral Spawning Construction Moratoriums.

j. The Proposed Construction General Permit must set appropriate measures and conditions to protect Guam's Threatened and Endangered Species and Outstanding Resource Waters of exceptional recreational or ecological significance as determined by the Guam EPA Administrator as per *Guam Water Quality Standards 2001 Revisions,* §5102, Categories of Waters, D. Outstanding Resource Waters.

k. When Guam EPA through its permit review process identifies that proposed construction activity is in close proximity to any Section 303d impaired waters, which includes marine waters and surface waters, shall ensure that construction activity does not increase the impaired water's ambient parameters.

l. When Rainfall Erosivity and TMDL Waivers reflected in the CGP, Appendix C, are submitted to the U.S. EPA, Guam EPA will review waivers on a project by project basis.

m. Prior to submission of the Notice of Termination (NOT) to the U.S. EPA, permittees must clearly demonstration to Guam EPA that the project site has met all soil stabilization requirements and removal of any temporary erosion control as outlined in the GSESCR.

9.7 EPA REGION 10

9.7.1 IDR100000 State of Idaho, except Indian country

a. *Idaho's Antidegradation Policy*. The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

1. Tier I Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.05).
2. Tier II Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
3. Tier III Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

b. *Pollutants of Concern.* The primary pollutants of concern associated with stormwater discharges from construction activities are sediment, typically measured as total suspended solids and turbidity. Other potential pollutants include the following:

phosphorus, nitrogen, pesticides, organics, metals, PCBs, petroleum products, construction chemicals, and solid wastes.

c. *Receiving Water Body Level of Protection.* The CGP provides coverage to construction activities throughout the entire State of Idaho. Because of the statewide applicability, all of the jurisdictional waters within Idaho could potentially receive discharges either directly or indirectly from activities covered under the CGP. DEQ applies a water body by water body approach to determine the level of antidegradation a water body will receive.

All waters in Idaho that receive discharges from activities authorized under the CGP will receive, at minimum Tier I antidegradation protection because Idaho's antidegradation policy applies to all waters of the state. Water bodies that fully support their aquatic life or recreational uses are considered to be *high quality waters* and will receive Tier II antidegradation protection.

Although Idaho does not currently have any Tier III designated outstanding resource waters (ORWs) designated, it is possible for a water body to be designated as an ORW during the life of the CGP. Because of this potential, the antidegradation review also assesses whether the permit complies with the outstanding resource water requirements of Idaho's antidegradation policy.

To determine the support status of the receiving water body, persons filing a Notice of Intent (NOI) for coverage under this general permit must use the most recent EPA-approved Integrated Report, available on Idaho DEQ's website: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report/.

High quality waters are identified in Categories 1 and 2 of the Integrated Report. If a water body is in either Category 1 or 2, it is a Tier II water body.

Unassessed waters are identified as Category 3 of DEQ's Integrated Report. These waters require a case-by-case determination to be made by DEQ based on available information at the time of the application for permit coverage. If a water body is unassessed, the applicant is directed to contact DEQ for assistance in filing the NOI.

Impaired waters are identified in Categories 4 and 5 of the Integrated Report. Category 4(a) contains impaired waters for which a TMDL has been approved by EPA. Category 4(b) contains impaired waters for which controls other than a TMDL have been approved by EPA. Category 5 contains waters which have been identified as "impaired," for which a TMDL is needed. These waters are Tier I waters, for the use which is impaired. With the exception, if the aquatic life uses are impaired for any of these three pollutants—dissolved oxygen, pH, or temperature—and the biological or aquatic habitat parameters show a health, balanced biological community, then the water body shall receive Tier II protection, in addition to Tier I protection, for aquatic life uses (IDAPA 58.01.02.052.05.c.i.).

DEQ's webpage also has a link to the state's map-based Integrated Report which presents information from the Integrated Report in a searchable, map-based format: http://www.deq.idaho.gov/assistance-resources/maps-data/.

Water bodies can be in multiple categories for different causes. If assistance is needed in using these tools, or if additional information/clarification regarding the support status of the receiving water body is desired, the operator is directed to make contact with the appropriate DEQ regional office of the State office in the table below:

Regional and State Office	Address	Phone Number	Email
Boise	1445 N. Orchard Rd., Boise 83706	208-373-0550	Kati.carberry@deq.idaho.gov
Coeur d'Alene	2110 Ironwood Parkway, Coeur D'Alene 83814	208-769-1422	June.bergquist@deq.idaho.gov
Idaho Falls	900 N. Skyline, Suite B., Idaho Falls 83402	208-528-2650	Troy.saffle@deq.idaho.gov
Lewiston	1118 "F" St., Lewiston 83501	208-799-4370	Mark.sellet@deq.idaho.gov
Pocatello	444 Hospital way, #300 Pocatello 83201	208-236-6160	Lynn.vanevery@deq.idaho.gov
Twin Falls	650 Addison Ave., W., Suite 110, Twin Falls 83301	208-736-2190	Balthasar.buhidar@deq.idaho.gov
State Office	1410 N. Hilton Rd., Boise 83706	208-373-0502	Nicole.deinarowicz@deq.idaho.gov

d. *Turbidity Monitoring.* The permittee must conduct turbidity monitoring during construction activities and thereafter on days where there is a direct discharge of pollutants from an unstabilized portion of the site which is causing a visible plume to a water of the U.S.

A properly and regularly calibrated turbidimeter is required for measurements analyzed in the field (preferred method), but grab samples may be collected and taken to a laboratory for analysis. If the permittee can demonstrate that there will be no direct discharge from the construction site, then turbidity monitoring is not required. When monitoring is required, a sample must be taken at an undisturbed area immediately upstream of the project area to establish background turbidity levels for the monitoring event. Background turbidity, location, date and time must be recorded prior to monitoring downstream of the project area. A sample must also be taken immediately downstream from any point of discharge and *within* any visible plume. The turbidity, location, date and time must be recorded. The downstream sample must be taken immediately following the upstream sample in order to obtain meaningful and representative results.

Results from the compliance point sampling or observation[78] must be compared to the background levels to determine whether project activities are causing an exceedance of state WQS. If the downstream turbidity is 50 NTUs or more than the upstream turbidity, then the project is causing an exceedance of WQS. *Any exceedance of the turbidity standard must be reporting to the appropriate DEQ regional office within 24 hours. The following six (6) steps should be followed to ensure compliance with the turbidity standard:*

1. If a visible plume is observed, quantify the plume by collecting turbidity measurements from within the plume and compare the results to Idaho's instantaneous numeric turbidity criterion (50 NTU over the background).
2. If turbidity is less than 50 NTU instantaneously over the background turbidity; continue monitoring as long as the plume is visible. If turbidity exceeds background turbidity by more than 50 NTU instantaneously then stop all earth disturbing construction activities and proceed to step 3.
3. Take immediate action to address the cause of the exceedance. That may include inspection the condition of project BMPs. If the BMPs are functioning to their fullest capability, then the permittee must modify project activities and/or BMPs to correct the exceedance.
4. Notify the appropriate DEQ regional office within 24 hours.
5. Possibly increase monitoring frequency until state water quality standards are met.
6. Continue earth disturbing construction activities once turbidity readings return to within 50 NTU instantaneously and 25 NTU for more than ten consecutive days over the background turbidity.

Copies of daily logs for turbidity monitoring must be available to DEQ upon request. The report must describe all exceedances and subsequent actions taken, including the effectiveness of the action.

e. *Reporting of Discharges Containing Hazardous Materials or Petroleum Products.* All spills of hazardous material, deleterious material or petroleum products which may impact waters (ground and surface) of the state shall be immediately reported. Call 911 if immediate assistance is required to control, contain or clean up the spill. If no assistance is needed in cleaning up the spill, contact the appropriate DEQ regional office in the table below during normal working hours or Idaho State Communications Center after normal working hours. If the spilled volume is above federal reportable quantities, contact the National Repose Center.

For immediate assistance: Call 911

National Response Center: (800) 424-8802

Idaho State Communications Center: (800) 632-8000

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[78] A visual observation is only acceptable to determine whether BMPs are functioning properly. If a plume is observed, the project may be causing an exceedance of WQS and the permittee must collect turbidity data and inspect the condition of the projects BMPs. If the BMPs appear to be functioning to their fullest capability and the turbidity is 50 NTUs or more than the upstream turbidity, then the permittee must modify the activity or implement additional BMPs (this may also include modifying existing BMPs).

Regional office	Toll Free Phone Number	Phone Number
Boise	888-800-3480	208-373-0550
Coeur d'Alene	877-370-0017	208-769-1422
Idaho Falls	800-232-4635	208-528-2650
Lewiston	977-547-3304	208-799-4370
Pocatello	888-655-6160	208-236-6160
Twin Falls	800-270-1663	208-736-2190

9.7.2 IDR10I000 Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)

9.7.2.1 Shoshone-Bannock Tribes. The following conditions apply only to discharges on the Shoshone-Bannock Reservation:

f. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Shoshone-Bannock Tribes Water Resources Department at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Shoshone-Bannock Tribes Water Resources Department the acknowledgement of receipt of the NOI from the EPA within 7 calendar days of receipt from the EPA.

9.7.3 WAR10F000 Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator. The following conditions apply only to discharges on federal facilities in the State of Washington:

a. Discharges shall not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges that are not in compliance with these standards are not authorized.

b. Prior to the discharge of stormwater and non-storm water to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate SWPPP, with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

c. Permittees who discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, phosphorus, or pH must comply with the following numeric effluent limits:

Parameter Identified in 303{d) Listing	Parameter Sampled	Unit	Analytical Method	Numeric Effluent Limit
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130 or EPA 180.1	25 NTUs at the point where the stormwater is discharged from the site.
High pH	pH	Su	pH meter	In the range of 6.5 – 8.5

d. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA approved listing of impaired waters that exists on February 16, 2017, or the date when the operator's complete permit application is received by EPA, whichever is later.

e. Discharges to waterbodies subject to an applicable Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus, shall be consistent with the assumptions and requirements of the TMDL.

   i. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements establish by the applicable TMDL.

   ii. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.

   iii. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.

   iv. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

   v. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to February 16, 2017, or prior to the date the operator's complete NOI is received by EPA, whichever is later.

9.7.4 WAR10I000 Indian country within the State of Washington

9.7.4.1 Confederated Tribes of the Colville Reservation. The following conditions apply only to discharges on the Colville Indian Reservation (CIR) and on other Tribal trust lands or allotments of the Confederated Tribes of the Colville Reservation:

a. A copy of the Stormwater Pollution Prevention Plan must be submitted to the following office at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Environmental Trust Department
Confederated Tribes of the Colville Reservation
PO Box 150
Nesepelem, WA 99155

b. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be sent to the ETD at the same time they are submitted to EPA.

c. Discharges to Omak Creek, the Okanogan River, and Columbia River downstream of Chief Joseph Dam may affect threatened or endangered species, and shall only be permitted in adherence with Appendix D of the CGP.

d. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Chapter 4-8 Water Quality Standards of the Colville Law and Order Code, as amended.

e. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the CIR. All spills must be reported to the appropriate emergency management agency and the ETD, and measures shall be taken immediately to prevent the pollution of waters of the CIR, including groundwater.

f. Stormwater site inspections shall be conducted at least once every 7 calendar days, within 24-hours of the occurrence of a rain event of 0.25 inches or greater in a 24-hour period, and daily during periods of saturated ground surface or snowmelt with accompanying surface runoff.

g. Results of discharge sampling must be reported to the ETD within 7 days of sample collection. All sample reporting must include the date and time, location, and individual performing the sampling.

h. Any corrective action reports that are required under the CGP must be submitted to the ETD at the above address within one (1) working day of the report completion.

i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or proprieties that may be eligible for such listing.

9.7.4.2 Lummi Nation. The following conditions apply only to discharges on the Lummi Reservation:

a. The Lummi Nation reserves the right to modify this 401 certification if the final version of the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (CGP) on tribal lands in the State of Washington (Permit No. WAR10I000) is substantively different than the draft version of the proposed permit that was made available for public comments during April 2016. The Lummi Nation will determine if the final version of the NPDES CGP is substantively different than the draft version following review of the final version once the EPA makes it available.

b. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Lummi tribal agencies. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtain a land use permit from the Lummi Planning Department as provided in Title 15 of the Lummi Code of Laws and regulations adopted thereunder.

c. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm Water Pollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

d. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210 together with supplements and amendments thereto).

e. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt from the EPA.

f. Each operator shall submit a signed hard copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

g. Storm Water Pollution Prevention Plans, Notice of Intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager
2665 Kwina Road
Bellingham, WA 98226-9298

9.7.4.3 Makah Tribe. The following conditions apply only to discharges on the Makah Reservation:

a. The operator shall be responsible for achieving compliance with the Makah Tribe's Water Quality Standards.

b. The operator shall submit a Storm Water Pollution Prevention Plan to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division for review and approval at least thirty (30) days prior to beginning any discharge activities.

c. The operator shall submit a copy of the Notice of Intent to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division at the same time it is submitted to EPA.

d. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Aaron Parker
Makah Fisheries Management Water Quality Specialist
(360) 645-3162
Cell 206-356-0319
Aaron.parker@makah.com
PO Box 115
Neah Bay WA 98357

9.7.4.4 Puyallup Tribe of Indians. The following conditions apply only to discharges on the Puyallup Tribe of Indians Reservation:

a. Each permittee shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards, including antidegradation provisions. The Puyallup Natural Resources Department will conduct an antidegradation review for permitted activities that have the potential to lower water quality. The antidegradation review will be consistent with the Tribe's Antidegradation Implementation Procedures. The Tribe may also impose additional controls on a site-specific basis, or request EPA to require the operator obtain coverage under an individual permit, if information in the NOI or from other sources indicates that the operator's discharges are not controlled as necessary to meet applicable water quality standards.

b. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation policies if the discharge point is located within 1 linear mile upstream of waters designated by the Tribe.

c. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Char Naylor (char.naylor@puyalluptribe.com) and Russ Ladley (russ.ladley@puyalluptribe.com) by email or at the address listed below at the same time it is submitted to EPA.

Puyallup Tribe of Indians
3009 E. Portland Avenue
Tacoma, WA 98404
ATTN: Russ Ladley and Char Naylor

d. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Tribe's Resource Protection Manager (russ.ladley@puyalluptribe.com) and Char Naylor (char.naylor@puyalluptribe.com) for review.

e. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Russ Ladley and Char Naylor at the address listed above.

f. The permittee shall submit all stormwater pollution prevention plans to Char Naylor for review and approval prior to beginning any activities resulting in a discharge to tribal waters.

g. The permittee shall conduct benchmark monitoring for turbidity (or transparency) and, in the event of significant concrete work or engineered soils, pH monitoring as well. Monitoring, benchmarks, and reporting requirements contained in Condition S.4. (pp.13-20) of the Washington State Construction Stormwater General Permit, effective January 1, 2016, shall apply, as applicable.

h. The permittee shall notify Char Naylor (253-680-5520) and Russ Ladley (253-680-5560) prior to conducting inspections at construction sites generating storm water discharged to tribal waters.

i. Treat dewatering discharges with controls necessary to minimize discharges of pollutants in order to minimize the discharge of pollutants to groundwater or surface waters from stormwater that is removed from excavations, trenches, foundations, vaults, or other storage areas. Examples of appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, and filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

   To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11 of EPA's 2016 General Construction Stormwater Permit. Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

j. The permittee shall provide and maintain natural buffers to the maximum extent possible (and/or equivalent erosion and sediment controls) when tribal waters are located within 100 feet of the site's earth disturbances. If infeasible to provide and maintain an undisturbed 100 foot natural buffer, erosion and sediment controls to achieve the sediment load reduction equivalent to a 100-foot undisturbed natural buffer shall be required.

9.7.4.5 Spokane Tribe of Indians. The following conditions apply only to discharges on the Spokane Tribe Reservation:

a. Pursuant to Tribal Law and Order Code (TLOC) Chapter 30 each operator shall be responsible for achieving compliance with the Surface Water Quality Standards of the Spokane Tribe. The operator shall notify the Spokane Tribe, Water Control Board (WCB) of any spills of hazardous material and;

b. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the WCB at the same time it is submitted to EPA.

c. The permittee shall allow the Tribal Water Control Board or its designee to inspect and sample at the construction site as needed.

d. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the WCB at the same time it is submitted to EPA.

The correspondence address for the Spokane Tribe Water Control Board is:

Water Control Board
c/o. Brian Crossley
P0 Box 480
Wellpinit WA 99040
(509)626-4409
crossley@spokanetribe.com

9.7.4.6 Swinomish Indian Tribal Community. The following conditions apply only to discharges on the Swinomish Reservation:

a. Owners and operators seeking coverage under this permit who intend to discharge to Regulated Surface Waters must submit a copy of the Notice of Intent (NOI) to the DEP at the same time the NOI is submitted to EPA.

b. Owners and operators seeking coverage under this permit must also submit a Stormwater Pollution Prevention Plan to the DEP for review and approval by DEP prior to beginning any discharge activities.

c. Owners and operators must also submit to the DEP Changes in NOI and/or Notices of Termination at the same time they are submitted to EPA.

9.7.4.7 Tulalip Tribes. The following conditions apply only to discharges on the Tulalip Reservation:

a. This certification does not exempt and is provisional upon compliance with other applicable statues and codes administered by federal and Tulalip tribal agencies. Pursuant to Tulalip Tribes code of law, the operator must also obtain a land use permit from the Tulalip Tribes Planning Department as provided in Title 7 of the Tulalip Tribal Code (http://www.codepublishing.com/WA/Tulalip/?Tulalip02/Tulalip0205.html).

b. Each CGP operator shall be responsible for achieving compliance with Tulalip Tribes Water Quality Standards.

c. Each CGP operator shall submit their Stormwater Pollution Prevention Plan (SWPPP) to the:

Tulalip Natural & Cultural Resources Department
Tulalip Tribes
6406 Marine Drive
Tulalip, WA 98271

Appendix A - Definitions and Acronyms

Definitions

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. See 50 CFR 402. For the purposes of this permit and for application of the threatened and endangered species protection eligibility requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as listed amphibians) are found in the ditch, swale, or gully.)
- The areas where stormwater from construction activities discharges into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls. (Example: Where a stormwater retention pond would be built.)
- The areas upstream and/or downstream from the stormwater discharge into a stream segment that may be affected by these discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

"Agricultural Land" - cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

"Antidegradation Policy" or "Antidegradation Requirements" - the water quality standards regulation that requires states and tribes to establish a three-tiered antidegradation program:

1. Tier 1 maintains and protects existing uses and water quality conditions necessary to support such uses. An existing use can be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur. Where an existing use is established, it must be protected even if it is not listed in the water quality standards as a designated use. Tier 1 requirements are applicable to all surface waters.
2. Tier 2 maintains and protects "high quality" waters -- waterbodies where existing conditions are better than necessary to support CWA § 101(a)(2) "fishable/swimmable" uses. Water quality can be lowered in such waters. However, state and tribal Tier 2 programs identify procedures that must be followed and questions that must be

answered before a reduction in water quality can be allowed. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

3. Tier 3 maintains and protects water quality in outstanding national resource waters (ONRWs). Except for certain temporary changes, water quality cannot be lowered in such waters. ONRWs generally include the highest quality waters of the United States. However, the ONRW classification also offers special protection for waters of exceptional ecological significance, i.e., those which are important, unique, or sensitive ecologically. Decisions regarding which water bodies qualify to be ONRWs are made by states and authorized Indian tribes.

"Arid Areas" – areas with an average annual rainfall of 0 to 10 inches.

"Bank" (e.g., stream bank or river bank) – the rising ground bordering the channel of a water of the U.S.

"Bluff" – a steep headland, promontory, riverbank, or cliff.

"Borrow Areas" – the areas where materials are dug for use as fill, either onsite or off-site.

"Business day" – for the purposes of this permit, a business day is a calendar day on which construction activities will take place.

"Bypass" – the intentional diversion of waste streams from any portion of a treatment facility. See 40 CFR 122.41(m)(1)(i).

"Cationic Treatment Chemical" – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

"Commencement of Construction Activities" – the initial disturbance of soils (or 'breaking ground') associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material; placement of raw materials at the site).

"Common Plan of Development or Sale" – A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one common plan. The "common plan" of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot.

"Construction Activities" – earth-disturbing activities, such as the clearing, grading, and excavation of land, and other construction-related activities (e.g., stockpiling of fill material; placement of raw materials at the site) that could lead to the generation of pollutants. Some of the types of pollutants that are typically found at construction sites are:

- sediment;
- nutrients;
- heavy metals;
- pesticides and herbicides;
- oil and grease;
- bacteria and viruses;
- trash, debris, and solids;

- treatment polymers; and
- any other toxic chemicals.

“Construction and Development Effluent Limitations and New Source Performance Standards” (C&D Rule) – as published in 40 CFR § 450, the regulation requiring effluent limitations guidelines (ELGs) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

“Construction Site” or “Site” – the land or water area where construction activities will occur and where stormwater controls will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether.

“Construction Support Activity” – a construction-related activity that specifically supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas.

“Construction Waste” – discarded material (such as packaging materials; scrap construction materials; masonry products; timber, steel, pipe, and electrical cuttings; plastics; and styrofoam).

“Conveyance Channel” – a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

“Critical Habitat” – as defined in the Endangered Species Act at 16 U.S.C. 1531 for a threatened or endangered species, (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

“CWA” – the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

“Dewatering” – the act of draining rainwater and/or ground water from building foundations, vaults, and trenches.

“Discharge” – when used without qualification, means the “discharge of a pollutant.”

“Discharge of a Pollutant” – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

“Discharge Point” – for the purposes of this permit, the location where collected and concentrated stormwater flows are discharged from the construction site.

“Discharge-Related Activity” – activities that cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction, and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged.

"Discharge to an Impaired Water" – for the purposes of this permit, a discharge to an impaired water occurs if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting an applicable water quality standard and (1) requires development of a total maximum daily load (TMDL) (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1). For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system.

"Domestic Waste" – for the purposes of this permit, typical household trash, garbage or rubbish items generated by construction activities.

"Drainageway" – an open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water.

"Drought-Stricken Area" – for the purposes of this permit, an area in which the National Oceanic and Atomospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php.

"Earth-Disturbing Activity"– actions taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

"Earth-Disturbing Activities Conducted Prior to Active Mining Activities" – Consists of two classes of earth-disturbing (i.e., clearing, grading and excavation) activities:

> a. activities performed for purposes of mine site preparation, including: cutting new rights of way (except when related to access road construction); providing access to a mine site for vehicles and equipment (except when related to access road construction); other earth disturbances associated with site preparation activities on any areas where active mining activities have not yet commenced (e.g., for heap leach pads, waste rock facilities, tailings impoundments, wastewater treatment plants); and
>
> b. construction of staging areas to prepare for erecting structures such as to house project personnel and equipment, mill buildings, etc., and construction of access roads.
>
> Note: only earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining (see (b) above) are considered to be "construction" and therefore stormwater discharges from these activities are eligible for coverage under this permit. See Part 1.2.1.b. The activities described in (a) above are not considered to be "construction" and therefore stormwater discharges associated with this activity are not eligible for coverage under this permit.

"Effective Operating Condition" – for the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

"Effluent Limitations" – for the purposes of this permit, any of the Part 2 or Part 3 requirements.

"Effluent Limitations Guideline" (ELG) – defined in 40 CFR § 122.2 as a regulation published by the Administrator under section 304(b) of the CWA to adopt or revise effluent limitations.

"Eligible" – for the purposes of this permit, refers to stormwater and allowable non-stormwater discharges that are authorized for coverage under this general permit.

"Emergency-Related Project" – a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

"Endangered Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

"Excursion" – a measured value that exceeds a specified limit.

"Existing Site" – a site where construction activities commenced prior to February 16, 2017.

"Exit Points" – any points of egress from the construction site to be used by vehicles and equipment during construction activities.

"Exposed Soils" – for the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

"Federal Operator" – an entity that meets the definition of "Operator" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

"Final Stabilization" – on areas not covered by permanent structures, either (1) uniform, perennial vegetation *(e.g., evenly distributed, without large bare areas)* has been established, or for arid or semi-arid areas, will be established that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas, and/or (2) permanent non-vegetative stabilization measures (e.g., riprap, gravel, gabions, and geotextiles) have been implemented to provide effective cover for exposed portions of the site

"General Contractor" – for the purposes of this permit, the primary individual or company solely accountable to perform a contract. The general contractor typically supervises activities, coordinates the use of subcontractors, and is authorized to direct workers at a site to carry out activities required by the permit.

"Hazardous Substances" or "Hazardous or Toxic Waste" – for the purposes of this permit, any liquid, solid, or contained gas that contain properties that are dangerous or potentially harmful to human health or the environment. See also 40 CFR §261.2.

"Historic Property" – as defined in the National Historic Preservation Act regulations, means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

"Impaired Water"– a water identified by the state, tribe, or EPA as not meeting an applicable water quality standard and (1) requires development of a TMDL (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1).

"Impervious Surface" – for the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

"Indian Country" or "Indian Country Lands" – defined at 40 CFR §122.2 as:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

"Infeasible" – for the purpose of this permit, infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices. EPA notes that it does not intend for any permit requirement to conflict with state water rights law.

"Install" or "Installation" – when used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

"Jar test" – a test designed to simulate full-scale coagulation/flocculation/sedimentation water treatment processes by taking into account the possible conditions.

"Landward" – positioned or located away from a waterbody, and towards the land.

"Large Construction Activity" – defined at 40 CFR § 122.26(b)(14)(x) and incorporated here by reference. Large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Linear Construction Site" – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

"Minimize" – to reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

"Mining Activity" – for the purposes of this permit, includes mining-related construction activities defined at 40 CFR 122.26(b)(14)(x) and 122.26(b)(15)(i), and active mining activities defined at 40 CFR 122.26(b)(14)(iii). Both of these sub categories of activities include earth-disturbing activities, with the latter also including such activities as: extraction, removal or recovery, and beneficiation of mined material from the earth; removal of overburden and waste rock to expose mineable material; and site reclamation and closure activities.

"Mining Operations" – for the purposes of this permit, mining operations are grouped into two distinct categories, with distinct effluent limits and requirements applicable to each: 1) earth-disturbing activities conducted prior to active mining activities; and 2) active mining activities, which includes reclamation.

"Municipal Separate Storm Sewer System" or "MS4" – defined at 40 CFR §122.26(b)(8) as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special

districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"National Pollutant Discharge Elimination System" (NPDES) – defined at 40 CFR §122.2 as the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. The term includes an 'approved program.'

"Native Topsoil" – the uppermost layer of naturally occurring soil for a particular area, and is often rich in organic matter, biological activity, and nutrients.

"Natural Buffer" – for the purposes of this permit, an area of undisturbed natural cover surrounding waters of the U.S. within which construction activities are restricted. Natural cover includes the vegetation, exposed rock, or barren ground that exists prior to commencement of earth-disturbing activities.

"Natural Vegetation" – vegetation that occurs spontaneously without regular management, maintenance, or species introductions or removals, and that generally has a strong component of native species.

"New Operator of a Permitted Site" – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site".

"New Site" – a site where construction activities commenced on or after February 16, 2017.

"New Source" – for the purposes of this permit, a construction project that commenced construction activities after February 1, 2010.

"New Source Performance Standards (NSPS)" – for the purposes of this permit, NSPS are technology-based standards that apply to construction sites that are new sources under 40 CFR 450.24.

"Non-Stormwater Discharges" – discharges that do not originate from storm events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

"Non-Turbid" – a discharge that does not cause or contribute to an exceedence of turbidity-related water quality standards.

"Notice of Intent" (NOI) – the form (electronic or paper) required for authorization of coverage under the Construction General Permit.

"Notice of Termination" (NOT) – the form (electronic or paper) required for terminating coverage under the Construction General Permit.

"NPDES eReporting Tool" (NeT) – EPA's online system for submitting electronic Construction General Permit forms.

"Operational" – for the purposes of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

"Operator" – for the purposes of this permit and in the context of stormwater discharges associated with construction activity, any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications *(e.g. in most cases this is the owner of the site)*; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (*e.g., they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor of the project)*.

This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of stormwater associated with construction activity. Subcontractors generally are not considered operators for the purposes of this permit.

"Ordinary High Water Mark" – 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.

"Permitting Authority" – for the purposes of this permit, EPA, a Regional Administrator of EPA, or an authorized representative.

"Point(s) of Discharge" – see "Discharge Point."

"Point Source" – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, 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. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

"Pollutant" – defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

"Pollution Prevention Controls" – stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

"Polymers" – for the purposes of this permit, coagulants and flocculants used to control erosion on soil or to enhance the sediment removal capabilities of sediment traps or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum chloride, and gypsum.

"Prohibited Discharges" – discharges that are not allowed under this permit, including:

1. Wastewater from washout of concrete;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

4. Soaps or solvents used in vehicle and equipment washing;
5. Toxic or hazardous substances from a spill or other release; and
6. Waste, garbage, floatable debris, construction debris, and sanitary waste.

"Provisionally Covered Under this Permit" – for the purposes of this permit, EPA provides temporary coverage under this permit for emergency-related projects prior to receipt of a complete and accurate NOI. Discharges from earth-disturbing activities associated with the emergency-related projects are subject to the terms and conditions of the permit during the period of temporary coverage.

"Qualified Person" – a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

"Receiving Water" – a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

"Run-On" – sources of stormwater that drain from land located upslope or upstream from the regulated site in question.

"Semi-Arid Areas" – areas with an average annual rainfall of 10 to 20 inches.

"Shared Control" - for the purposes of this permit, a stormwater control, such as a sediment basin or pond, used by two or more operators that is installed and maintained for the purpose of minimizing and controlling pollutant discharges from a construction site with multiple operators associated with a common plan of development or sale. Any operators that are contributing stormwater from their construction activities to a shared control are considered to rely upon a shared control.

"Small Construction Activity" – defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Small Residential Lot" – for the purpose of this permit, a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

"Snowmelt" – the conversion of snow into overland stormwater and ground water flow as a result of warmer temperatures.

"Spill" – for the purpose of this permit, the release of a hazardous or toxic substance from its container or containment.

"Stabilization" – the use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

"Steep Slopes" – where a state, tribe, local government, or industry technical manual (e.g., stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

"Storm Sewer System" – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) designed or used for collecting or conveying stormwater.

"Stormwater" – stormwater runoff, snowmelt runoff, and surface runoff and drainage.

"Stormwater Control" - refers to any best management practice or other method (including narrative effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

"Stormwater Discharge Associated with Construction Activity" – as used in this permit, a discharge of pollutants in stormwater to waters of the United States from areas where earth-disturbing activities (e.g., clearing, grading, or excavation) occur, or where construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants), are located.

"Stormwater Inlet" – a structure placed below grade to conduct water used to collect stormwater runoff for conveyance purposes.

"Stormwater Team" – the group of individuals responsible for oversight of the development and modifications of the SWPPP, and oversight of compliance with the permit requirements. The individuals on the "Stormwater Team" must be identified in the SWPPP.

"Storm Event" – a precipitation event that results in a measurable amount of precipitation.

"Storm Sewer" – a system of pipes (separate from sanitary sewers) that carries stormwater runoff from buildings and land surfaces.

"Subcontractor" – for the purposes of this permit, an individual or company that takes a portion of a contract from the general contractor or from another subcontractor.

"SWPPP" (Stormwater Pollution Prevention Plan) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes stormwater controls to reduce or eliminate pollutants in stormwater discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of this general permit.

"Temporary Stabilization" – a condition where exposed soils or disturbed areas are provided temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

"Thawing Conditions" – for the purposes of this permit, thawing conditions are expected based on the historical likelihood of two or more days with daytime temperatures greater than 32˚F. This date can be determined by looking at historical weather data. Note: the estimation of thawing conditions is for planning purposes only. During construction the permittee will be required to conduct site inspections based upon actual conditions (i.e., if thawing conditions occur sooner than expected, the permittee will be required to conduct inspections at the regular frequency).

"Threatened Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

"Tier 2 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(2), those waters that are characterized as having water quality that exceeds the levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

"Tier 2.5 Waters" – for antidegradation purposes, those waters designated by states or tribes as requiring a level of protection equal to and above that given to Tier 2 waters, but less than that given Tier 3 waters. Some states have special requirements for these waters.

"Tier 3 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(3), Tier 3 waters are identified by states as having high quality waters constituting an Outstanding National Resource Water (ONRW), such as waters of National Parks and State Parks, wildlife refuges, and waters of exceptional recreational or ecological significance.

"Total Maximum Daily Load" or "TMDL" – the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measure.

"Toxic Waste" – see "Hazardous Substances."

"Treatment Chemicals" – polymers, flocculants, or other chemicals used to reduce turbidity in stormwater.

"Turbidity" – a condition of water quality characterized by the presence of suspended solids and/or organic material.

"Uncontaminated Discharge" – in the context of authorized non-stormwater discharges, a discharge that does not cause or contribute to an exceedance of applicable water quality standards.

"Upland" – the dry land area above and 'landward' of the ordinary high water mark.

"Upset" – Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

"Water-Dependent Structures" – structures or facilities that are required to be located directly adjacent to a waterbody or wetland, such as a marina, pier, boat ramp, etc.

"Water Quality Standards" – defined in 40 CFR § 131.3, and are provisions of state or federal law which consist of a designated use or uses for the waters of the United States, water quality criteria for such waters based upon such uses, and an antidegradation policy to protect high-quality waters. Water quality standards protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

"Waters of the United States" – see definition at 40 CFR 122.2.

"Wetland" – those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. On-site evaluations are typically required to confirm the presence and boundaries of wetlands.

Acronyms

ACHP – Advisory Council on Historic Preservation

BMP – Best Management Practice

CBI – Confidential Business Information

CGP – Construction General Permit

CFR – Code of Federal Regulations

CWA – Clean Water Act

CZMA – Coastal Zone Management Act

ECHO – EPA Enforcement and Compliance History Online

ELG – Effluent Limitations Guideline

EPA – United States Environmental Protection Agency

ESA – Endangered Species Act

FR – Federal Register

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi-Sector General Permit

NEPA – National Environmental Policy Act

NeT – NPDES eReporting Tool

NHPA – National Historic Preservation Act

NMFS – United States National Marine Fisheries Service

NPDES – National Pollutant Discharge Elimination System

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

NRC – National Response Center

NRCS – National Resources Conservation Service

NSPS – New Source Performance Standards

ONRW – Outstanding National Resource Water

PAM – Polyacrylamide

POTW – Publicly Owned Treatment Works

RUSLE – Revised Universal Soil Loss Equation

SDS – Safety Data Sheet

SHPO – State Historic Preservation Office

SPCC – Spill Prevention Control and Countermeasure

SWPPP – Stormwater Pollution Prevention Plan

THPO – Tribal Historic Preservation Office

TMDL – Total Maximum Daily Load

TSS – Total Suspended Solids

UIC – Underground Injection Control

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

WQS – Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage and EPA Regional Addresses

Permit coverage for stormwater discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits.

B.1 EPA Region 1

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 1:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
CTR10I000	Indian country within the State of Connecticut
MAR100000	Commonwealth of Massachusetts (except Indian country)
MAR10I000	Indian country within the State of Massachusetts
NHR100000	State of New Hampshire
RIR10I000	Indian country within the State of Rhode Island
VTR10F000	Areas in the State of Vermont subject to construction by a Federal Operator
01R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 1 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 1 Address:

U.S. EPA Region 1
Office of Ecosystem Protection
Stormwater and Construction Permits Section
5 Post Office Square, Suite 100
(OEP 06-1)
Boston, MA 02109-3912

B.2 EPA Region 2

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 2:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR10I000	Indian country within the State of New York
PRR100000	Commonwealth of Puerto Rico
02R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 2 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 2 Address:

For Puerto Rico:
U.S. EPA Region 2
Caribbean Environmental Protection Division
NPDES Stormwater Program
City View Plaza II – Suite 7000
48 Rd. 165 Km 1.2
Guaynabo, PR 00968-8069

For New York:
U.S. EPA Region 2
NPDES Stormwater Program
290 Broadway, 24th Floor
New York, NY 10007-1866

B.3 EPA Region 3

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 3:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
DCR100000	District of Columbia
DER10F000	Areas in the State of Delaware subject to construction by a Federal Operator
VAR10I000	Indian country within the State of Virginia
03R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 3 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 3 Address:

U.S. EPA Region 3
Office of NPDES Permits and Enforcement
NPDES Permits Branch, Mailcode 3WP41
1650 Arch Street
Philadelphia, PA 19103

B.4 EPA Region 4

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 4:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ALR10I000	Indian country within the State of Alabama
FLR10I000	Indian country within the State of Florida
MSR10I000	Indian country within the State of Mississippi
NCR10I000	Indian country within the State of North Carolina
04R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program (except Catawba lands in South Carolina)

For stormwater discharges in EPA Region 4 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 4 Address:

U.S. EPA Region 4
Water Protection Division
NPDES Stormwater Program
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303-3104

B.5 EPA Region 5

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 5:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
MIR10I000	Indian country within the State of Michigan
MNR10I000	Indian country within the State of Minnesota
WIR10I000	Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community
05R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 5 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 5 Address:

U.S. EPA Region 5
NPDES Program Branch
77 W. Jackson Blvd.
Mail Code WN16J
Chicago, IL 60604-3507

B.6 EPA Region 6

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 6:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
LAR10I000	Indian country within the State of Louisiana
NMR100000	State of New Mexico, except Indian country
NMR10I000	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10I000 and Ute Mountain Reservation Lands that are covered under Colorado permit COR10I000.
OKR10I000	Indian country within the State of Oklahoma
OKR10F000	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
	pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR10F000	Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR10I000	Indian country within the State of Texas
06R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 6 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 6 Address:

U.S. EPA Region 6
NPDES Stormwater Program (WQ-PP)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

B.7 EPA Region 7

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 7:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
IAR10I000	Indian country within the State of Iowa
KSR10I000	Indian country within the State of Kansas
NER10I000	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)
07R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 7 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 7 Address:

U.S. EPA Region 7
NPDES Stormwater Program
11201 Renner Blvd
Lenexa, KS 66219

B.8 EPA Region 8

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 8:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
COR10F000	Areas in the State of Colorado, except those located on Indian country, subject to construction activity by a Federal Operator
COR10I000	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR10I000	Indian country within the State of Montana
NDR10I000	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10I000 listed below)
SDR10I000	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10I000 listed above)
UTR10I000	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR10I000	Indian country within the State of Wyoming
08R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 8 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 8 Address:

EPA Region 8 Storm Water Program
Mailcode: 8P-W-WW
1595 Wynkoop Street
Denver, CO 80202-1129

B.9 EPA Region 9

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 9:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ASR100000	Island of American Samoa
AZR10I000	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR10I000	Indian country within the State of California
GUR100000	Island of Guam
JAR100000	Johnston Atoll
MPR100000	Commonwealth of the Northern Mariana Islands
MWR100000	Midway Island and Wake Island
NVR10I000	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah
09R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 9 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 9 Address:

U.S. EPA Region 9
Water Division
NPDES Stormwater Program (WTR-2-3)
75 Hawthorne Street
San Francisco, CA 94105-3901

B.10 EPA Region 10

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 10:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
AKR10I000	Indian country lands as defined in 18 U.S.C. 1151 within the State of Alaska
AKR10F000	Denali National Park and Preserve
IDR100000	State of Idaho, except Indian country
IDR10I000	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR10I000	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR10F000	Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator
WAR10I000	Indian country within the State of Washington

For stormwater discharges in EPA Region 10 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 10 Address:

U.S. EPA Region 10
NPDES Stormwater Program
1200 6th Avenue (OWW-191)
Seattle, WA 98101-3140

Appendix C - Small Construction Waivers and Instructions

These waivers are only available to stormwater discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

C.1 Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than five during the period of construction activity. The operator must certify to EPA that construction activity will occur only when the rainfall erosivity factor is less than five. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the CGP have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

> *Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.*

EPA has developed an online rainfall erosivity calculator to help small construction sites determine potential eligibility for the rainfall erosivity waiver. You can access the calculator from EPA's website at: https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites. The R factor can easily be calculated by using the construction site latitude/longitude or address and estimated start and end dates of construction. This calculator may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver. Use this online calculator or the Construction Rainfall Erosivity Waiver Fact Sheet (https://www.epa.gov/sites/production/files/2015-10/documents/fact3-1.pdf) to assist in determining the R Factor for your small construction site.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you can submit a rainfall erosivity waiver electronically via EPA's NPDES eReporting Tool (NeT) (https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting), unless you received a waiver from your EPA Regional Office (see Part 1.4.1 of the CGP for information about receiving a waiver from electronic reporting).

> *Note: If the R factor is five or greater, you do not qualify for the rainfall erosivity waiver, and must obtain coverage under an NPDES permit (e.g., the CGP), unless you qualify for the Water Quality Waiver as described in section B below.*

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five, you must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of your records. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is five or above, you must obtain NPDES permit coverage.

C.2 TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern for the impaired water and has determined that controls on stormwater discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any waterbody that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at https://www.epa.gov/tmdl and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA-established or approved TMDL, you must provide the following information in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the TMDL.

C.3 Equivalent Analysis Waiver

This waiver is available for discharges to non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his/her small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);

2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the equivalent analysis.

C.4 Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.
2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of stormwater associated with small construction activity, provided you qualify for the waiver. Any discharge of stormwater associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must obtain NPDES permit coverage. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Regional Office address specified in Appendix B.

See page three for instructions

Form Approved OMB No. 2040-0004

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Low Erosivity Waiver (LEW) Certification

This form provides notice to EPA that you, the project operator identified in Section II of this form, are certifying that construction activity at the project site identified in Section III, will take place during a period when the rainfall erosivity factor is less than five [40 CFR 122.26(b)(15)(i)(A)]. By submitting a complete and accurate form, the otherwise applicable NPDES permitting requirements for stormwater discharges associated with construction activity, are waived. Based on your certification, a waiver is granted for the period beginning on the date this Low Erosivity Waiver Form is mailed to EPA (i.e., postmark date), or the project start date specified in Part IV of this form, whichever shall occur last, and ending on the project completion date specified in Part IV. Refer to the instructions at the end of this form for more details.

I. Approval to Use Paper Form

Have you been granted a waiver from electronic reporting from the Regional Office *? ☐ YES ☐ NO

If yes, check which waiver you have been granted, the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver:

Date approval obtained: / /

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper Low Erosivity Waiver Certification form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

II. Operator Information

Operator Name:

Are you requesting coverage under this NOI as a "federal operator" as defined in Appendix A? ☐ YES ☐ NO

Mailing Address:

Street:

City: State: Zip Code: -

County or Similar Government Division:

Phone: - - Ext.

Email:

Operator Point of Contact Information:

First Name, Middle Initial, Last Name:

Title:

III. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location:

City: State: ZIP Code: -

County or Similar Government Subdivision:

For the project/site you are seeking a wavier for permit coverage, provide the following information:

Latitude/Longitude (Use decimal degrees and specify method):

Latitude: ___ ___. ___ ___ ___ ___° N (decimal degrees) Longitude: ___ ___ ___. ___ ___ ___ ___° W (decimal degrees)

Latitude/Longitude Data Source: ☐ Map ☐ GPS ☐ Other ___________________ Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☐ WGS 84

- Is your project/site located in Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ YES ☐ NO

  If yes, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property:

- Is the project located in the State of Oklahoma and associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171)? ☐ Yes ☐ No
- Is the project located in the State of Oklahoma and associated with agricultural production, services and silviculture (includes SIC Groups 01, 02, 07, 08 and 09)? ☐ Yes ☐ No
- Is the project located in the State of Texas and associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation or crude oil or natural gas by pipeline? ☐ Yes ☐ No

Estimated Area to be Disturbed (to the nearest quarter acre): |_|_|_|_|.|_|_|

IV. Rainfall Erosivity Factor Calculation Data

Estimated Project Start Date: |_|_| / |_|_| / |_|_|_|_| Estimated Project Completion Date: |_|_| / |_|_| / |_|_|_|_|

Rainfall erosivity factor (R factor): ___.___ ___

Note: To qualify for this waiver, the construction activity must take place during a period when the R factor is less than five.

Rainfall erosivity factor was calculated by using: ☐ Online calculator ☐ EPA Fact Sheet 3-1 ☐ USDA Handbook 703

Are interim non-vegetative site stabilization measures used to establish the project completion date for purposes of obtaining this waiver? ☐ Yes ☐ No

V. Certification Information

I certify under penalty of law that: (1) construction activity at the project or site specified in Part II shall disturb less than five acres and shall take place during a period when the rainfall erosivity factor is less than five, (2) final stabilization will be completed as defined in the Construction General Permit, and (3) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, if interim non-vegetative measures are used to establish the end of the construction period for the purposes of obtaining this waiver, I commit to periodically inspect and properly maintain the area until the criteria for final vegetative stabilization have been met.

First Name, Middle Initial, Last Name:

Title:

Signature: ______________________________ Date: |_|_| / |_|_| / |_|_|_|_|

Email:

Instructions for Completing EPA Form 7500-62 (Rev. 2/17)

Low Erosivity Waiver Certification

NPDES Form

Form Approved OMB No. 2040-0004

Who May Qualify for a Low Erosivity Waiver

Under the National Pollutant Discharge Elimination System (NPDES) Program, operators of construction projects that result in land disturbances equal to or greater than one acre, including sites that are less than one acre but are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, are required to obtain coverage under an NPDES permit for stormwater discharges associated with construction activity. EPA may waive the otherwise applicable permit requirements for stormwater discharges from construction activities that disturb less than five acres if the construction activity will take place during a period when the rainfall erosivity factor (R factor) is less than five. More information on the low erosivity waiver is available on the web in the Construction Rainfall Erosivity Waiver Fact Sheet at https://www.epa.gov/npdes/construction-rainfall-erosivity-waiver-fact-sheet and can be accessed from https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites. For questions related to completion of this form, you may contact EPA's Notice of Intent Processing Center toll free at 1-866-352-7755.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. **Please submit the original document with signature in ink - do not send a photocopied signature.**

Section I. Approval to Use Paper Low Erosivity Waiver Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper Low Erosivity Waiver form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See https://www.epa.gov/npdes/contact-us-stormwater#regional for a list of EPA Regional Office contacts.

Section II. Operator Information

Each legal entity that meets EPA's definition of "operator" (see definitions in Appendix A of EPA's NPDES Construction General Permit) and that meets the eligibility conditions for the low erosivity waiver must file this form to have the permit requirements waived. The operator is any party associated with a construction activity that meets either of the following two criteria: (1) the party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) the party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit). It is possible that there will be more than one operator at a site and, in such cases, each entity that meets the operator definition must complete a Low Erosivity Waiver Certification. Provide the legal name of your firm, public organization, or other entity that operates the project described in this waiver certification. Usually this will be a company or organization's name but for construction activities undertaken by you as an individual, this should be your name.

Indicate whether you are seeking a wavier for permit coverage under this permit as a "federal operator" as defined in Appendix A.

Also provide the operator's mailing address, country, telephone number, and e-mail address for someone who can answer questions about the site (e.g., a project or site manager). Enter a point of contact (if different from the operator's name).

Section III. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project lacks a street address, indicate the general location of the site (e.g., intersection of State Highways 61 and 34).

Provide the latitude and longitude of your facility in decimal degrees format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and web-based siting tools, among others. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. For linear construction sites, the measurement should be taken midpoint of the site. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian tribe, and if so, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property. Answer the other three questions on projects located in Oklahoma and Texas. This information is used to determine whether EPA is the permitting authority for the construction project, and thus has authority to waive the otherwise applicable requirements of the Construction General Permit.

Enter the area (estimated to the nearest quarter acre) to be disturbed including, but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Note: 1 acre = 43,560 sq. ft.

Section IV. Rainfall Erosivity Factor Calculation Data

The construction period begins with the initial earth disturbance and ends with final site stabilization. To qualify for this waiver, the rainfall erosivity factor for the project must be less than five during the entire construction period. Specify the construction period by entering the project start date (date of initial earth disturbance) and project completion date (date of final site stabilization). For example, a grading contractor that is operating on-site for only one week during a nine month construction project, must enter the start date and completion date of the entire nine month construction period.

Where the environmental threat is low (i.e., in arid and semi-arid climates), "final stabilization" can include techniques that employ re-vegetation combined with other stabilization measures, consisting of temporary degradeable rolled erosion control products, also known as "erosion control blankets (ECBs). With proper selection, design, and installation of the combination re-vegetation/ECB technique in arid or semi-arid areas, an operator can be considered to have achieved final stabilization upon completion of the installation process. Note that if more than three years is required to establish 70 percent of the cover that is provided by vegetation native to local undisturbed area, this technique cannot be used or cited for fulfillment of the final stabilization requirement. If your waiver is based on use of interim non-vegetative stabilization measures, such as erosion control blankets, to establish the end of the construction

Low Erosivity Waiver Certification

period, you must indicate so on this form. In doing so, you must commit and certify (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization, as defined in the Construction General Permit, have been met.

The rainfall erosivity factor "R" is determined in accordance with the U.S. Department of Agriculture *Agriculture Handbook Number 703, Prediciting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)*, Chapter 2 pages 21-64, dated January 1997. EPA's Construction Rainfall Erosivity Waiver Fact Sheet (EPA 833-F-00-014), available online at https://www3.epa.gov/npdes/pubs/fact3-1.pdf defines rainfall erosivity and provides numerical examples showing how to calculate your rainfall erosivity factor. You may use the fact sheet approach or the online rainfall erosivity factor calculator available at: https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites to calculate your rainfall erosivity factor for your project.

If the R factor is five or greater during the project’s construction period, you must have or obtain coverage under an NPDES stormwater permit. If the project was eligible for the waiver during the original construction period, but the construction activity will extend past the project completion date specified in the Low Erosivity Waiver Certification, the operator must recalculate the R factor using the original start date and a new project completion date. If the recalculated R factor is still less than five, a new waiver certification form must be submitted before the end of the original construction period. If the new R factor is five or greater, the operator must submit a Notice of Intent to be covered by the Construction General Permit before the original project completion date. The Notice of Intent (NOI) form may be submitted electronically using EPA’s NPDES eReporting Tool (NeT) at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting. If the EPA Regional Office grants you a waiver from electronic reporting, you may submit a paper NOI form available on the EPA website at https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents.

Section V. Certification Information

All Low Erosivity Waiver Certification forms must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public facility: By either a principal executive officer or ranking elected official. For purposes of this Section, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the signature date. An unsigned or undated Low Erosivity Waiver Certification will not be considered valid.

Where to File This Form

Low Erosivity Waiver Certification forms must be sent to one of the following two addresses.

Regular U.S. Mail Delivery	Overnight/Express Mail Delivery
EPA Stormwater Notice Processing Center Mail Code 4203M Attn: 2017 CGP U.S. EPA 1200 Pennsylvania Avenue, NW Washington, DC 20460	EPA Stormwater Notice Processing Center Room 7420 Attn: 2017 CGP U.S. EPA 1201 Constitution Avenue, NW Washington, DC 20004

Please submit the original form with a signature in ink. Do not send a photocopied signature!

Paperwork Reduction Act Notice

Public reporting burden for this certification form is estimated to average 1.0 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Strategies Branch (2822T), U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Appendix D - Eligibility Procedures Relating to Threatened and Endangered Species Protection

In accordance with Part 1.1.5 of the CGP, you must follow the procedures in this appendix to determine your eligibility under one of the criteria in Part D.1 of this appendix with respect to the protection of federally listed threatened or endangered species and federally designated "critical habitat" [hereinafter "threatened and endangered species"] under the Endangered Species Act (ESA) from discharges and discharge-related activities authorized under this permit. If you do not meet one of these criteria, you are not eligible for coverage under this permit.

While coordination between you and the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS)(together, the "Services") is not necessarily required in all cases, EPA encourages you to coordinate with the Services, to document that coordination, and to do so early in the planning process prior to submitting your NOI.

This appendix is organized as follows:

- **Part D.1:** Threatened and Endangered Species Protection Eligibility Criteria
- **Part D.2:** Procedures for Determining Which Threatened and Endangered Species Protection Criteria Applies

D.1 Threatened and Endangered Species Protection Eligibility Criteria

You must certify in your NOI that you meet one of the eligibility criteria listed below in order to be eligible for coverage under this permit. Once you determine the applicable eligibility criterion, you must:

- Specify the basis for your selection of the applicable eligibility criterion, and if required, provide documentation that is the basis for your determination with the NOI form; and
- Provide documentation in your SWPPP that is sufficient to support your determination that you satisfy the requirements of the applicable criterion.

The definition of "action area," which is contained in Appendix A, is repeated below for convenience.

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. For the purposes of this permit and for application of the Endangered Species Act requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as listed amphibians) are found in the ditch, swale, or gully.)
- The areas where stormwater from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls. (Example: Where a stormwater retention pond would be built.)

Criterion A. No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of this permit, you certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of this permit.

Basis statement content: A basis statement supporting the selection of this criterion should identify the USFWS and NMFS information sources used. Attaching aerial image(s) of the site to this NOI is helpful to EPA, USFWS, and NMFS in confirming eligibility under this criterion. Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.

Criterion B. Eligibility requirements met by another operator under the 2017 CGP. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your "action area" under eligibility Criterion A, C, D, E, or F of the 2017 CGP and you have confirmed that no additional ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS not considered in the that certification may be present or located in the "action area." To certify your eligibility under this criterion, there must be no lapse of NPDES permit coverage in the other CGP operator's certification. By certifying eligibility under this criterion, you agree to comply with any conditions upon which the other CGP operator's certification was based. You must include in your NOI the NPDES ID from the other 2017CGP operator's notification of authorization under this permit. If your certification is based on another 2017 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in criterion C in your NOI form.

Basis statement content: A basis statement supporting the selection of this criterion should identify the eligibility criterion of the other CGP NOI, the authorization date, and confirmation that the authorization is effective.

Criterion C. Discharges not likely to adversely affect ESA-listed species and/or designated critical habitat. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to adversely affect ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.

Criterion D. Coordination with USFWS and/or NMFS has successfully concluded. Coordination between you and the USFWS and/or NMFS has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS, and resulted in a written concurrence from USFWS and/or NMFS that your site's discharges and discharge-related activities are not likely to adversely affect listed species and/or critical habitat. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies participated in coordination, the field office/regional office(s) providing that coordination, and the date that coordination concluded.

Criterion E. ESA Section 7 consultation has successfully concluded. Consultation between a Federal Agency and the USFWS and/or NMFS under section 7 of the ESA has concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, Indicate the result of the consultation:

I. biological opinion from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

II. written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat.

You must include copies of the correspondence between yourself and the USFWS and/or NMFS in your SWPPP and this NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify the federal action agencie(s) involved, the field office/regional office(s) providing that consultation, any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the consultation was completed.

Criterion F. Issuance of section 10 permit. Potential take is authorized through the issuance of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of the site's discharges and discharge-related activities on ESA-listed species and designated critical habitat. You must include copies of the correspondence between yourself and the participating agencies in your SWPPP and your NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies provided a section 10 permit, the field office/regional office(s) providing permit(s), any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the permit was granted.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility criteria in this section to remain eligible for coverage under this permit. Documentation of these requirements must be kept as part of your SWPPP (see Part 7.2.9.a).

NMFS will, within 14 days of submission of the NOI, advise EPA whether it believes the planned discharges meet the eligibility criteria of not likely to adversely affect NMFS Listed Resources of Concern, whether the eligibility criterion could be met with additional conditions; or whether the eligibility criterion is not met. With respects to ESA issues, EPA recognizes NMFS expertise and will carefully consider NMFS' determination in identifying eligibility for authorization, either with or without additional conditions. In the event NMFS has placed a hold on your NOI, EPA will notify you as to whether your discharges are authorized or whether an individual permit will be required. If you do not hear from EPA within 14 days, you may assume that your discharge is authorized without further conditions.

D.2 Procedures for Determining Which Threatened and Endangered Species Protection Criterion Applies

You must follow the procedures in this Part to determine the criterion listed above under which your site is eligible for permit coverage.

D.2.1 Step 1 - Determine if Your Discharges and Discharge-Related Activities Were Already Addressed in Another Operator's Valid Certification that Included Your Action Area.

- **If your discharges and discharge-related activities <u>were</u> already addressed in another operator's valid certification that included your action area** (e.g., a general contractor or developer may have completed and filed an NOI for the entire action area with the necessary ESA certifications (Criterion A, C, D, E, or F)), *you may select eligibility Criterion B on your NOI form*.

  By certifying eligibility under Criterion B, you must comply with any terms and conditions imposed under the eligibility requirements of the criterion for which the other operator has established eligibility (either Criterion A, C, D, E, or F) to ensure that your discharges and discharge-related activities are protective of listed species and/or critical habitat.

  > *Note: If you are unable to meet these eligibility requirements, then you may either establish eligibility under one of the other criterion, or you may consider applying to EPA for an individual permit.*

  Under Criterion B, you must provide documentation in your SWPPP of any of these terms and conditions, as well as the other operator's basis for establishing eligibility. You must also provide a description of the basis for your selection of Criterion B on your NOI form, including the eligibility criterion (A, C, D, E, or F) that was certified to by the other operator, and must provide the NPDES ID from the other operator's notification of authorization under this permit.

  If your certification is based on another operator's certification under criterion C, you must provide the documentation required in the NOI for criterion C, namely: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles).

- **If discharges and discharge-related activities from your site <u>were not</u> addressed in another operator's valid certification that included your action area,** you must follow the applicable procedures in Steps 2 through 5 below.

D.2.2 Step 2 - Determine if Listed Threatened or Endangered Species or their Designated Critical Habitat(s) are Likely to Occur in your Site's Action Area

You must determine, to the best of your knowledge, whether species listed as either threatened or endangered, or their critical habitat(s) (see definitions of these terms in Appendix A), are located in your site's action area. To make this determination, you should first determine if listed species and/or critical habitat are expected to exist in your county or township. The U.S. Fish and Wildlife Service and National Marine Fisheries Service maintain lists of federally listed endangered or threatened species on their internet sites.

- For National Marine Fisheries Service species and critical habitat information, use the following webpages, which provide up-to-date information on listed species (http://www.nmfs.noaa.gov/pr/species/esa/) and critical habitat (http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm). To determine the field office that corresponds to your site, go to http://www.nmfs.noaa.gov/ (under the left tab for "Regions").

  For National Marine Fisheries Service species in the Greater Atlantic Region, go to https://www.greateratlantic.fisheries.noaa.gov/protected/index.html.

- For Fish and Wildlife Service species information, use the on-line mapping tool IPaC (the Information, Planning, and Consultation System) located at http://ecos.fws.gov/ipac/, and follow these steps:
    - Select Get Started
    - Select Enter Project Location
    - Use an address, city name or other location to zoom into your project area
    - Use the zoom feature to see the entire extent of your action area on the screen
    - Use one of the mapping features (e.g., Polygon or line feature) to draw your action
- When you are done, press *Continue*.
- Select Request an Official Species List
- Complete the fields on the Official Species List Request page, and include "(CGP)" at the end of the project description. – For Classification, select "Water Quality Modification".
- Select the appropriate requesting agency/organization type (for most dischargers, this should be "Other").
- Submit the request to acquire an Official Species List, which should show both listed species as well as any designated critical habitat that are present in the action area in the previous step.
- *Note: If a link to an Official Species List is not available on the page, follow the web link of the office(s) indicated, or contact the office directly by mail or phone if a web link is not shown.*
- ***If listed species and/or critical habitat may exist in your action area, you must do one or more of the following***:
    - Conduct visual inspections. This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal stormwater collection systems.
    - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive stormwater discharges, biological surveys may be an appropriate way to assess whether species are located in the action area and whether there are likely to be adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms.
    - If required, conduct an environmental assessment under the National Environmental Policy Act (NEPA). Some construction activities might require review under NEPA for specific reasons, such as federal funding or other federal involvement in the project. Note: Coverage under the CGP does not trigger such a review for individual projects/sites. EPA has complied with NEPA in the issuance of the CGP.

      and

  - Follow the instructions in Steps 3 – 5 below, as applicable. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

- ***If there are <u>no</u> listed species and <u>no</u> critical habitat areas in your action area,*** *you may check eligibility criterion A on your NOI form*. You must also provide a description of the basis for the criterion selected on your NOI form and provide documentation supporting the criterion selected in your SWPPP.

D.2.3 **Step 3 -** Determine if the Construction Activity's Discharges or Discharge-Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat

If in Step 2 you determine that listed species and/or critical habitat could exist in your action area, you must next assess whether your discharges or discharge-related activities are likely to adversely affect listed threatened or endangered species or designated critical habitat.

Potential adverse effects from discharges and discharge-related activities include:

- *Hydrological*. Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity, or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a stormwater discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.
- *Habitat*. Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of stormwater controls, may adversely affect listed species or their habitat. Stormwater may drain or inundate listed species habitat.
- *Toxicity*. In some cases, pollutants in stormwater may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you should contact the appropriate Services office for assistance.

- ***If adverse effects to listed threatened or endangered species or their critical habitat <u>are not</u> likely****, then you may select eligibility criterion C on the NOI form*. You must provide the following specific information on your NOI form: 1) the federally listed species and/or designated habitat are located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also provide a copy of your site map with your NOI.
- ***If adverse effects to listed threatened or endangered species or their critical habitat <u>are</u> likely,*** you must follow Step 4 below.

D.2.4 **Step 4 -** Determine if Measures Can Be Implemented to Avoid Adverse Effects

If you make a preliminary determination in Step 3 that adverse effects from your construction activity's discharges or discharge-related activities are likely to occur, you can still receive coverage under eligibility criterion C of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage.

These measures may involve relatively simple changes to construction activities such as re-routing a stormwater discharge to bypass an area where species are located, relocating stormwater controls, or by modifying the "footprint" of the construction activity. If you are unable to ascertain which measures to implement to avoid the likelihood of adverse effects, you must coordinate or enter into consultation with the Fish and Wildlife Service and/or National Marine Fisheries Service, in which case you would not be eligible for coverage under eligibility criterion C, but may instead be eligible for coverage under eligibility criterion D, E, or F (described in more detail in Step 5).

- **If you are able to install and implement appropriate measures to avoid the likelihood of adverse effects,** *then you may check eligibility criterion C on the NOI form.* The measures you adopt to avoid or eliminate adverse effects must be implemented for the duration of the construction project and your coverage under the CGP. You must also provide a description of the basis for the criterion selected, and the following specific information on your NOI form: 1) the federally listed species and/or designated habitat are located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles).
- **If you cannot ascertain which measures to implement to avoid the likelihood of adverse effects,** you must follow the procedures in Step 5**.**

D.2.5 **Step 5 -** Determine if the Eligibility Requirements of Criterion D, E, or F Can Be Met

If in Step 4 you cannot ascertain which measures to implement to avoid the likelihood of adverse effects, you must contact the Fish and Wildlife Service and/or the National Marine Fisheries Service. You may still be eligible for CGP coverage if likely adverse effects can be addressed through meeting criterion D, E, or F.

- **Criterion D:** Coordination between you and the Services has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat.

  If you have met the requirements of criterion D, *you may select eligibility criterion D on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between you and the applicable Service in your SWPPP.

- **Criterion E:** Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either (1) a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or (2) written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

For more information on section 7 consultation, see 50 CFR §402. If you receive a "jeopardy opinion," you may continue to work with the Fish and Wildlife Service and/or National Marine Fisheries Service and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

Note that most consultations are accomplished through informal consultation. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify the Services of your intention and agreement to conduct consultation as a non-federal representative.

Consultation may also occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation).

Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

Whether ESA section 7 consultation must be performed with either the Fish and Wildlife Service, National Marine Fisheries Service, or both Services depends on the listed species that may be affected by the operator's activity. In general, the National Marine Fisheries Service has jurisdiction over marine, estuarine, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

If you have met the requirements of criterion E, *you may select eligibility criterion E on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

- **Criterion F:** Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat.

  You must follow Fish and Wildlife Serivce and/or National Marine Fisheries Service procedures when applying for an ESA section 10 permit (see 50 CFR §17.22(b)(1) for Fish and Wildlife Service and §222.22 for National Marine Fisheries Service). Application instructions for section 10 permits can be obtained from http://www.fws.gov and http://www.nmfs.noaa.gov or by contacting the appropriate Service office.

  If you have met the requirements of criterion F, *you may select eligibility criterion F on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

Appendix E – Historic Property Screening Process

Background

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of Federal "undertakings", such as the issuance of this permit, on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. To address any issues relating to historic properties in connection with the issuance of this permit, EPA developed the screening process in this appendix that enables construction operators to appropriately consider the potential impacts, if any, of their installation of stormwater controls on historic properties and to determine whether actions can be taken, if applicable, to mitigate any such impacts. Although the coverages of individual construction sites under this permit do not constitute separate Federal undertakings, the screening process in this appendix provides an appropriate site-specific means of addressing historic property issues in connection with EPA's issuance of the permit.

Key Terms

Historic property- prehistoric or historic districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and remains that are related to and located within such properties

SHPO – The State Historic Preservation Officer for a particular state

THPO or Tribal representative – The Tribal Historic Preservation Officer for a particular tribe or, if there is no THPO, the representative designated by such tribe for NHPA purposes

Instructions for All Construction Operators

You are required to follow the screening process in this appendix to determine if your installation of stormwater controls on your site has the potential to cause effects to historic properties, and whether or not you need to contact your SHPO, THPO, or other tribal representative for further information. **You may not submit your NOI until you have completed this screening process.** The following four steps describe how applicants can meet the historic property requirements under this permit:

Step 1 *Are you installing any stormwater controls that require subsurface earth disturbance?*[1]

The first step of the screening process is to determine if you will install stormwater controls that cause subsurface earth disturbance. The installation of the following types of stormwater controls require subsurface earth disturbance:[2]

- Dikes
- Berms
- Catch Basins
- Ponds
- Ditches

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[1] You are only required to consider earth-disturbing activities related to the installation of stormwater controls in the NHPA screening process. You are not reqired to consider other earth-disturbing activities at the site. If you are installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, your stormwater controls have the potential to have an effect on historic properties. If this is the case, then you must proceed to Step 2.

[2] This list is not intended to be exhaustive. Other stormwater controls that are not on this list may involve earth-disturbing activities and must also be examined for the potential to affect historic properties.

- Trenches
- Culverts
- Channels
- Perimeter Drains
- Swales

If you are not installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, then you may indicate this on your NOI, and no further screening is necessary. During the 14-day waiting period after submitting your NOI, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional controls to address adverse effects to historic properties are necessary.

Step 2 *Have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances precluded the existence of historic properties?*

If you are installing a stormwater control that requires subsurface earth disturbance, you must next determine if no historic properties exist on your site based on prior professional cultural resource surveys or other evaluations, or if the existence of historic properties has been precluded because of prior earth disturbances.

If prior to your project it has already been determined that no historic properties exist at your site based on available information, including information that may be provided by your applicable SHPO, THPO, or other tribal representative, then you may indicate this on your NOI, and no further screening steps are necessary. Similarly, if prior earth disturbances have eliminated the possibility that historic properties exist on your site, you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If neither of these circumstances exists for your project, you must proceed to Step 3.

Step 3 *If you are installing any stormwater controls that require subsurface earth disturbance, you must determine if these activities will have an effect on historic properties.*

If your answer to the question in Step 2 is “no”, then you must assess whether your earth-disturbing activities related to the installation of stormwater controls will have an effect on historic properties. This assessment may be based on historical sources, knowledge of the area, an assessment of the types of earth-disturbing activities you are engaging in, considerations of any controls and/or management practices you will adopt to ensure that your stormwater control-related earth-disturbing activities will not have an effect on historic properties, and any other relevant factors. If you determine based on this assessment that earth disturbances related to the installation of your stormwater controls will have no effect on historic properties, you may indicate this on your NOI, and document the basis for your determination in your SWPPP, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If none of the circumstances in Steps 1 - 3 exist for your project, you must proceed to Step 4.

Step 4: *If you are installing any stormwater controls that require subsurface earth disturbance and you have not satisfied the conditions in Steps 1 - 3, you must contact and consult with the appropriate historic preservation authorities.*

Where you are installing stormwater controls that require subsurface earth disturbance, and you cannot determine in Step 3 that these activities will have no effect on historic properties, then you must contact the relevant SHPO, THPO, or other tribal representative to request their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of these controls.

> *Note: Addresses for SHPOs and THPOs may be found on the Advisory Council on Historic Preservation's website (www.achp.gov/programs.html). If a tribe does not have a THPO, you should contact the appropriate tribal government office designated by the tribe for this purpose.*

You must submit the following minimum information in order to properly initiate your request for information:

1. Project name (*i.e.*, the name or title most commonly associated with your project);
2. A narrative description of the project;
3. Name, address, phone and fax number, and email address (if available) of the operator;
4. Most recent U.S. Geological Survey (USGS) map section (7.5 minute quadrangle) showing actual project location and boundaries clearly indicated; and
5. Sections of the SWPPP site map (see Part 7.2.4) that show locations where stormwater controls that will cause subsurface earth disturbance will be installed (see Step 1).

Without submitting this minimum information, you will not have been considered to have properly initiated your request. You will need to provide the SHPO, THPO, or other tribal representative **a minimum of 15 calendar days** after they receive these materials to respond to your request for information about your project.

If you do not receive a response within 15 calendar days after receipt by the SHPO, THPO, or other tribal representative of your request, then you may indicate this on your NOI, and no further screening steps are necessary. Or, if the applicable SHPO, THPO, or other tribal representative responds to your request with an indication that no historic properties will be affected by the installation of stormwater controls at your site, then you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If within 15 calendar days of receipt of your request the applicable SHPO, THPO, or other tribal representative responds with a request for additional information or for further consultation regarding appropriate measures for treatment or mitigation of effects on historic properties caused by the installation of stormwater controls on your site, you must comply with this request and proceed to Step 5.

Step 5: *Consultation with your applicable SHPO, THPO, or other tribal representative.*

If, following your discussions with the appropriate historic preservation authorities in Step 4, the applicable SHPO, THPO, or tribal represenative requests additional information or further consultation, you must respond with such information or consult to determine impacts to historic properties that may be caused by the installation of stormwater controls on your site and appropriate measures for treatment or mitigation of such impacts. If as a result of your discussions with the applicable SHPO, THPO, or tribal representative, you enter into, and comply with, a written agreement regarding treatment and/or mitigation of impacts on your site, then you may indicate this on your NOI, and no further screening steps are necessary.

If, however, agreement on an appropriate treatment or mitigation plan cannot be reached between you and the SHPO, THPO, or other tribal representative within 30 days of your response to the SHPO, THPO, or other tribal representative's request for additional information or further consultation, you may submit your NOI, but you must indicate that you have not negotiated measures to avoid or mitigate such effects. You must also include in your SWPPP the following documentation:

1. Copies of any written correspondence between you and the SHPO, THPO, or other tribal representative; and
2. A description of any significant remaining disagreements as to mitigation measures between you and the SHPO, THPO, or other tribal representative.

After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, ACHP or other tribal representative may request that EPA place a hold on authorization based upon concerns regarding potential adverse effects to historic properties. EPA, in coordination with the ACHP, will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

Appendix F - List of Tier 3, Tier 2, and Tier 2.5 Waters

EPA's CGP has special requirements for discharges to waters that receive Tier 2, Tier 2.5, or Tier 3 protections for antidegradation purposes. See Parts 1.1.8 and 3.2.

EPA's antidegradation regulation, at 40 CFR 131.12, provides a framework for maintaining and protecting water quality for: (1) existing uses (known as "Tier 1"); (2) high quality waters by establishing a process for authorizing the lowering of water quality where existing water quality exceeds levels needed to support propagation of fish, shellfish, and wildlife and recreation in and on the water (known as "Tier 2"); and (3) for Outstanding National Resource Waters (known as "Tier 3"). While EPA's antidegradation regulation only outlines three levels of antidegradation protection, some states and tribes include an additional level of antidegradation protection between Tier 2 and Tier 3 (sometimes known as "Tier 2.5").

High quality (Tier 2) waters may be identified on a parameter-by-parameter basis or on a water body-by-water body basis consistent with the requirements of 40 CFR 131.12(a)(2). States and tribes using a parameter-by-parameter basis (sometimes called a "pollutant-by-pollutant approach") do not maintain a list of Tier 2 waters, but instead identify a high quality water at the time an entity proposes an activity that would lower water quality. In contrast, states and tribes using a water body-by-water body basis typically identify high quality waters in advance on a list by weighing a variety of factors (*e.g.*, chemical, physical, biological, and other information) to classify a water body's overall quality.

The list below is provided as a resource for operators who must determine whether they discharge to a Tier 2, Tier 2.5, or Tier 3 water. Where available, the table lists waters specifically identified for Tier 2, Tier 2.5, or Tier 3 protection by a water quality standard authority (*e.g.*, a state or tribe). Operators should not assume that a water does not receive Tier 2, Tier 2.5, or Tier 3 protection solely based on the absence of information in this table. Evaluation regarding antidegradation protections for a specific water may need to be done on a case-by-case basis, especially where the state or tribe uses the parameter-by-parameter approach to identify whether water quality is better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

Permit Number	**Areas of Coverage/Where EPA Is Permitting Authority**	
MAR100000	**Commonwealth of Massachusetts, except Indian Country lands**	
	Tier 2, Tier 2.5, and 3 waters are identified and listed in the Massachusetts Water Quality Standards 314 CMR 4.00. Surface water qualifiers that correspond with Tier classifications are defined at 314 CMR 4.06(1)(d)m and listed in tables and figures at the end of 314 CMR 4.06. See MassDEP's web page at: http://www.mass.gov/eea/agencies/massdep/water/regulations/314-cmr-4-00-mass-surface-water-quality-standards.html. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-massachusetts	
	Tier 2	Listed as "High Quality Waters", and all wetlands that are not designated as an Outstanding Resource Water.
	Tier 2.5	Listed as "Outstanding Resource Water", "Public Water Supply", "Tributary to Public Water Supply", all wetlands bordering Outstanding Resource Waters, and vernal pools.
	Tier 3	Defined as "Special Resource Water". Note: No waters have been identified as a Special Resource Water as of the issuance of this permit.

<table>
<tr><th>Permit Number</th><th colspan="2">Areas of Coverage/Where EPA Is Permitting Authority</th></tr>
<tr><td rowspan="3">NHR100000</td><td colspan="2">State of New Hampshire</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a parameter-by-parameter basis. Tier 2.5 and 3 waters are identified and listed in the New Hampshire Water Quality Standards CHAPTER Env-Wq 1700. Description of the antidegradation tiers are included at CHAPTER Env-Wq 1708 and listed in the tables at. New dischargers and new sources should contact EPA Region 1's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-new-hampshire</td></tr>
<tr><td>Tier 3</td><td>Env-Ws 1708.05(a) Surface waters of national forests and surface waters designated as "natural" under RSA 483:7-a, I shall be considered outstanding resource waters (ORW). "Natural waters" are listed at http://www.gencourt.state.nh.us/rsa/html/L/483/483-15.htm. Surface waters of national forests are not included in an official list. For further questions, new dischargers and new sources should contact EPA Region 1's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional.</td></tr>
<tr><td rowspan="3">NYR10I000</td><td colspan="2">Saint Regis Mohawk Tribe (NY)</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Saint Regis Mohawk Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 2's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See:
https://www.epa.gov/sites/production/files/2014-12/documents/stregis-tribe.pdf</td></tr>
<tr><td>Tier 3</td><td>Outstanding Resource Waters. Those waters designated as such by the Tribe. The Waters that may be considered for designation as Outstanding Resource Waters include, but are not limited to, water bodies that are recognized as: (i) Important because of protection through official action, such as Tribal, Federal or State law, Presidential or secretarial action, international treaty, or interstate compact; (ii) Having exceptional recreational significance; (iii) Having exceptional ecological significance; (iv) Having other special environmental, recreational, religious or ecological attributes; or waters whose designation as Outstanding Resource Waters is reasonably necessary for the protection of other waters so designated. New dischargers and new sources should contact EPA Region 2's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional.</td></tr>
</table>

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
PRR100000	**Commonwealth of Puerto Rico**	
	Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Puerto Rico Water Quality Standards. New dischargers and new sources should contact EPA Region 2's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-puerto-rico	
	Tier 3	Tier III waters are those which are classified as either Class SA or Class SE. Class SA waters are defined as "Coastal waters and estuarine waters of high quality and/or exceptional ecological or recreational value whose existing characteristics shall not be altered, except by natural causes, in order to preserve the existing natural phenomena." Class SA waters include bioluminiscent lagoons and bays such as La Parguera and Monsio José on the Southern Coast, Bahía de Mosquito in Vieques, and any other coastal or estuarine waters of exceptional quality of high ecological value or recreational which may be designated by Puerto Rico, through Resolution, as requiring this classification for protection of the waters. Class SE waters are defined as "Surface waters and wetlands of exceptional ecological value, whose existing characteristics should not be altered in order to preserve the existing natural phenomena." Class SE waters include Laguna Tortuguero, Laguna Cartagena and any other surface water bodies of exceptional ecological value as may be designated by Puerto Rico through Resolution.
DCR100000	**District of Columbia**	
	New dischargers and new sources should contact EPA Region 3's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. Tier 2.5 waters are identified and listed in the District of Columbia Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-washington-dc	
	Tier 2.5	Rule 1102.4 SPECIAL WATERS OF THE DISTRICT OF COLUMBIA (SWDC): Any segment or segments of the surface waters of the District that are of water quality better than needed for the current use or have scenic or aesthetic importance shall be designated as Special Waters of the District of Columbia (SWDC). Rock Creek and its tributaries and Battery Kemble Creek and its tributaries are considered Special Waters of the District of Columbia (SWDC) under its antidegradation program.
FLR10I000	**Miccosukee Tribe (FL)**	
	New dischargers and new sources should contact EPA Region 4's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. The Miccosukee Tribe Water Quality Standards includes an additional tier of protection between Tier 2 and 3 that is referred as Tier 2 ¾ for Outstanding Miccosukee Waters. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-miccosukee-tribe-indians-florida	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	Tier 2 ¾	Outstanding Miccosukee Waters (OMW): The Miccosukee Tribe recognizes that the waters of its Federal Reservation which are contained within Water Conservation Area 3-A and the Miccosukee Reserved Area constitute the Tribe's highest quality waters and must be preserved in as pristine a condition as possible while at the same time allowing for the activities of man. These ecologically important waters are essential to the survival of the Miccosukee Tribe, therefore: The Miccosukee Tribe hereby designates the waters of its Federal Reservation which are contained within Water Conservation Area 3-A (North Grass, South Grass, Gap) and Miccosukee Reserved Area as Class III-A and Outstanding Miccosukee waters (OMW). The North Grass is defined as that area bounded by the northern boundary of the reservation, the eastern edge of the L-28 levee (which is east of the L-28 canal), the southern edge of the C-60 Canal, and the eastern boundary of the reservation. The South Grass is defined as the area bounded by southern edge of the C-60 canal, the eastern boundary of the reservation, the southern boundary of the reservation, the eastern edge of the L-28 canal (which is south of the L-28 Tieback Canal), a line running north from the L-28 Canal (where the L-28 Canal turns northwest to become the L-28 Tieback Canal) until this line intersects the oil pipeline, the center of the oil pipeline until the oil pipeline intercepts the L-28 Interceptor Canal, and the eastern edge of the L-28 levee (which is east of the L-28 Canal). The Gap is defined as that area which is bounded by the southern boundary of the reservation, the western boundary of the reservation, the northeastern edge of the L-28 Interceptor Canal, the oil pipeline which runs generally south from the L-28 Interceptor Canal until the pipeline intercepts a line running north from the L-28 Canal where the L-28 canal turns northwest to become the L-28 Tieback Canal, and the eastern edge of the L-28 canal (which is south of the L-28 Tieback Canal).
	Tier 3	Tier 3: Outstanding Natural Resource Waters (ONRW): Where high quality waters constitute an Outstanding Tribal resource such as waters of parks and wildlife refuges and waters of exceptional ecological and recreational significance, that water quality shall be maintained and protected. These waters shall be designated as Outstanding Natural Resource Waters (ONRW). Currently, no Tribal waters are designated as ONRW.
	Seminole Tribe (FL)	
	New dischargers and new sources should contact EPA Region 4's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/sites/production/files/2014-12/documents/seminole_floridawqs.pdf	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
MNR10I000	**Fond du Lac Band of MN Chippewa**	
	Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Fond du Lac Band of MN Chippewa Water Quality Standards. New dischargers and new sources should contact EPA Region 5's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-fond-du-lac-band-minnesota-chippewa-tribe	
	Tier 3	Six Lakes are presently identified as Tier 3/Outstanding Reservation Resource Waters (ORRW): (1) Dead Fish Lake; (2) Jaskari Lake; (3) Miller (Mud) Lake; (4) Perch Lake; (5) Rice Portage Lake; (6) Wild Rice Lake.
	Grand Portage Band of MN Chippewa	
	Tier 2 waters are identified on a parameter-by-parameter basis. Two subcategories of protection (referred to as outstanding tribal water resource (OTWR)) exist in the Grand Portage Band of MN Chippewa Water Quality Standards as follows: (a) OTWR-Restricted (lowered water quality may be allowed under limited circumstances); (b) OTWR-Prohibited (Discharges and permanent lowering of water quality are prohibited). New dischargers and new sources should contact EPA Region 5's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-grand-portage-band-minnesota-chippewa-tribe	
	Tier 2	OTWR-Restricted: All waters, not already classified as Tier 3, are high quality Tier 2 waters (see Grand Portage Reservation Water Quality Standards, Section VI & VII, Pages 14-16).
	Tier 3	OTWR-Prohibited: "The portion of Lake Superior north of latitude 47 degrees, 57 minutes, 13 seconds, east of Hat Point, south of the Minnesota-Ontario boundary, and west of the Minnesota-Michigan boundary" (see Section VII, Page 16).
WIR10I000	**Bad River Band of Lake Superior Chippewa (WI)**	
	Tier 2 waters are identified on a water body-by-water body basis. Tier 2, 2.5, and 3 classifications are included in the Bad River Band of Lake Superior Chippewa Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-bad-river-band-lake-superior-chippewa-tribe	
	Tier 2	Any surface water not specifically classified as Outstanding Tribal Resource Water or Outstanding Resource Water is classified as Exceptional Resource Water (Anishinaabosibiing).
	Tier 2.5	Outstanding Resource Waters: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek.

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	Tier 3	Outstanding Tribal Resource Waters: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.
	Lac du Flambeau Band of the Lake Superior Chippewa	
	Tier 2 waters are identified on a water body-by-water body basis. Tier 2, 2.5, and 3 classifications are included in the Lac du Flambeau Band of the Lake Superior Chippewa Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-lac-du-flambeau-band-lake-superior-chippewa-tribe	
	Tier 2	All named waters, including wetlands, not specified under an Antidegradation classification are classified as Tribal Resource Water (Tier 2). Unclassified Named Waters (Tier 2): Buckskin Lake; Flambeau Lake; Long (Interlaken) Lake); Marland's Lake (Sec. 13, T40NR4E); Moss Lake; Pokegema Lake.
	Tier 2.5	Exceptional Tribal Resource Waters: Bills Lake, Birch Lake, Bobidosh Lake, Bog Lake (SE SE Sec. 31, T40NR6E), Bolton Lake, Broken Bow Lake, Chewalah Lake, Clear Lake (Sec. 2, T39NR4E), Corn Great, Great, Corn Lake, Little "Least/Lesser", Crawling Stone Lake, Big, Crawling Stone Lake, Little, Crescent Lake, Crooked Lake, Big, David Lake, Ellerson Lake, Middle, Ellerson Lake, West, Elsie Lake "Boundary Lake", Fat Lake, Fence Lake, Gresham Creek, Green Lake (NW NW Sec. 19, T41R6E), Grey Lake, Gunlock Lake, Haskell Lake, Headflyer Lake (Sec. 19, T41NR5E), Highway Lake (NW NW Sec. 19, T41NR5E), Horsehead Lake (SE SW Sec. 9, T40NR5E), Hutton's Creek, Ike Walton Lake, Lily Lake (SE SW Sec. 35, T40NR5E), Little Ten Lake, Lodge Lake "L. Rice" (NW NW Sec. 8, T41NR6E), Lucy Lake, Mindys Lake (Sec. 8, T40NR5E), Minette Lake, Mitten Lake, Monk's Lake (Sec. 13, T40NR5E), Moving Cloud Lake, Mud Creek, Muskesin Lake, Patterson Lake, Placid Twin Lake (North), Placid Twin Lake (South), Plummer Lake, Poupart Lake, Prairie Lake (NE SW Sec. 13, T40NR4E), Raven Lake, Ross Allen Lake, Sand Lake, Little, Scott Lake (Sec. 22, T40N, R4E), Shishebogama Lake, Signal Lake, Snort Lake (Sec. 5, T41N, R6E), Spring Lake "Jerms", Squirrel Lake, Statenaker Lake "Hollow", Stearns Lake "Hourglass", Sugarbush "Hidden Lake" (NW NW Sec. 17, T41NR5E), Sugarbush Creek, Sugarbush Lake, Little, Sugarbush Lake, Lower, Sugarbush Lake, Middle, Sugarbush Lake, Upper, Sunfish Lake, Tippecanoe Lake, Tomahawk River, To-To Tom Lake, Toulish Lake, Trout River, Warrior Lake, White Sand Lake, Whitefish Lake "Cattail Lake" (Sec. 34, T40N5R), Wishow Lake, Wyandock Lake.
	Tier 3	Outstanding Tribal Resource Waters: Bear River (1st bridge to Reservation boundary), Big Springs (Sec. 25, T40NR4E), Black Lake, Cranberry Lake, Doud Lake, Eagle Lake, Gene Lake, Johnson Springs, Little Trout Lake, Lost Lake (Sect. 1, T41NR4E), Mishonagon Creek, Munnomin (Jesse, Duck) Lake, Negani (Hegani) Lake, Reservation Line Lake, Spring Creek, Tank Lake, Thomas Lake, Wild Rice Lake, Zee Lake.

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
NMR100000	**State of New Mexico**	
	Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the State of New Mexico Water Quality Standards. New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-new-mexico	
	Tier 2	If you need assistance determining if your discharge is to a Tier 2 waterbody, please contact the NMED Surface Water Quality Bureau's Stormwater Program at https://www.env.nm.gov/swqb/StormWater/index.html.
	Tier 3	See https://www.env.nm.gov/swqb/ONRW/ for current list of NMED's Tier 3/Outstanding National Resource Waters. See also New Mexico's Water Quality Standards at 20.6.4.9.D NMAC.
NMR10I000	**Ohkay Owingeh (NM) (formerly the Pueblo of San Juan)**	
	New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-ohkay-owingeh-pueblo-formerly-pueblo-san-juan	
	Pueblo of Acoma (NM)	
	New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-acoma	
	Pueblo of Isleta (NM)	
	New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-isleta	
	Pueblo of Nambe (NM)	
	New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-nambe	
	Pueblo of Picuris (NM)	
	New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. Tier 2, 2.5, and 3 classifications are included in the Pueblo of Picuris Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-picuris	

<table>
<tr><th>Permit Number</th><th colspan="2">Areas of Coverage/Where EPA Is Permitting Authority</th></tr>
<tr><td rowspan="13"></td><td colspan="2">Pueblo of Pojoaque (NM)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-pojoaque</td></tr>
<tr><td colspan="2">Pueblo of Sandia (NM)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-sandia</td></tr>
<tr><td colspan="2">Pueblo of Santa Ana (NM)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-santa-ana</td></tr>
<tr><td colspan="2">Pueblo of Santa Clara (NM)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-santa-clara</td></tr>
<tr><td colspan="2">Pueblo of Taos (NM)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-taos</td></tr>
<tr><td>Tier 3</td><td>Outstanding Tribal Resource Waters: Mountain Lakes; Mountain Streams & Springs;</td></tr>
<tr><td colspan="2">Pueblo of Tesuque (NM)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 6's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-tesuque</td></tr>
<tr><td rowspan="2">COR10I000</td><td colspan="2">Ute Mountain Ute Tribe</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Ute Mountain Ute Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:</td></tr>
</table>

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	https://www.epa.gov/wqs-tech/water-quality-standards-regulations-ute-mountain-ute-tribe	
	Tier 3	Outstanding Tribal Resource Waters: 1. Ute Spring and unnamed creek from Ute Spring downstream within Section 12, TWP35N R18W (Colorado). 2. Allen Canyon Creek, Sections 17, 20, 29, 30, 31, TWP 35S, R21E (Utah) 3. "Lopez" Spring and unnamed creek tributary to and downstream from the spring, within Section 35, TWP 34N, R18W
MTR10I000	**Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation (MT)**	
	Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-assiniboine-and-sioux-tribes-fort-peck-indian	
	Tier 2	Most Tribal Waters will qualify as Tier 2 waters. Unless the water body is not attaining the Clean Water Act Section 101(a)(2) goals, the water body has received an OTRW designation, or there is no assimilative capacity for pollutants to protect existing and designated uses, it is likely that the water body will receive Tier 2 protection.
	Confederated Salish and Kootenai Tribes of the Flathead Reservation (MT)	
	Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Confederated Salish and Kootenai Tribes of the Flathead Reservation Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-salish-and-kootenai-tribes-flathead	
	Tier 3	The following are Tier 3 waters: All waters located within Tribally designated primitive or wilderness areas.
	Northern Cheyenne (MT)	
	Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Northern Cheyenne Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-northern-cheyenne-tribe-northern-cheyenne-reservation	
ASR100000	**Island of American Samoa**	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/sites/production/files/2014-12/documents/aswqs.pdf	

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<tr><th>Permit Number</th><th colspan="2">Areas of Coverage/Where EPA Is Permitting Authority</th></tr>
<tr><td rowspan="10">AZR10I000</td><td colspan="2">Hopi Tribe (AZ)</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Hopi Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-hopi-tribe</td></tr>
<tr><td>Tier 3</td><td>Unique Waters: In the Moencopi Wash watershed, from Blue Canyon Springs to the confluence of Begashibito Wash.</td></tr>
<tr><td colspan="2">Hualapai Indian Tribe (AZ)</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Hualapai Indian Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-hualapai-tribe</td></tr>
<tr><td>Tier 3</td><td>Segments assigned as Tier 3: Spencer; Meriwhitica; Willow Spring; Upper Milkweed Spring; Bridge Canyon; Travertine Spring; Travertine Falls; Diamond Creek; Diamond Creek Spring; Blue Mountain; Metuck; Peach Springs Spring; Westwater; Clay Tank; Hocky Puck; Pocamote Spring; Mohawk Spring; Granite Spring; Three Spring; Warm Spring; Honga Spring; National Canyon Spring; National Canyon; Moss Spring.</td></tr>
<tr><td colspan="2">Navajo Nation (AZ, NM, UT)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-navajo-nation</td></tr>
<tr><td colspan="2">White Mountain Apache Tribe (AZ)</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a water body-by-water body basis. Tier classifications are identified in Appendix B of the White Mountain Apache Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-white-mountain-apache-tribe</td></tr>
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Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	Tier 2	High Quality Waters: East Fork White River, above R52 Road; Paradise Creek, above Wohlenberg; Ord Creek; Smith Cienega; Bull Cienega; Smith Creek; Big Bonito; Tonto Creek, below Y47 Crossing; Crooked Creek; Boggy Creek; Little Bonito Creek, above Y55 Crossing; Flash Creek; Squaw Creek; Hurricane Lake; Hurricane Creek; Hughey Creek; Bonito Cienega; West Fork Black River; Hall Cienega; Purcell Cienega; Thompson Creek; Cibecue Creek in Box Canyon to Salt river; Rock Springs Creek; Willow Creek (Lower Canyon Cr.). Sensitive Waters (treated the same manner as Tier 2): East Fork White River below R52 Road, above Rock Cr; Lofer Cienega Creek; Carrizo Creek above Corduroy; Cedar Creek; Big Canyon (E. Cedar Creek); Middle Cedar Creek; West Cedar Creek; Cibecue Creek, Box Canyon up to Confluence with Salt Creek; Spring Creek; Salt Creek; Cibecue Creek, from confluence w/Salt Cr. To Big Springs; Cibecue Creek, above Big Springs; Salt Draw; Canyon Creek S. of Chediski Farms; Oak Creek; Canyon Creek, N. of Chediski Farms.
	Tier 3	Outstanding Waters: East Fork White River, in Wilderness area; Pumpkin Lake.
CAR10I000	**Big Pine Band of Owens Valley (CA)**	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-big-pine-paiute-tribe-owens-valley	
	Hoopa Valley Tribe (CA)	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-hoopa-valley-tribe	
	Paiute-Shoshone Indians of the Bishop Community (CA)	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-bishop-paiute-tribe	
	Twenty-Nine Palms (CA)	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-twenty-nine-palms-band-mission-indians	

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<tr><th>Permit Number</th><th colspan="2">Areas of Coverage/Where EPA Is Permitting Authority</th></tr>
<tr><td rowspan="2">GUR100000</td><td colspan="2">Island of Guam</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/sites/production/files/2014-12/documents/aswqs.pdf</td></tr>
<tr><td rowspan="2">JAR100000</td><td colspan="2">Johnston Atoll</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional</td></tr>
<tr><td rowspan="2">MPR100000</td><td colspan="2">Commonwealth of the Northern Mariana Islands</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/sites/production/files/2014-12/documents/aswqs.pdf</td></tr>
<tr><td rowspan="2">MWR100000</td><td colspan="2">Midway Island and Wake Island</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional</td></tr>
<tr><td rowspan="2">NVR10000I</td><td colspan="2">Pyramid Lake Paiute (NV)</td></tr>
<tr><td colspan="2">New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pyramid-lake-paiute-tribe</td></tr>
<tr><td rowspan="3">IDR100000</td><td colspan="2">State of Idaho</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the State of Idaho Water Quality Standards. New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-idaho</td></tr>
<tr><td>Tier 2 and Tier 3</td><td>For Tier 2 and Tier 3 waters, please consult the most recent approved version of Idaho's Idaho Integrated Report, available at: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report/ and the closest regional office of the Idaho Department of Environmental Quality: http://www.deq.idaho.gov/regional-offices-issues/.</td></tr>
<tr><td rowspan="2">IDR10I000</td><td colspan="2">Coeur D'Alene Tribe (ID)</td></tr>
<tr><td colspan="2">Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Coeur D'Alene Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
https://www.epa.gov/wqs-tech/water-quality-standards-regulations-coeur-dalene-tribe-indians</td></tr>
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Permit Number	Areas of Coverage/Where EPA Is Permitting Authority
ORR10I000	**Confederated Tribes of the Warm Springs Reservation (OR)**
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-warm-springs-indian-reservation
	Confederated Tribes of Umatilla (OR)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-umatilla-indian-reservation-oregon
WAR10I000	**Confederated Tribes of the Chehalis Reservation (WA)**
	Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Confederated Tribes of the Chehalis Reservation Water Quality Standards. New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-chehalis-reservation
	Confederated Tribes of the Colville Reservation (WA)
	EPA established federal water quality standards for the Confederated Tribes of the Colville Reservation at 40 CFR 131.35. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-colville-reservation
	Kalispel Indian Community (WA)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-kalispel-indian-community-kalispel-reservation
	Lummi Tribe (WA)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-lummi-nation
	Makah Indian Nation (WA)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also:
	https://www.epa.gov/wqs-tech/water-quality-standards-regulations-makah-indian-nation

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority
	Port Gamble S'Klallam (WA)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-port-gamble-sklallam-tribe
	Puyallup Tribe of Indians (WA)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-puyallup-tribe-indians
	Spokane Tribe of Indians (WA)
	New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-spokane-tribe-indians

Appendix G – Buffer Requirements

The purpose of this appendix is to assist you in complying with the requirements in Part 2.2.1 of the permit regarding the establishment of natural buffers and/or equivalent sediment controls. This appendix is organized as follows:

G.1 SITES THAT ARE REQUIRED TO PROVIDE AND MAINTAIN NATURAL BUFFERS AND/OR EQUIVALENT EROSION AND SEDIMENT CONTROLS

The requirement in Part 2.2.1 to provide and maintain natural buffers and/or equivalent erosion and sediment controls applies for any discharges to waters of the U.S. located within 50 feet of your site's earth disturbances. If the water of the U.S. is not located within 50 feet of earth-disturbing activities, Part 2.2.1 does not apply. See Figure G-1.

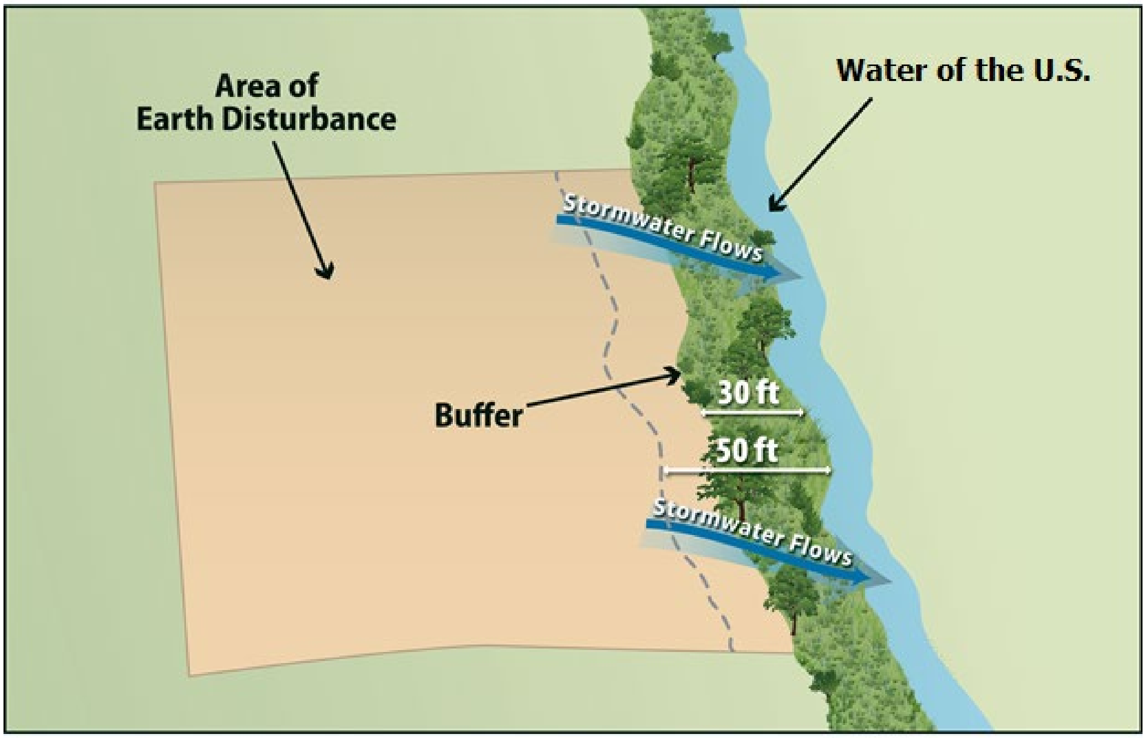

Figure G-1 Example of earth-disturbing activities within 50 feet of a water of the U.S.

G.2 COMPLIANCE ALTERNATIVES AND EXCEPTIONS

G.2.1 Compliance Alternatives

If Part 2.2.1 applies to your site, you have three compliance alternatives from which you can choose, unless you qualify for any of the exceptions (see below and Part 2.2.1.a):

1. Provide and maintain a 50-foot undisturbed natural buffer; or
2. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
3. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer. [1]

The compliance alternative selected must be maintained throughout the duration of permit coverage.

See Part G.2.2 below for exceptions to the compliance alternatives.

See Part G.2.3 for requirements applicable to providing and maintaining natural buffers under compliance alternatives 1 and 2 above.

See Part G.2.4 for requirements applicable to providing erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer under compliance alternatives 2 and 3 above.

G.2.2 Exceptions to the Compliance Alternatives

The following exceptions apply to the requirement to implement one of the Part 2.2.1.a compliance alternatives (see also Part 2.2.1.b):

- The following disturbances within 50 feet of a water of the U.S. are exempt from the requirements Part 2.2.1 and this Appendix:
    - Construction approved under a CWA Section 404 permit; or
    - Construction of a water-dependent structure or water access areas *(e.g., pier, boat ramp, trail)*.
- If there is no discharge of stormwater to waters of the U.S. through the area between the disturbed portions of the site and any waters of the U.S. located within 50 feet of your site, you are not required to comply with the requirements in Part 2.2.1 and this Appendix. This includes situations where you have implemented controls measures, such as a berm or other barrier, that will prevent such discharges.
- Where no natural buffer exists due to preexisting development disturbances *(e.g., structures, impervious surfaces)* that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in Part 2.2.1 and this Appendix.

  Where some natural buffer exists but portions of the area within 50 feet of the water of the U.S. are occupied by preexisting development disturbances, you are required to comply with the requirements in Part 2.2.1 and this Appendix. For the purposes of calculating the sediment load reduction for either compliance alternative 2 or 3, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances. Clarity about how to implement the compliance alternatives for these situations is provided in G.2.3 and G.2.4 below.

  If during your project, you will disturb any portion of these preexisting disturbances, the area removed will be deducted from the area treated as a "natural buffer."
- For "linear construction sites" (see Appendix A), you are not required to comply with this requirement if site constraints *(e.g., limited right-of-way)* make it infeasible to implement one of the Part 2.2.1.a compliance alternatives, provided that, to the extent feasible, you limit disturbances within 50 feet of any waters of the U.S. and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the U.S. You must also document in your SWPPP your rationale for why it is infeasible for you to implement one of the Part 2.2.1.a compliance alternatives, and describe any buffer width retained and supplemental erosion and sediment controls installed.
- For "small residential lot" construction *(i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential*

project that will ultimately disturb greater than or equal to 1 acre), you have the option of complying with one of the "small residential lot" compliance alternatives in Part G.3 of this appendix.

Note that you must document in your SWPPP if any disturbances related to any of the above exceptions occurs within the buffer area on your site.

G.2.3 Requirements for Providing and Maintaining Natural Buffers

This part of the appendix applies to you if you choose compliance alternative 1 (50-foot buffer), compliance alternative 2 (a buffer of < 50 feet supplemented by additional erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), or if you are providing a buffer in compliance with one of the "small residential lot" compliance alternatives in Part G.3.

Buffer Width Measurement

Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1. 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; or
2. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

Refer to Figure G-2 and Figure G-3. You may find that specifically measuring these points is challenging if the flow path of the water of the U.S. changes frequently, thereby causing the measurement line for the buffer to fluctuate continuously along the path of the waterbody. Where this is the case, EPA suggests that rather than measuring each change or deviation along the water's edge, it may be easier to select regular intervals from which to conduct your measurement. For instance, you may elect to conduct your buffer measurement every 5 to 10 feet along the length of the water.

Additionally, note that if earth-disturbing activities will take place on both sides of a water of the U.S. that flows through your site, to the extent that you are establishing a buffer around this water, it must be established on both sides. For example, if you choose compliance alternative 1, and your project calls for disturbances on both sides of a small stream, you would need to retain the full 50 feet of buffer on both sides of the water. However, if your construction activities will only occur on one side of the stream, you would only need to retain the 50-foot buffer on the side of the stream where the earth-disturbance will occur.

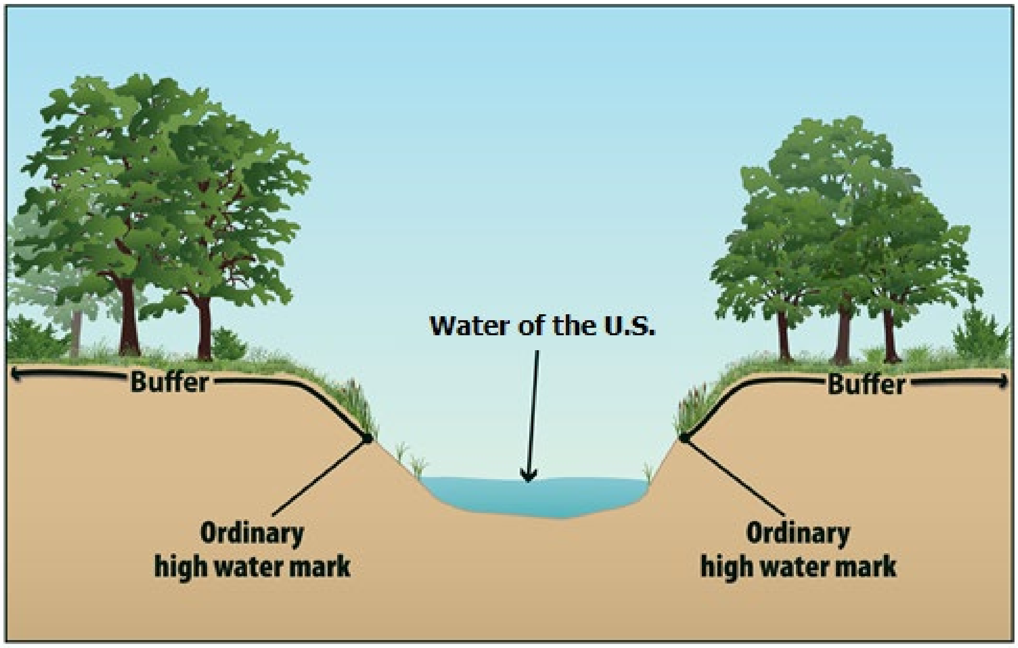

Figure G-2 Buffer measurement from the ordinary high water mark of the water body, as indicated by a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, and/or the presence of litter/debris.

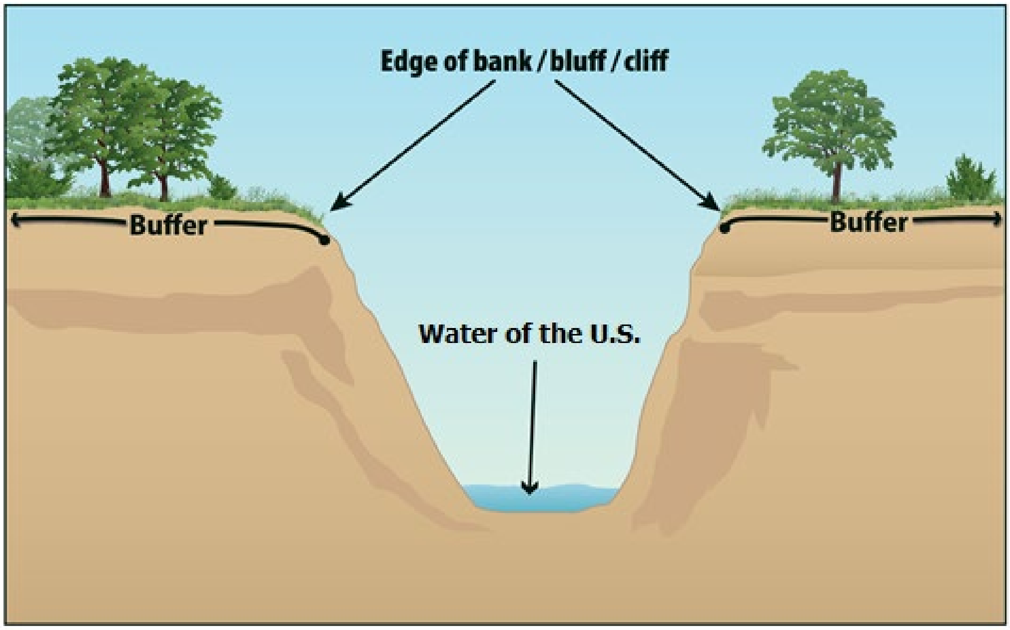

Figure G-3 Buffer measurement from the edge of the bank, bluff, or cliff, whichever is applicable.

Limits to Disturbance Within the Buffer

You are considered to be in compliance with the requirement to provide and maintain a natural buffer if you retain and protect from construction activities the natural buffer that existed prior to the commencement of construction. If the buffer area contains no vegetation prior to the commencement of construction (e.g., sand or rocky surface), you are not required to plant vegetation. As noted above, any preexisting structures or impervious surfaces may occur in the natural buffer provided you retain and protect from disturbance the buffer areas outside of the preexisting disturbance.

To ensure that the water quality protection benefits of the buffer are retained during construction, you are prohibited from conducting any earth-disturbing activities within the buffer during permit coverage. In furtherance of this requirement, **prior to commencing earth-disturbing activities on your site, you must delineate, and clearly mark off, with flags, tape, or a similar marking device, the buffer area on your site.** The purpose of this requirement is to make the buffer area clearly visible to the people working on your site so that unintended disturbances are avoided.

While you are not required to enhance the quality of the vegetation that already exists within the buffer, you are encouraged to do so where such improvements will enhance the water quality protection benefits of the buffer. (Note that any disturbances within the buffer related to buffer enhancement are permitted and do not constitute construction disturbances.) For instance, you may want to target plantings where limited vegetation exists, or replace existing vegetation where invasive or noxious plant species (see http://plants.usda.gov/java/noxiousDriver) have taken over. In the case of invasive or noxious species, you may want to remove and replace them with a diversity of native trees, shrubs, and herbaceous plants that are well-adapted to the climatic, soil, and hydrologic conditions on the site. You are also encouraged to limit the removal of naturally deposited leaf litter, woody debris, and other biomass, as this material contributes to the ability of the buffer to retain water and filter pollutants.

If a portion of the buffer area adjacent to the water of the U.S. is owned by another party and is not under your control, you are only required to retain and protect from construction activities the portion of the buffer area that is under your control. For example, if you comply with compliance alternative 1 (provide and maintain a 50-foot buffer), but 10 feet of land immediately adjacent to the water of the U.S. is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you must only retain and protect from construction activities the 40-foot buffer area that occurs adjacent to the property on which your construction activities are taking place. EPA would consider you to be in compliance with this requirement regardless of the activities that are taking place in the 10-foot area that is owned by a different party than the land on which your construction activities are taking place that you have no control over.

Discharges to the Buffer

You must ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls (*for example, you must comply with the Part 2.2.3 requirement to install sediment controls along any perimeter areas of the site that will receive pollutant discharges*), **and if necessary to prevent erosion caused by stormwater flows within the buffer, you must use velocity dissipation devices**. The purpose of this requirement is to decrease the rate of stormwater flow and encourage infiltration so that the pollutant filtering functions of the buffer will be achieved. To comply with this requirement, construction operators typically will use devices that physically dissipate stormwater flows so that the discharge entering the buffer is spread out and slowed down.

SWPPP Documentation

You are required to document in your SWPPP the natural buffer width that is retained. For example, if you are complying with alternative 1, you must specify in your SWPPP that you are providing a 50-foot buffer. Or, if you will be complying with alternative 2, you must document the reduced width of the buffer you will be retaining (and you must also describe the erosion and sediment controls you will use to achieve an equivalent sediment reduction, as required in Part G.2.4 below). Note that you must also show any buffers on your site map in your SWPPP consistent with Part 7.2.4.i. Additionally, if any disturbances related to the exceptions in Part G.2.2 occur within the buffer area, you must document this in the SWPPP.

G.2.4 Guidance for Providing the Equivalent Sediment Reduction as a 50-foot Buffer

This part of the appendix applies to you if you choose compliance alternative 2 (provide and maintain a buffer that is less than 50 feet that is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot buffer) or compliance alternative 3 (implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot buffer).

Determine Whether it is Feasible to Provide a Reduced Buffer

EPA recognizes that there will be a number of situations in which it will be infeasible to provide and maintain a buffer of any width. While some of these situations may exempt you from the buffer requirement entirely (see G.2.2), if you do not qualify for one of these exemptions, there still may be conditions or circumstances at your site that make it infeasible to provide a natural buffer. For example, there may be sites where a significant portion of the property on which the earth-disturbing activities will occur is located within the buffer area, thereby precluding the retention of natural buffer areas.

Therefore, you should choose compliance alternative 2 if it is feasible for you to retain some natural buffer on your site. (Note: For any buffer width retained, you are required to comply with the requirements in Part G.2.3, above, concerning the retention of vegetation and restricting earth disturbances.) Similarly, if you determine that it is infeasible to provide a natural buffer of any size during construction, you should choose alternative 3.

Design Controls That Provide Equivalent Sediment Reduction as 50-foot Buffer

You must next determine what additional controls must be implemented on your site that, alone or in combination with any retained natural buffer, achieve a reduction in sediment equivalent to that achieved by a 50-foot buffer.

Note that if only a portion of the natural buffer is less than 50 feet, you are only required to implement erosion and sediment controls that achieve the sediment load reduction equivalent to the 50-foot buffer for discharges through that area. You would not be required to provide additional treatment of stormwater discharges that flow through 50 feet or more of natural buffer. See Figure G-4.

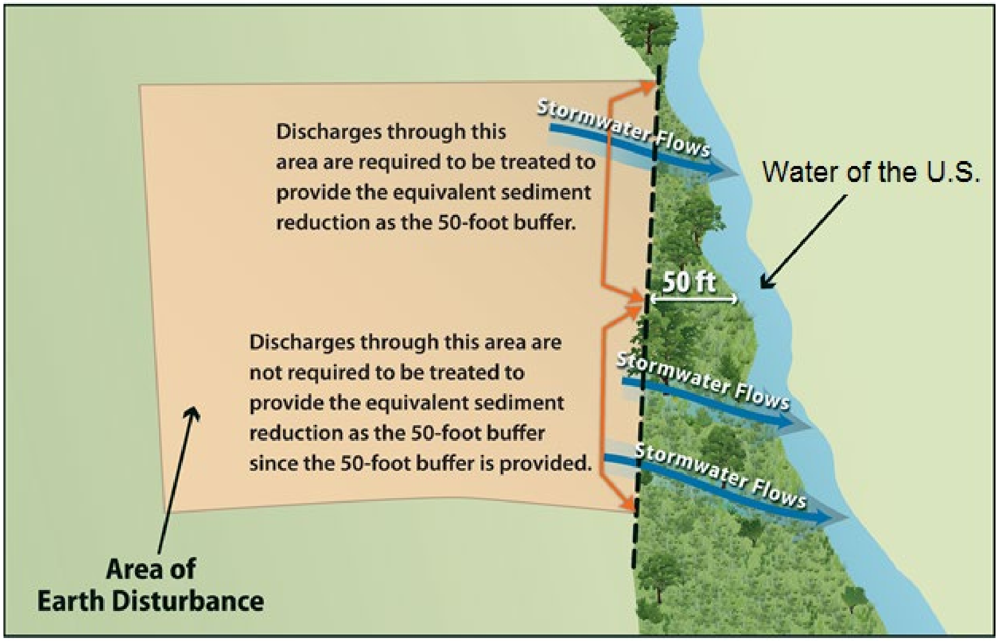

Figure G-4 Example of how to comply with the requirement to provide the equivalent sediment reduction when only a portion of your earth-disturbances discharge to a buffer of less than 50-feet.

Steps to help you meet compliance alternative 2 and 3 requirements are provided below.

<u>Step 1 - Estimate the Sediment Reduction from the 50-foot Buffer</u>

In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. EPA has simplified this calculation by developing buffer performance tables covering a range of vegetation and soil types for the areas covered by the CGP. See Attachment 1 of this Appendix, Tables G-8 through G-15. Note: buffer performance values in Tables G-8 through G-15 represent the percent of sediment captured through the use of perimeter controls (e.g., silt fences) and 50-foot buffers at disturbed sites of fixed proportions and slopes.[1]

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[1] EPA used the following when developing the buffer performance tables:

- The sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 ("Revised Universal Soil Loss Equation 2") model for slope profiles using a 100-foot long denuded slopes.
- Sediment removal was defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from denuded area (tons/yr/acre).
- As perimeter controls are also required by the CGP, sediment removal is in part a function of the reduction due to a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upstream edge of the natural buffer and flow traveling through a 50-foot buffer of undisturbed natural vegetation.
- It was assumed that construction sites have a relatively uniform slope without topographic features that accelerate the concentration for erosive flows.

Using Tables G-8 through G-15 (see Attachment 1 of this Appendix), you can determine the sediment removal efficiency of a 50-foot buffer for your geographic area by matching the vegetative cover type that best describes your buffer area and the type of soils that predominate at your site. For example, if your site is located in Massachusetts (Table G-9), and your buffer vegetation corresponds most closely with that of tall fescue grass, and the soil type at your site is best typified as sand, your site's sediment removal efficiency would be 81 percent.

In this step, you should choose the vegetation type in the tables that most closely matches the vegetation that would exist naturally in the buffer area on your site regardless of the condition of the buffer. However, because you are not required to plant any additional vegetation in the buffer area, in determining what controls are necessary to meet this sediment removal equivalency in Step 2 below, you will be able to take credit for this area as a fully vegetated "natural buffer."

Similarly, if a portion of the buffer area adjacent to the water of the U.S. is owned by another party and is not under your control, you can treat the area of land not under your control as having the equivalent vegetative cover and soil type that predominates on the portion of the property on which your construction activities are occurring.

> *For example, if your earth-disturbances occur within 50 feet of a water of the U.S., but the 10 feet of land immediately adjacent to the water of the U.S. is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10 foot area adjacent to the stream as having the equivalent soil and vegetation type that predominates in the 40 foot area under your control. You would then make the same assumption in Step 2 for purposes of determining the equivalent sediment removal.*

Alternatively, you may do your own calculation of the effectiveness of the 50-foot buffer based upon your site-specific conditions, and may use this number as your sediment removal equivalency standard to meet instead of using Tables G-8 through G-15. This calculation must be documented in your SWPPP.

Step 2 - Design Controls That Match the Sediment Removal Efficiency of the 50-foot Buffer

Once you determine the estimated sediment removal efficiency of a 50-foot buffer for your site in Step 1, you must next select stormwater controls that will provide an equivalent sediment load reduction. These controls can include the installation of a single control, such as a sediment pond or additional perimeter controls, or a combination of stormwater controls. Whichever control(s) you select, you must demonstrate in your SWPPP that the controls will provide at a minimum the same sediment removal capabilities as a 50-foot natural buffer (Step 1). You may take credit for the removal efficiencies of your required perimeter controls in your calculation of equivalency, because these were included in calculating the buffer removal efficiencies in Tables G-8 through G-15. (Note: You are reminded that the controls must be kept in effective operating condition until you complete final stabilization on the disturbed portions of the site discharging to the water of the U.S.)

- It was assumed that vegetation has been removed from the disturbed portion of the site and a combination of cuts and fills have resulted in a smooth soil surface with limited retention of near-surface root mass.

To represent the influence of soil, EPA analyzed 11 general soil texture classifications in its evaluation of buffer performance. To represent different types of buffer vegetation, EPA evaluated 4 or more common vegetative types for each state/territory covered under the permit. For each vegetation type evaluated, EPA considered only permanent, non-grazed, and non-harvested vegetation, on the assumption that a natural buffer adjacent to the water of the U.S. will typically be undisturbed. EPA also evaluated slope steepness and found that sediment removal efficiencies present in Tables G-8 through G-15 are achievable for slopes that are less than nine percent.

To make the determination that your controls and/or buffer area achieve an equivalent sediment load reduction as a 50-foot buffer, you should use a model or other type of calculation. As mentioned above, there are a variety of models available that can be used to support your calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other models. A couple of examples are provided in Attachment 3 to help illustrate how this determination could be made.

If you retain a buffer of less than 50 feet, you may take credit for the removal that will occur from the reduced buffer and only need to provide additional controls to make up the difference between the removal efficiency of a 50 foot buffer and the removal efficiency of the narrower buffer. For example, if you retain a 30 foot buffer, you can account for the sediment removal provided by the 30 foot buffer retained, and you will only need to design controls to make up for the additional removal provided by the 20 feet of buffer that is not being provided. To do this, you would plug the width of the buffer that is retained into RUSLE or another model, along with other stormwater controls that will together achieve a sediment reduction equivalent to a natural 50-foot buffer.

As described in Step 1 above, you can take credit for the area you retained as a "natural buffer" as being fully vegetated, regardless of the condition of the buffer area.

> *For example, if your earth-disturbances occur 30 feet from a water of the U.S., but the 10 feet of land immediately adjacent to the water of the U.S. is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10-foot area as a natural buffer, regardless of the activities that are taking place in the area. Therefore, you can assume (for purposes of your equivalency calculation) that your site is providing the sediment removal equivalent of a 30-foot buffer, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided.*

Step 3 - Document How Site-Specific Controls Will Achieve the Sediment Removal Efficiency of the 50-foot Buffer

In Steps 1 and 2, you determined both the expected sediment removal efficiency of a 50-foot buffer at your site, and you used this number as a performance standard to design controls to be installed at your site, which alone or in combination with any retained natural buffer, achieves the expected sediment removal efficiency of a 50-foot buffer at your site. The final step is to document in your SWPPP the information you relied on to calculate the equivalent sediment reduction as an undisturbed natural buffer.

EPA will consider your documentation to be sufficient if it generally meets the following:

- For Step 1, refer to the table in Attachment 1 that you used to derive your estimated 50-foot buffer sediment removal efficiency performance. Include information about the buffer vegetation and soil type that predominate at your site, which you used to select the sediment load reduction value in Tables G-8 through G-15. Or, if you conducted a site-specific calculation for sediment removal efficiency, provide the specific removal efficiency, and the information you relied on to make your site-specific calculation.
- For Step 2, (1) Specify the model you used to estimate sediment load reductions from your site; and (2) the results of calculations showing how your controls will meet or exceed the sediment removal efficiency from Step 1.

If you choose compliance alternative 3, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

G.3 SMALL RESIDENTIAL LOT COMPLIANCE ALTERNATIVES

A **small residential lot** is a lot or grouping of lots being developed for residential purposes that will disturb less than 1 acre of land, but that is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

EPA has developed two additional compliance alternatives applicable only to "small residential lots" that are unable to provide and maintain a 50 foot buffer.

The following steps describe how a small residential lot operator would achieve compliance with one these 2 alternatives.

G.3.1 Small Residential Lot Compliance Alternative Eligibility

In order to be eligible for the small residential lot compliance alternatives, the following conditions must be met:

a. The lot or grouping of lots meets the definition of "small residential lot"; and

b. The operator must follow the guidance for providing and maintaining a natural buffer in Part G.2.3 of this Appendix, including:

  i. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;

  ii. Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and

  iii. Delineate, and clearly mark off, with flags, tape, or other similar marking device, all natural buffer areas.

G.3.2 Small Residential Lot Compliance Alternatives

You must next choose from one of two small residential lot compliance alternatives and implement the stormwater control practices associated with that alternative.

> *Note: The compliance alternatives provided below are not mandatory. Operators of small residential lots can alternatively choose to comply with the any of the options that are available to other sites in Part 2.2.1.a and G.2.1 of this Appendix.*

Small Residential Lot Compliance Alternative 1

Alternative 1 is a straightforward tiered-technology approach that specifies the controls that a small residential lot must implement based on the buffer width retained. To meet the requirements of small residential lot compliance alternative 1, you must implement the controls specified in Table G-1 based on the buffer width to be retained. See footnote 3, below, for a description of the controls you must implement.

> *For example, if you are an operator of a small residential lot that will be retaining a 35-foot buffer and you choose Small Residential Lot Compliance Alternative 1, you must implement double perimeter controls between earth disturbances and the water of the U.S.*

In addition to implementing the applicable control, you must also document in your SWPPP how you will comply with small residential lot compliance alternative 1.

Table G-1 Alternative 1 Requirements[2]

Retain 50-foot Buffer	Retain <50 and >30 foot Buffer	Retain ≤ 30 foot Buffer
No Additional Requirements	Double Perimeter Controls	Double Perimeter Controls and 7-Day Site Stabilization

Small Residential Lot Compliance Alternative 2

Alternative 2 specifies the controls that a builder of a small residential lot must implement based on both the buffer width retained and the site's sediment discharge risk. By incorporating the sediment risk, this approach may result in the implementation of controls that are more appropriate for the site's specific conditions.

Step 1 – Determine Your Site's Sediment Risk Level

To meet the requirements of Alternative 2, you must first determine your site's sediment discharge "risk level" based on the site's slope, location, and soil type. To help you to determine your site's sediment risk level, EPA developed five different tables for different slope conditions. You should select the table that most closely corresponds to your site's average slope.

> *For example, if your site's average slope is 7 percent, you should use Table G-4 to determine your site's sediment risk.*

After you determine which table applies to your site, you must then use the table to determine the "risk level" (e.g., "low", "moderate", or "high") that corresponds to your site's location and predominant soil type.[3]

> *For example, based on Table G-3, a site located in New Hampshire with a 4 percent average slope and with predominately sandy clay loam soils would fall into the "moderate" risk level.*

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[2] **Description of Additional Controls Applicable to Small Residential Lot Compliance Alternatives 1 and 2:**

- **No Additional Requirements:** If you implement a buffer of 50 feet or greater, then you are not subject to any additional requirements. Note that you are required to install perimeter controls between the disturbed portions of your site and the buffer in accordance with Part 2.2.3.
- **Double Perimeter Control:** In addition to the reduced buffer width retained on your site, you must provide a double row of perimeter controls between the disturbed portion of your site and the water of the U.S. spaced a minimum of 5 feet apart.
- **Double Perimeter Control and 7-Day Site Stabilization:** In addition to the reduced buffer width retained on your site and the perimeter control implemented in accordance with Part 2.2.3, you must provide a double row of perimeter controls between the disturbed portion of your site and the water of the U.S. spaced a minimum of 5 feet apart, and you are required to complete the stabilization activities specified in Parts 2.2.14 within 7 calendar days of the temporary or permanent cessation of earth-disturbing activities.

[3] One source for determining your site's predominant soil type is the USDA's Web Soil Survey located at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Table G-2 Risk Levels for Sites with Average Slopes of ≤ 3 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Low	Moderate	Low	Moderate	Moderate
American Samoa	Moderate	Moderate	Moderate	Moderate	High
Massachusetts and New Hampshire	Low	Moderate	Low	Low	Moderate
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Low
Washington D.C.	Low	Moderate	Low	Low	Moderate

Table G-3 Risk Levels for Sites with Average Slopes of > 3 Percent and ≤ 6 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	Moderate	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Low	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G-4 Risk Levels for Sites with Average Slopes of > 6 Percent and ≤ 9 Percent

Soil Type Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	High	Moderate	High	High
Puerto Rico	Moderate	High	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G-5 Risk Levels for Sites with Average Slopes of > 9 Percent and ≤ 15 Percent

Soil Type Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	Moderate	High	Moderate	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Moderate	Low	Moderate	Moderate
Washington D.C.	Moderate	High	Moderate	Moderate	High

Table G-6 Risk Levels for Sites with Average Slopes of > 15 Percent

Soil Type Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	High	High	High	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	High	High	Moderate	High	High
Idaho	Low	Low	Low	Low	Moderate
New Mexico	Moderate	Moderate	Moderate	Moderate	High
Washington D.C.	High	High	Moderate	High	High

Step 2 – Determine Which Additional Controls Apply

Once you determine your site's "risk level", you must next determine the additional controls you need to implement on your site, based on the width of buffer you plan to retain. Table G-7 specifies the requirements that apply based on the "risk level" and buffer width retained. See footnote 3, above, for a description of the additional controls that are required.

> *For example, if you are the operator of a small residential lot that falls into the "moderate" risk level, and you decide to retain a 20-foot buffer, using Table G-7 you would determine that you need to implement double perimeter controls to achieve compliance with small residential lot compliance alternative 2.*

You must also document in your SWPPP your compliance with small residential lot compliance alternative 2.

Table G-7. Alternative 2 Requirements[2]

Risk Level Based on Estimated Soil Erosion	Retain ≥ 50' Buffer	Retain <50' and >30' Buffer	Retain ≤30' and >10' Buffer	Retain ≤ 10' Buffer
Low Risk	No Additional Requirements	No Additional Requirements	Double Perimeter Control	Double Perimeter Control
Moderate Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization
High Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization	Double Perimeter Control and 7-Day Site Stabilization

ATTACHMENT 1

Sediment Removal Efficiency Tables[4]

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table G-8 Estimated 50-foot Buffer Performance in Idaho*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G-9 Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

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[4] The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.2.3).

Table G-10 Estimated 50-foot Buffer Performance in New Mexico*

	Estimated % Sediment Removal				
**Type of Buffer Vegetation ** **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue grass	71	85	80	86	90
Medium-density Weeds	56	73	55	66	78
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	53	70	51	62	67
Southern Mixed Prairie Grass	53	71	52	63	50
Southern Range Cold Desert Shrubs	56	73	55	65	53

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G-11 Estimated 50-foot Buffer Performance in Washington, DC*

	Estimated % Sediment Removal				
**Type of Buffer Vegetation ** **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	81	90	90	90	90
Tall Fescue Grass	79	90	83	89	90
Medium-density Weeds	71	79	66	75	74

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G-12 Estimated 50-foot Buffer Performance in American Samoa*

	Estimated % Sediment Removal				
**Type of Buffer Vegetation ** **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	82	90	90	90	83
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	85
Dense Grass	82	90	90	90	83
Tall Fescue Grass	82	89	82	89	79
Medium-density Weeds	70	73	62	75	59

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G-13 Estimated 50-foot Buffer Performance in CNMI and Guam*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	80	90	90	90	89
Warm-season Grass (i.e., Switchgrass, Lemongrass)	80	90	90	90	90
Dense Grass	79	90	90	90	89
Tall Fescue Grass	76	90	80	88	87
Medium-density Weeds	63	73	53	68	61

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G-14 Estimated 50-foot Buffer Performance in Puerto Rico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	83	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	83	90	90	90	90
Dense Grass	83	90	90	90	90
Tall Fescue Grass	82	90	84	90	89
Medium-density Weeds	72	78	65	76	64

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G-15 Estimated 50-foot Buffer Performance in Virgin Islands*

Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	85	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	86	90	90	90	90
Dense Grass	85	90	90	90	90
Tall Fescue Grass	85	90	88	90	89
Medium-density Weeds	75	77	71	78	63

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

ATTACHMENT 2

Using the Sediment Removal Efficiency Tables – Questions and Answers

- *What if my specific buffer vegetation is not represented in Tables G-8 through G-15?* Tables G - 8 through G - 15 provide a wide range of factors affecting buffer performance; however, there are likely instances where the specific buffer vegetation type on your site is not listed. If you do not see a description of the type of vegetation present at your site, you should choose the vegetation type that most closely matches the vegetation type on your site. You can contact your local Cooperative Extension Service Office (http://nifa.usda.gov/partners-and-extension-map) for assistance in determining the vegetation type in Tables G-8 through G-15 that most closely matches your site-specific vegetation.
- *What if there is high variability in local soils?* EPA recognizes that there may be a number of different soil type(s) on any given construction site. General soil information can be obtained from USDA soil survey reports (http://websoilsurvey.nrcs.usda.gov) or from individual site assessments performed by a certified soil expert. Tables G-8 through G-15 present eleven generic soil texture classes, grouping individual textures where EPA has determined that performance is similar. If your site contains different soil texture classes, you should use the soil type that best approximates the predominant soil type at your site.
- *What if my site slope is greater than 9 percent after final grade is reached?* As indicated in the buffer performance tables, the estimated sediment removal efficiencies are associated with disturbed slopes of up to 9 percent grade. Where your graded site has an average slope of greater than 9 percent, you should calculate a site-specific buffer performance.
- *How do I calculate my own estimates for sediment reduction at my specific site?* If you determine that it is necessary to calculate your own sediment removal efficiency using site-specific conditions (e.g., slopes at your site are greater than 9 percent), you can use 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 models.
- *What is my estimated buffer performance if my site location is not represented by Tables G-8 through G-15?* If your site is located in an area not represented by Tables G-8 through G-15, you should use the table that most closely approximates conditions at your site. You may instead choose to conduct a site-specific calculation of the buffer performance.
- *What if only a portion of my site drains to the buffer area?* If only a portion of your site drains to a water of the U.S., where that water is within 50 feet of your earth disturbances, you are only required to meet the equivalency requirement for the stormwater flows corresponding to those portions of the site. See Example 2 below for an example of how this is expected to work.

ATTACHMENT 3

Examples of How to Use the Sediment Removal Efficiency Tables

Example 1. Comparatively Wet Location (7.5 acre site located in Massachusetts)

The operator of a 7.5-acre construction site in Massachusetts has determined that it is infeasible to establish a buffer of any size on the site, and is now required to select and install controls that will achieve an equivalent sediment load reduction as that estimated in G-9 for their site conditions. The first step is to identify what percentage of eroded sediment is estimated to be retained from a 50-foot buffer. For this example, it is assumed that the site has a relatively uniform gentle slope (3 percent), so Table G-9 can be used to estimate the 50-foot buffer sediment load reduction. If the site's buffer vegetation is best typified by cool-season dense grass and the underlying soil is of a type best described as loamy sand, the 50-foot buffer is projected to capture 90 percent of eroded sediment from the construction site.

The second step is to determine what sediment controls can be selected and installed in combination with the perimeter controls already required to be implemented at the site (see Part 2.2.3), which will achieve the 90 percent sediment removal efficiency from Table G-9. For this example, using the RUSLE2 profile model, it was determined that installing a pair of shallow-sloped diversion ditches to convey runoff to a well-designed and maintained sediment basin provides 99 percent sediment removal. Because the estimated sediment reduction is greater than the required 90 percent that a 50-foot buffer provides, the operator will have met the buffer requirements. See Figure G-5. The operator could also choose a different set of controls, as long as they achieve at least a 90 percent sediment removal efficiency.

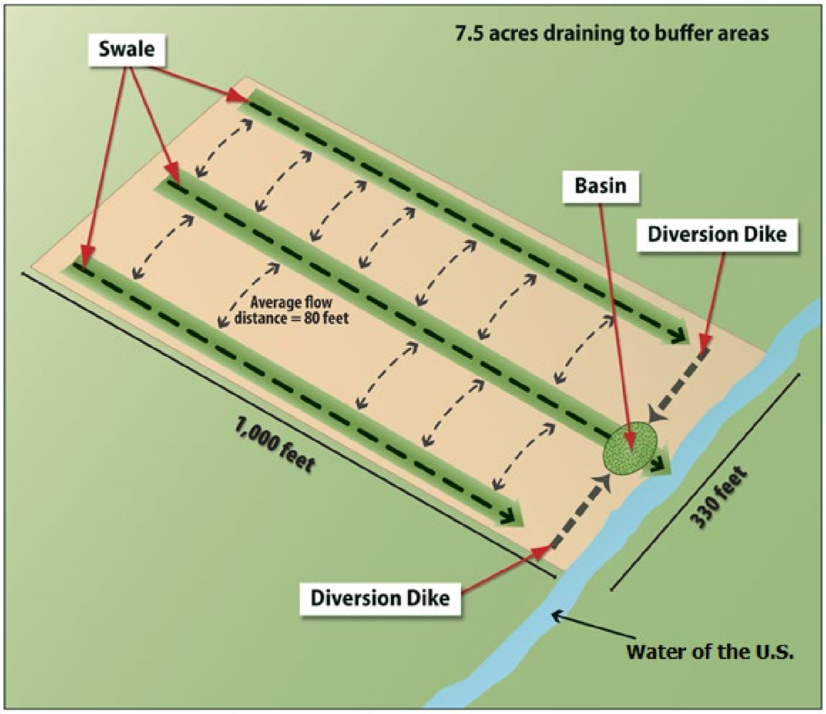


Figure G-5 Example 1 – Equivalent Sediment Load Reductions at a 7.5 ac Site in MA.

Example 2. Arid Location With Pre-existing Disturbances in the Natural Buffer (6.5 acre site located in New Mexico)

An operator of a site in New Mexico determines that it is not feasible to provide a 50-foot buffer, but a 28-foot buffer can be provided. Because the operator will provide a buffer that is less than

50 feet, the operator must determine which controls, in combination with the 28-foot buffer, achieve a sediment load reduction equivalent to the 50-foot buffer. In this example, the project will disturb 6.5 acres of land, but only 1.5 acres of the total disturbed area drains to the buffer area. Within the 28-foot buffer area is a preexisting concrete walkway. Similar to Example 1, the equivalence analysis starts with Step 1in Part G.2.4 of this Appendix with a review of the New Mexico buffer performance (Table G-10). The operator determines that the predominate vegetation type in the buffer area is prairie grass, the soil type is similar to silt, and the site is of a uniform, shallow slope (e.g., 3 percent grade). Although the operator will take credit for the disturbance caused by the concrete walkway as a natural buffer in Step 2, here the operator can treat the entire buffer area as being naturally vegetated with prairie grass. Based on this information, the operator refers to Table G-10 to estimate that the 50-foot buffer would retain 50 percent of eroded soil.

The second step is to determine, based on the 50 percent sediment removal efficiency found in Table G-10, what sediment controls, in combination with the 28-foot buffer area, can be implemented to reduce sediment loads by 50 percent or more. The operator does not have to account the reduction in buffer function caused by the preexisting walkway, and can take credit for the entire 28-foot buffer being fully vegetated in the analysis. For this example, using the RUSLE2 profile model, the operator determined that installing a fiber roll barrier between the silt fence (already required by Part 2.2.3) and the 28-foot buffer will achieve an estimated 84 percent sediment removal efficiency. See Figure G-6. Note that this operator is subject to the requirement in Part G.2.3 of this Appendix to ensure that discharges through the silt fence, fiber roll barrier, and 28-foot buffer do not cause erosion within the buffer. The estimated sediment reduction is greater than the required 50 percent; therefore the operator will have met the buffer alternative requirement.

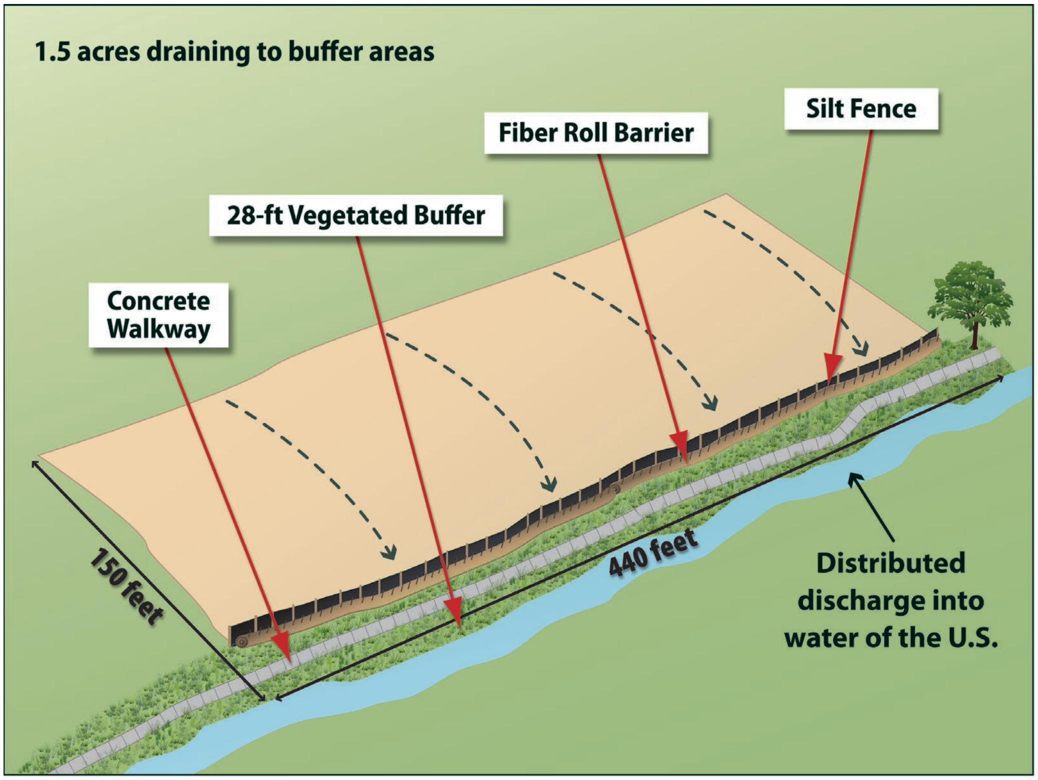


Figure G-6 Example 2 – Equivalent Sediment Load Reductions at a 6.5 ac Site in NM.

Appendix H – 2-Year, 24-Hour Storm Frequencies

Part 2.2.12 of the permit indicates that if you install a sediment basin, one of the design requirements is to provide storage for either (1) the calculated volume of runoff from a 2-year, 24-hour storm, or (2) 3,600 cubic feet per acre drained. This appendix is intended to provide a guide to permittees to determine the volume of precipitation associated with their local 2-year, 24-hour storm event.

The permittee should start out by determining their local 2-year, 24-hour storm volume. The rainfall frequency atlases, technical papers, and the Precipitation Frequency Data Server (PFDS) developed by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) serve as national standards for rainfall intensity at specified frequencies and durations in the United States. Table H-1 identifies methods for determining precipitation frequency based on permit area. EPA notes that permittees may also use alternative peer-reviewed data sources not listed in Table H - 1 to determine the 2-year, 24-hour storm for their site.

Table H -1 – Method to Determine Precipitation Frequency Based on Permit Area

PERMIT AREA	METHOD TO DETERMINE PRECIPITATION FREQUENCY
District of Columbia	PFDS; NOAA Atlas 14, Vol. 2
Idaho	NOAA Atlas 2, Vol. 5; Technical Paper 40
Massachusetts	Technical Paper 40
New Hampshire	Technical Paper 40
New Mexico	PFDS; Technical Paper 40
Selected Pacific Islands	PFDS; Technical Paper 40
Puerto Rico and the U.S Virgin Islands	PFDS; Technical Paper 40
Other	PFDS; Technical Paper 40; NOAA Atlas 2 or 14

How to Determine Your Local 2-year, 24-hour Storm Size

Projects located in the **District of Columbia, Massachusetts, New Hampshire, New Mexico, Puerto Rico, U.S. Virgin Islands, or Pacific Island**s can use the PFDS at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html or the appropriate NOAA's Atlas 14 Volume at http://www.nws.noaa.gov/oh/hdsc/currentpf.htm to determine their precipitation frequency.

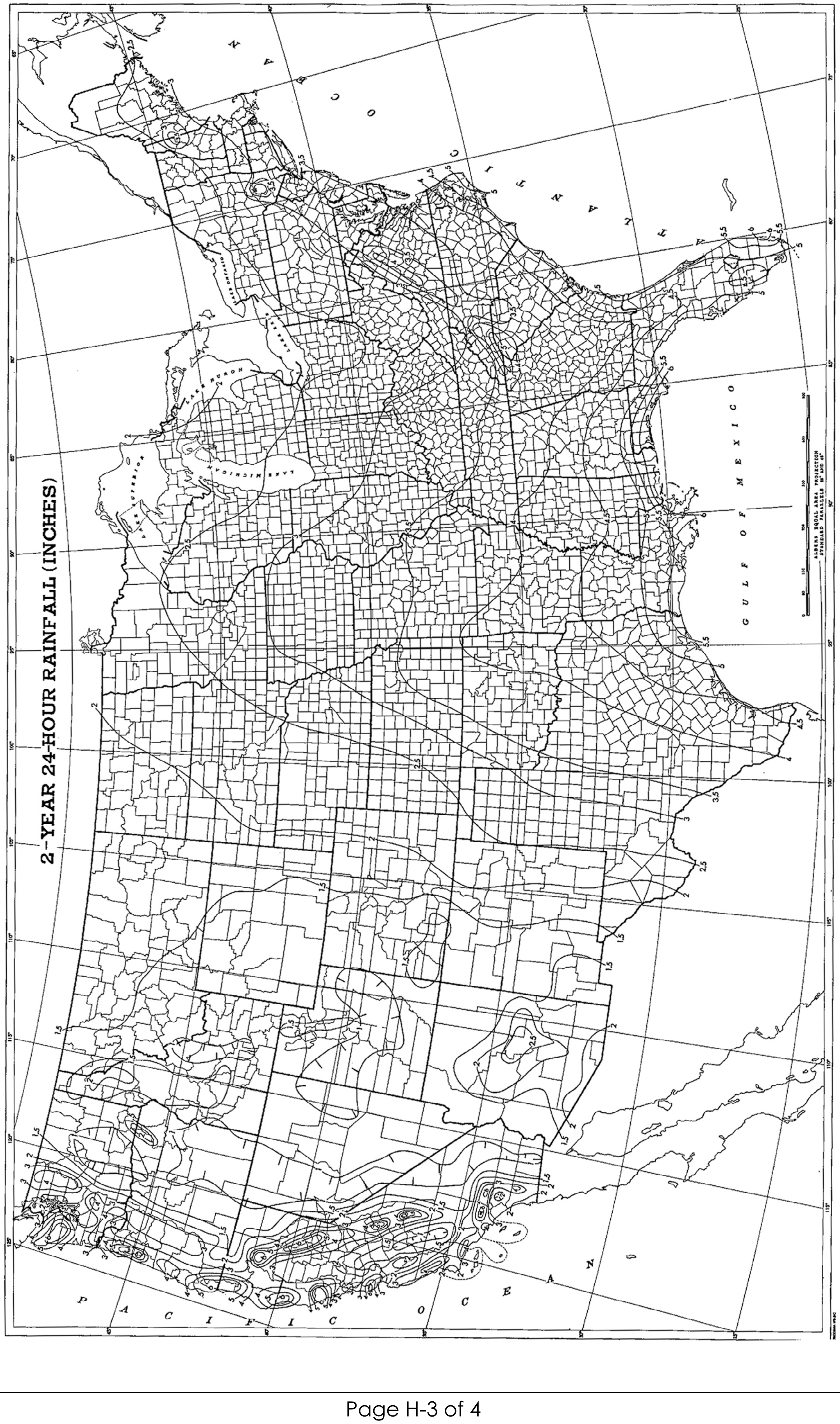
The PFDS is an easy to use, point-and-click interface to official U.S. precipitation frequency estimates and intensities. The opening PFDS screen is a clickable map of the United States. Upon clicking on a state, a state-specific interface appears. From this page the user selects the following:

- A location: Either via clicking on the map or manually entering a longitude/latitude coordinate;
- Data type: precipitation depth or precipitation intensity
- Units: english or metric; and
- Time series type: partial duration or annual maximum.

Additionally, PFDS also serves as a tool for providing references and other information for other current precipitation frequency standards that are not yet updated.

Projects located in **Idaho** can use the NOAA Atlas 2, Vol. 5 to determine their precipitation frequency. NOTE: Precipitation Frequencies on the NOAA Atlas 2, Vol. 5 are in tenths of an inch and will have to be converted to inches to determine precipitation frequency. NOAA Atlas 2, Vol. 5 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas2_Volume5.pdf. (See also attached map of NOAA Atlas 2, Vol. 5)

Projects located in areas not covered by the PFDS or NOAA Atlases will need to use TP-40 to identify the precipitation frequency. TP-40 provides a map of the continental U.S. for the 2-year, 24-hour rainfall. TP40 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/TechnicalPaper_No40.pdf. (See also attached map of TP-40)



2-YEAR 24-HOUR RAINFALL (INCHES)

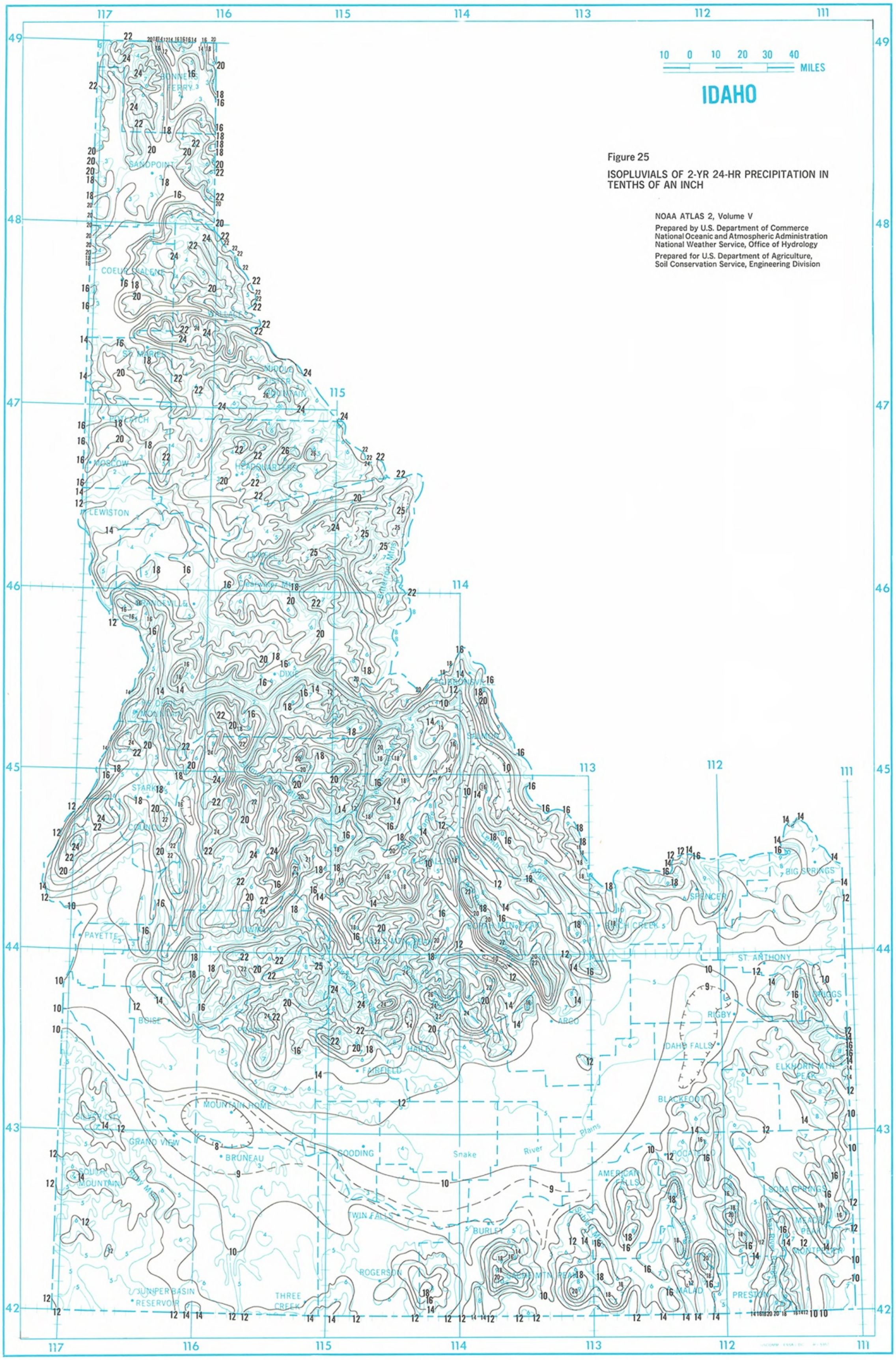


Figure 25

ISOPLUVIALS OF 2-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

NOAA ATLAS 2, Volume V

Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology

Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division

Appendix I - Standard Permit Conditions

Standard permit conditions in Appendix I are consistent with the general permit provisions required under 40 CFR 122.41.

I.1 Duty To Comply.

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

I.1.1 You must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards, even if the permit has not yet been modified to incorporate the requirement.

I.1.2 Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (61 FR 252, December 31, 1996, pp. 69359-69366, as corrected in 62 FR 54, March 20, 1997, pp.13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every 4 years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties following were adjusted for inflation starting in 1996.

I.1.2.1 *Criminal Penalties.*

a. *Negligent Violations*. The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than two years, or both.

b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision be subject to a fine of not more than $1,000,000 and can fined up to $2,000,000 for second or subsequent convictions.

d. *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.1.2.2 *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amount authorized by Section 309(d) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

I.1.2.3 *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows

a. *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note), as amended (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

b. *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note), as amended, (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

I.2 Duty to Reapply.

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain authorization as required by the new permit once EPA issues it.

I.3 Need to Halt or Reduce Activity Not a Defense.

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

I.4 Duty to Mitigate.

You must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

I.5 Proper Operation and Maintenance.

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

I.6 Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

I.7 Property Rights.

This permit does not convey any property rights of any sort, or any exclusive privileges.

I.8 Duty to Provide Information.

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information that EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA or an authorized representative upon request, copies of records required to be kept by this permit.

I.9 Inspection and Entry.

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

I.9.1 Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

I.9.2 Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

I.9.3 Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

I.9.4 Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

I.10 Monitoring and Records.

I.10.1 Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

I.10.2 You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the permittee's authorization is terminated. This period may be extended by request of EPA at any time.

I.10.3 Records of monitoring information must include:

I.10.3.1 The date, exact place, and time of sampling or measurements;

I.10.3.2 The individual(s) who performed the sampling or measurements;

I.10.3.3 The date(s) analyses were performed

I.10.3.4 The individual(s) who performed the analyses;

I.10.3.5 The analytical techniques or methods used; and

I.10.3.6 The results of such analyses.

I.10.4 Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

I.10.5 The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

I.11 Signatory Requirements.

I.11.1 All applications, including NOIs, must be signed as follows:

I.11.1.1 For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

I.11.1.2 For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

I.11.1.3 For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

I.11.2 Your SWPPP, including changes to your SWPPP, inspection reports, and any other compliance documentation required under this permit, must be signed by a person described in Appendix I, Subsection I.11.1 above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

I.11.2.1 The authorization is made in writing by a person described in Appendix I, Subsection I.11.1;

I.11.2.2 The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

I.11.2.3 The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

I.11.3 Changes to Authorization. If an authorization under this permit is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI must be submitted to EPA. See Table 1 in Part 1.4.2 of the permit. However, if the only change that is occurring is a change in contact information or a change in the facility's address, the operator need only make a modification to the existing NOI submitted for authorization.

I.11.4 Any person signing documents in accordance with Appendix I, Subsections I.11.1 or I.11.2 above must include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

I.11.5 For persons signing NOIs electronically, in addition to meeting other applicable requirements in Appendix I, Subsection I.11, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication).

I.11.6 The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.12 Reporting Requirements.

I.12.1 Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

I.12.1.1 The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

I.12.1.2 The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

I.12.2 Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

I.12.3 Transfers. This permit is not transferable to any person except after notice to EPA. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination pursuant to Part 8. The new owner or operator must submit a Notice of Intent in accordance with Part 1.7 and Table 1. See also requirements in Appendix I, Subsections I.11.1 and I.11.2.

I.12.4 Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

I.12.4.1 Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.

I.12.4.2 If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.

I.12.5 Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

I.12.6 Twenty-four hour reporting. In addition to reports required elsewhere in this permit:

I.12.6.1 You must report any noncompliance which may endanger health or the environment directly to the EPA Regional Office (see contacts at https://www2.epa.gov/national-pollutant-discharge-elimination-system-npdes/contact-us-stormwater#regional). Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

I.12.6.2 The following shall be included as information which must be reported within 24 hours under this paragraph.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR 122.41(m)(3)(ii))

b. Any upset which exceeds any effluent limitation in the permit

c. Violation of a maximum daily discharge limit for any numeric effluent limitation. (See 40 CFR 122.44(g).)

I.12.6.3 EPA may waive the written report on a case-by-case basis for reports under Appendix I, Subsection I.12.6.2 if the oral report has been received within 24 hours.

I.12.7 Other noncompliance. You must report all instances of noncompliance not reported under Appendix I, Subsections I.12.4, I.12.5, and I.12.6, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix I, Subsection I.12.6.

I.12.8 Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

I.13 Bypass.

I.13.1 Definitions.

I.13.1.1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility See 40 CFR 122.41(m)(1)(i).

I.13.1.2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).

I.13.2 Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix I, Subsections I.13.3 and I.13.4. See 40 CFR 122.41(m)(2).

I.13.3 Notice.

I.13.3.1 Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass. See 40 CFR 122.41(m)(3)(i).

I.13.3.2 Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix I, Subsection I.12.6 (24-hour notice). See 40 CFR 122.41(m)(3)(ii).

I.13.4 Prohibition of bypass. See 40 CFR 122.41(m)(4).

I.13.4.1 Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix I, Subsection I.13.3.

I.13.4.2 EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix I, Subsection I.13.4.1.

I.14 Upset.

I.14.1 Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

I.14.2 Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix I, Subsection I.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. See 40 CFR 122.41(n)(2).

I.14.3 Conditions necessary for a demonstration of upset. See 40 CFR 122.41(n)(3). A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

I.14.3.1 An upset occurred and that you can identify the cause(s) of the upset;

I.14.3.2 The permitted facility was at the time being properly operated; and

I.14.3.3 You submitted notice of the upset as required in Appendix I, Subsection I.12.6.2.b (24 hour notice).

I.14.3.4 You complied with any remedial measures required under Appendix I, Subsection I.4.

I.14.4 Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, have the burden of proof. See 40 CFR 122.41(n)(4).

I.15 Retention of Records.

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

I.16 Reopener Clause.

I.16.1 Procedures for modification or revocation. Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

I.16.2 Water quality protection. If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit, or the permit may be modified to include different limitations and/or requirements.

I.16.3 Timing of permit modification. EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

I.17 Severability.

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA's intent is that the permit is to remain in effect to the extent possible; in the event that any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

Appendix J - Notice of Intent (NOI) Form and Instructions

Part 1.4.1 requires you to use the NPDES eReporting Tool, or "NeT" system, to prepare and submit your NOI electronically. However, if the EPA Regional Office grants you a waiver to use a paper NOI form, and you elect to use it, you must complete and submit the following form.

NPDES **FORM** **3510-9**	**EPA**	**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY** **WASHINGTON, DC 20460** **NOTICE OF INTENT FOR THE 2017 NPDES CONSTRUCTION GENERAL PERMIT**	**Form Approved.** **OMB No. 2040-0004**

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOI Form

Have you been granted a waiver from electronic reporting from the Regional Office *? ☐ YES ☐ NO

If yes, check which waiver you have been granted, , the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver:

Date approval obtained: / /

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

II. Permit Information

NPDES ID (EPA Use Only):

Master Permit Number: (see Appendix B of the CGP for the list of eligible permit numbers)

III. Operator Information

Operator Information

Operator Name:

Are you requesting coverage under this NOI as a "federal operator" as defined in Appendix A? ☐ YES ☐ NO

Mailing Address:

Street:

City: State: ZIP Code: -

County or Similar Government Division:

Phone: - - Ext.

E-mail:

Operator Point of Contact Information:

First Name, Middle Initial, Last Name:

Title:

NOI Preparer (Complete if NOI was prepared by someone other than the certifier):

First Name, Middle Initial, Last Name:

Organization:

Phone: - - Ext.

E-mail:

IV. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location:

City: State: ZIP Code: -

County or Similar Government Subdivision:

For the project/site you are seeking permit coverage, provide the following information:

Latitude/Longitude (Use decimal degrees and specify method):

Latitude: ___ ___. ___ ___ ___ ___° N (decimal degrees) Longitude: ___ ___ ___. ___ ___ ___ ___° W (decimal degrees)

Latitude/Longitude Data Source: ☐ Map ☐ GPS ☐ Other____________________ Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☐ WGS 84

Is your project/site located in Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ YES ☐ NO

If yes, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property:

Estimated Project Start Date: / / Estimated Project Completion Date: / /

Estimated Area to be Disturbed (to the nearest quarter acre): .

Type of Construction Site (check all that apply): ☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial ☐ Industrial ☐ Institutional ☐ Highway or Road ☐ Utility ☐ Other

Will there be demolition of any structure built or renovated before January 1, 1980? ☐ YES ☐ NO

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space? ☐ YES ☐ NO

Was the pre-development land use used for agriculture (see Appendix A for definition of "agricultural land")? ☐ YES ☐ NO

Have earth-disturbing activities commenced on your project/site? ☐ YES ☐ NO

If yes, is your project an "emergency-related project" (see Appendix A)? ☐ YES ☐ NO

Have stormwater discharges from your project/site been covered previously under an NPDES permit? ☐ YES ☐ NO

If yes, provide the NPDES ID (if you had coverage under EPA's 2012 CGP or the NPDES permit number if you had coverage under an EPA individual permit:

V. Discharge Information

By indicating "Yes" below, I confirm that I understand that the CGP only authorizes the allowable stormwater discharges in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), during an inspection, etc. If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must be covered under another NPDES permit.

☐ YES

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ YES ☐ NO

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☐ YES ☐ NO

Receiving Waters Information: (Attach a separate list if necessary)

Point of Discharge ID	**For each point of discharge, provide the following receiving water information:**		
	Provide the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to:	**If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:**	**If a TMDL been completed for this receiving waterbody, providing the following information:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**

			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**

Are any of the waters of the U.S. to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? (See Appendix F).

☐ YES ☐ NO

If yes, name(s) of receiving water(s) and its designation (Tier 2, Tier 2.5 or Tier 3):

VI. Chemical Treatment Information

Will you use polymers, flocculants, or other treatment chemicals at your construction site? ☐ YES ☐ NO

If yes, will you use cationic treatment chemicals at your construction site*? ☐ YES ☐ NO

If yes, have you been authorized to use cationic treatment chemicals by your applicable EPA Regional Office in advance of filing your NOI*?
☐ YES ☐ NO

If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

Please indicate the treatment chemicals that you will use:

* Note: You are ineligible for coverage under this permit unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

VII. Stormwater Pollution Prevention Plan (SWPPP) Information

Has the SWPPP been prepared in advance of filing this NOI, as required? ☐ YES ☐ NO

SWPPP Contact Information:

First Name, Middle Initial Last Name:

Professional Title:

Phone: - - Ext.

E-mail:

VIII. Endangered Species Protection

Using the instructions in Appendix D of the CGP, under which criterion listed below are you eligible for coverage under this permit? Check only 1 box, include the required information and provide a sound basis for supporting the criterion selected**.** You must consider Endangered Species Act listed threatened or endangered species (ESA-listed) and/or designated critical habitat(s) under the jurisdiction of both the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) and select the most conservative criterion that applies.

☐ **A** No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of this permit, you certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of this permit. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the USFWS and NMFS information sources used. Attaching aerial image(s) of the site to this NOI is helpful to EPA, USFWS, and NMFS in confirming eligibility under this criterion. Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.]***

☐ **B** Eligibility requirements met by another operator under the 2017 CGP. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your "action area" under eligibility Criterion A, C, D, E, or F of the 2017 CGP and you have confirmed that no additional ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS not considered in the that certification may be present or located in the "action area." To certify your eligibility under this criterion, there must be no lapse of NPDES permit coverage in the other CGP operator's certification. By certifying eligibility under this criterion, you agree to comply with any conditions upon which the other CGP operator's certification was based. You must include in your NOI the NPDES ID from the other 2017CGP operator's notification of authorization under this permit. If your certification is based on another 2017 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in criterion C in your NOI form. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the eligibility criterion of the other CGP NOI, the authorization date, and confirmation that the authorization is effective.]***

If you select criterion B, provide the NPDES ID from the other operator's notification of authorization under this permit: | | | | | | | | | |

☐ **C** Discharges not likely to adversely affect ESA-listed species and/or designated critical habitat. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to adversely affect ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.]***

What ESA-listed species and/or designated critical habitat are located in your "action area":

Distance between your site and the ESA-listed species and/or designated critical habitat within the action area (in miles, state "on site" if the ESA-listed species and/or designated critical habitat is within the area to be disturbed):

☐ **D** Coordination with USFWS and/or NMFS has successfully concluded. Coordination between you and the USFWS and/or NMFS has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS, and resulted in a written concurrence from USFWS and/or NMFS that your site's discharges and discharge-related activities are not likely to adversely affect listed species and/or critical habitat. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies participated in coordination, the field office/regional office(s) providing that coordination, and the date that coordination concluded.]***

☐ **E** ESA Section 7 consultation has successfully concluded. Consultation between a Federal Agency and the USFWS and/or NMFS under section 7 of the ESA has concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, Indicate the result of the consultation:

☐ biological opinion from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

☐ written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat.

You must include copies of the correspondence between yourself and the USFWS and/or NMFS in your SWPPP and this NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the federal action agencie(s) involved, the field office/regional office(s) providing that consultation, any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the consultation was completed.]***

☐ **F** Issuance of section 10 permit. Potential take is authorized through the issuance of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of the site's discharges and discharge-related activities on ESA-listed species and designated critical habitat. You must include copies of the correspondence between yourself and the participating agencies in your SWPPP and your NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies provided a section 10 permit, the field office/regional office(s) providing permit(s), any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the permit was granted.]***

Provide a brief summary of the basis for criterion selection listed above *[the necessary content for a supportive basis statement is provided under the criterion you selected.]*.

IX. Historic Preservation

Are you installing any stormwater controls as described in Appendix E that require subsurface earth disturbance? (Appendix E, Step 1) ☐ YES ☐ NO

If yes, have prior surveys or evaluations conducted on the site have already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E, Step 2) ☐ YES ☐ NO

If no, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? (Appendix E, Step 3) ☐ YES ☐ NO

If no, did the SHPO, THPO, or other tribal representative (whichever applies) respond to you within the 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? (Appendix E, Step 4) ☐ YES ☐ NO

If yes, describe the nature of their response:

- ☐ Written indication that no historic properties will be affected by the installation of stormwater controls.
- ☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions.
- ☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.
- ☐ Other:

X. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name, Middle Initial, Last Name:

Title:

Signature: Date: / /

Email:

Instructions for Completing EPA Form 3510-9

Notice of Intent for the 2017 NPDES Construction General Permit

NPDES Form Date (2/17) This Form Replaces Form 3510-9 (02/12) Form Approved OMB No. 2040-0004

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), federal law prohibits stormwater discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) permit. Operators of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must obtain coverage under an NPDES general permit. For coverage under the 2017 CGP, each person, firm, public organization, or any other entity that meets either of the following criteria must file a Notice of Intent form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with the permit conditions. If you have questions about whether you need a NPDES stormwater permit, or if you need information to determine whether EPA or your state agency is the permitting authority, contact your EPA Regional Office.

Completing the Form

Obtain and read a copy of the 2017 CGP, viewable at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, telephone EPA's NOI Processing Center at (866) 352-7755. **Please submit the original document with signature in ink - do not send a photocopied signature.**

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOI form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See https://www.epa.gov/npdes/contact-us-stormwater#regional

for a list of EPA Regional Office contacts.

Section II. Permit Number

Provide the master permit number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible master permit numbers)

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOI. Refer to Appendix A of the permit for the definition of "operator".

Indicate whether you are seeking coverage under this permit as a "federal operator" as defined in Appendix A.

Also provide a point of contact, the operator's mailing address, county, telephone number, and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the full name, organization, phone number, and email address of the NOI preparer.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

Provide the latitude and longitude of your facility in decimal degrees format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and web-based siting tools, among others. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. For linear construction sites, the measurement should be taken midpoint of the site. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian tribe, and if so, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 10/06/2012). Indicate to the nearest quarter acre the estimated area to be disturbed.

Indicate the type of construction site, if demolition is occurring, and if so, if the structure has at least 10,000 square feet of floor space. Indicate whether the pre-development land use of the site was used for agriculture Appendix A defines "agricultural land" as cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

Indicate whether earth-disturbing activities have already commenced on your project/site. If earth-disturbing activities have commenced on your site because stormwater discharges from the site have been previously covered under a NPDES permit, you must provide the 2012 CGP NPDES ID or the NPDES permit number if coverage was under an individual permit.

Section V. Discharge Information

You must confirm that you understand that the CGP only authorizes the allowable stormwater discharges listed in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2.

Any discharges not expressly authorized under the CGP are not covered by the CGP or the permit shield provision of the CWA Section 402(k) and they cannot become authorized or shielded by disclosure to EPA, state, or local authorities via the NOI to be covered by the permit or by any other means (e.g., in the SWPPP or during an inspection). If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must either be eliminated or covered under another NPDES permit.

Indicate whether discharges from the site will enter into a municipal separate storm sewer system (MS4), as defined in Appendix A.

Also, indicate whether any waters of the U.S. exist within 50 feet from your site. Note that if "yes", you are required to comply with the requirement in Part 2.2.1 of the permit to provide natural buffers or equivalent erosion and sediment controls.

For each unique point of discharge you list, you must specify the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to. You must specify whether any waters of the U.S. that you discharge to are listed as "impaired" as defined in Appendix A, and the pollutants for which the water is impaired. You must identify any Total Maximum Daily Loads (TMDL) that have been completed for any of the waters of the U.S. that you discharge to.

Indicate whether discharges from the site will enter into a water of the U.S. that is designated as a Tier 2, Tier 2.5, or Tier 3 water. A list of Tier 2, 2.5, and 3 waters is provided as Appendix F. If the answer is "yes", name all waters designated as Tier 2, Tier 2.5, or Tier 3 to which the site will discharge.

Section VI. Chemical Treatment Information

Indicate whether the site will use polymers, flocculants, or other treatment chemicals. Indicate whether the site will employ cationic treatment chemicals. If the answer is "yes" to either question, indicate which chemical(s) you will use. Note that you are not eligible for coverage under this permit to use cationic treatment chemicals unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. Examples of cationic treatment chemicals include, but are not limited to, cationic polyacrylamide (C-PAM), PolyDADMAC (POLYDIALLYLDIMETHYLAMMONIUM CHLORIDE), and chitosan.

Section VII. Stormwater Pollution Prevention Plan (SWPPP) Information

All sites eligible for coverage under this permit are required to prepare a SWPPP in advance of filing the NOI, in accordance with Part 7. Indicate whether the SWPPP has been prepared in advance of filing the NOI.

Indicate the street, city, state, and ZIP code where the SWPPP can be found. Indicate the contact information (name, organization, phone, and email) for the person who developed the SWPPP for this project.

Section VIII. Endangered Species Information

Using the instructions in Appendix D, indicate under which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of ESA-listed endangered and threatened species and designated critical habitat. A description of the basis for the criterion selected must also be provided.

If criterion B is selected, provide the NPDES Number for the other operator who had previously certified their eligibility for the CGP under criterion A, C, D, E, or F. The Tracking Number was assigned when the operator received coverage under this permit, and is included in the notice of authorization.

If criterion C is selected, you must attach copies of your site map. See Part 7.2.4 of the permit for information about what is required to be in your site map. You must also specify the federally-listed species and/or federally-designated critical habitat that are located in the "action area" of the project, and provide the distance between the construction site and any listed endangered species and/or their designated critical habitat.

If criterion D, E, or F is selected, attach copies of any communications between you and the U.S. Fish and Wildlife Service and National Marine Fisheries Service and identify the participating agencies and Field Offices/Regional Offices you worked with in the basis statement of this NOI.

Section IX. Historic Preservation

Use the instructions in Appendix E to complete the questions on the NOI form regarding historic preservation.

Section X. Certification Information

The NOI must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Modifying Your NOI

If you have been granted a waiver from your Regional Office from electronic reporting, and if after submitting your NOI you need to correct or update any fields on this NOI form, you may do so by indicating changes on this same form. Paperwork Reduction Act Notice

Public reporting burden for this NOI is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Submitting Your Form

Submit your NOI form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2017 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2017 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting

Appendix K - Notice of Termination (NOT) Form and Instructions

Part 8.3 requires you to use the NPDES eReporting Tool, or “NeT” system, to prepare and submit your NOT electronically. However, if you are given a waiver by the EPA Regional Office to use a paper NOT form, and you elect to use it, you must complete and submit the following form.

NPDES FORM 3510-13	**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF TERMINATION (NOT) FOR THE 2017 NPDES CONSTRUCTION GENERAL PERMIT**	**Form Approved. OMB No. 2040-0004**

Submission of this Notice of Termination constitutes notice that the operator identified in Section III of this form is no longer authorized discharge pursuant to the NPDES Construction General Permit (CGP) from the site identified in Section IV of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOT Form

Have you been granted a waiver from electronic reporting from the Regional Office *? ☐ YES ☐ NO

If yes, check which waiver you have been granted, the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver:

Date approval obtained: / /

*** Note: You must have been given approval by the Regional Office prior to using this paper NOT form. If you have not obtained a waiver, you must file this form electronically using the NDPES eReporting Tool (NeT).**

II. Permit Information

NPDES ID:

Reason for Termination (Check only one):

☐ You have completed all construction activities at your site, and you have met all other requirements in Part 8.2.1.

☐ Another operator has assumed control over all areas of the site and that operator has submitted an NOI and obtained coverage under the CGP.

☐ You have obtained coverage under an individual permit or another general NPDES permit addressing stormwater discharges from the construction site.

III. Operator Information

Operator Name:

Mailing Address:

Street:

City: State: ZIP Code: -

County or Similar Government Division:

Phone: - - Ext.

E-mail:

IV. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location:

City: State: ZIP Code: -

County or Similar Government Division:

V. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name, Middle Initial, Last Name:

Title:

Signature: ______________________________ Date: / /

Email:

Instructions for Completing EPA Form 3510-13

Notice of Termination for the 2017 NPDES Construction General Permit

NPDES Form Date (2/17) This Form Replaces Form 3510-13 (02/12) Form Approved OMB No. 2040-0004

Who May File an NOT Form

Permittees who are presently covered under the EPA-issued 2017 Construction General Permit (CGP) for Stormwater Discharges Associated with Construction Activity may submit an NOT form when: (1) earth-disturbing activities at the site are completed and the conditions in Parts 8.2.1.a through 8.2.1.b are met; or (2) the permittee has transferred all areas under its control to another operator, and that operator has submitted and obtained coverage under this permit; or (3) the permittee has obtained coverage under a different NPDES permit for the same discharges.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp or telephone EPA's NOI Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Approval to Use Paper NOT Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOT form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

Seehttps://www.epa.gov/npdes/contact-us-stormwater#regional for a list of EPA Regional Office contacts.

Section II. Permit Information

Enter the existing NPDES ID assigned to the project . If you do not know the permit tracking number, or contact EPA's NOI Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one.

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOT and is covered by the NPDES ID identified in Section II. Enter the complete mailing address, telephone number, and email address of the operator.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section V. Certification Information

The NOT, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this NOT is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Submitting Your Form:

Submit your NOT form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2017 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2017 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:
https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting

Appendix L – Suggested Format for Request for Chemical Treatment

If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, Part 1.1.9 requires you to notify your applicable EPA Regional Office in advance of submitting your NOI. The EPA Regional Office will authorize coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to an exceedance of water quality standards. To notify your EPA Regional Office, you may use following form.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460
SUGGESTED FORMAT FOR NOTIFYING EPA ABOUT PROPOSED USE OF CATIONIC TREATMENT CHEMICALS
UNDER THE 2017 NPDES CONSTRUCTION GENERAL PERMIT

Under Part 1.1.9 of the 2017 CGP, if you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your Notice of Intent (NOI) until you notify your applicable EPA Regional Office in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. You may use this suggested form to notify your EPA Regional Office about your proposed use of cationic treatment chemicals.

I. Operator Information

Operator Name:

Mailing Address:

Street:

City: State: ZIP Code: -

Phone: - - Ext.

E-mail:

II. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location:

City: State: ZIP Code: -

County or Similar Government Subdivision:

Site contact name (if different from operator):

Site contact phone (if different from operator): - -

Name(s) of receiving waterbodies: ______________________________

____

____

____

III. Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Stormwater Pollution Prevention Plan (SWPPP):
- All receiving waterbodies
- All proposed location(s) of chemical treatment system(s)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All area of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

IV. Responsible Personnel

Treatment System Operator or Company Name (if subcontracted out):

Street/Location:

City: State: Zip Code: -

Responsible personnel. List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

V. Proposed Treatment

Check proposed treatment system.

☐ Chitosan enhanced sand filtration with discharge to infiltration (ground water)

☐ Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).

☐ Chitosan enhanced sand filtration with discharge to surface waters (flow-through).

☐ Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/ discharge)

Check proposed cationic chemical(s) to be used:

☐ FlocClear™ (2% chitosan acetate solution)

☐ StormKlear™ LiquiFloc™ (1% chitosan acetate solution).

☐ ChitoVan™ (1% chitosan acetate solution).

☐ StormKlear™ LiquiFloc™ (3% Chitosan acetate solution)

☐ Other ____

Estimated Treatment Period Start Date: / / Estimated Treatment Period End Date: / /

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

Explain why you have selected this proposed treatment system and chemicals. Include an explanation of why the use of cationic treatment chemicals is necessary at the site. Reference how the soil types on your site influenced your choices. Describe or provide an illustration of how the site of the discharge will be stabilized and why the discharge location will not cause erosion of the discharge water's bank or bed (please note that a permit from the Corps and state agencies may be necessary to place rock in the water body for this stabilization). Attach as many additional sheets as needed for a full explanation. If you have a report from a chemical treatment contractor describing their recommended approach you may attach that.

VI. Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the SWPPP for this project:

- The SWPPP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to tribal waters, I notified the appropriate tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g. cause erosion).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Official First Name, Middle Initial, Last Name:

Title:

Signature: ______________________________ Date: __ / __ / ____

Email:

Instructions for Submitting This Form:

Submit your this form to your applicable EPA Regional Office. Contact information can be found at: https://www.epa.gov/npdes/contact-us-stormwater#regional

Attachment C – NOI and EPA Authorization e-mail

Attachment D – Inspection Form

Attachment E – Corrective Action Form

Attachment F – SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Attachment G –Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: ____

Project Title: ____

Operator(s): ____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform onsite. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: ____

Address: ____

Telephone Number: ______________________

Type of construction service to be provided: ______________________

____

____

Signature: ______________________

Title: ______________________

Date: ______________________

Attachment H – Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**

Attachment I – SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: ____ Date: _____________________

Course Length (hours): ___________________________________

Stormwater Training Topic: (*check as appropriate)*

- ☐ **Sediment and Erosion Controls**
- ☐ **Stabilization Controls**
- ☐ **Pollution Prevention Measures**
- ☐ **Emergency Procedures**
- ☐ **Inspections/Corrective Actions**

Specific Training Objective:____

____

Attendee Roster: (*attach additional pages as necessary)*

No.	**Name of Attendee**	**Company**
1		
2		
3		
4		
5		
6		
7		
8		

Attachment J – Delegation of Authority Form

Delegation of Authority

I, ________________________ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____________________________________ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

____ (name of person or position)
____ (company)
____ (address)
____ (city, state, zip)
____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ____

Company: ____

Title: ____

Signature: ____

Date: ____

Attachment K – Endangered Species Documentation

Attachment L – Historic Preservation Documentation

Attachment M – Rainfall Gauge Recording

Use the table below to record the rainfall gauge readings at the beginning and end of each work day. An example table follows.

Month/Year			Month/Year			Month/Year		
Day	Start time	End time	Day	Start time	End time	Day	Start time	End time
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31			31		

Attachment N – Order of Conditions

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APPENDIX L

COM 97 DISPOSAL SOIL SAMPLE REPORTS

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Lord Associates, Inc.
Environmental Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

May 8, 2018

Mr. Eric Moore
Lamoureaux Pagano Associates, Inc.
108 Grove Street, Suite 300
Worcester, Massachusetts 01605

RE: Disposal Soil Sample Results
Worcester South High School
Worcester, MA.

Dear Eric,

Pursuant to your request, Lord Associates, Inc. (LAI) has prepared the following summary of soil sampling results from the Worcester South High School project in Worcester, Massachusetts. The purpose of this soil sampling was to pre-characterize the soil that may be excavated during development of the property for a new school for off-site disposal.

Method

The locations of the samples were selected by Lamoureaux Pagano Associates, Inc. and coincide with the locations of previous exploratory test pits and test borings completed by LGCI. As such, they may not be representative of the undisturbed natural soil horizon. A copy of the sample location plan is attached.

All samples collected on April 24, 2018 were by hand, using a soil auger to an approximate depth of two feet below surface grade. Samples were placed in laboratory prepared and preserved containers and transported to a state-certified laboratory (Alpha Analytical) in Westboro, Massachusetts for disposal characterization parameters in accordance with MA Comm-97-001 Policy: Reuse & Disposal of Contaminated Soil at Massachusetts landfills.

Results

The results of the testing were compared to Massachusetts RCS-1 Reportable Concentrations. As shown on Table 1, arsenic was detected at each location greater than the RCS-1 standards, ranging from 29.6 to 40.6 mg/kg, with an average concentration of 34.2 mg/kg. These concentrations are entirely consistent with previous findings considered to be of natural origin and exempt from MADEP notification requirements. One sample exceeded the landfill standard of 40 mg/kg.

There were no standards exceeded for other metals detected and no volatile or semi-volatile organic compounds, PCBs, or total petroleum hydrocarbons detected above the laboratory reporting limits. A copy of the original laboratory report is attached.

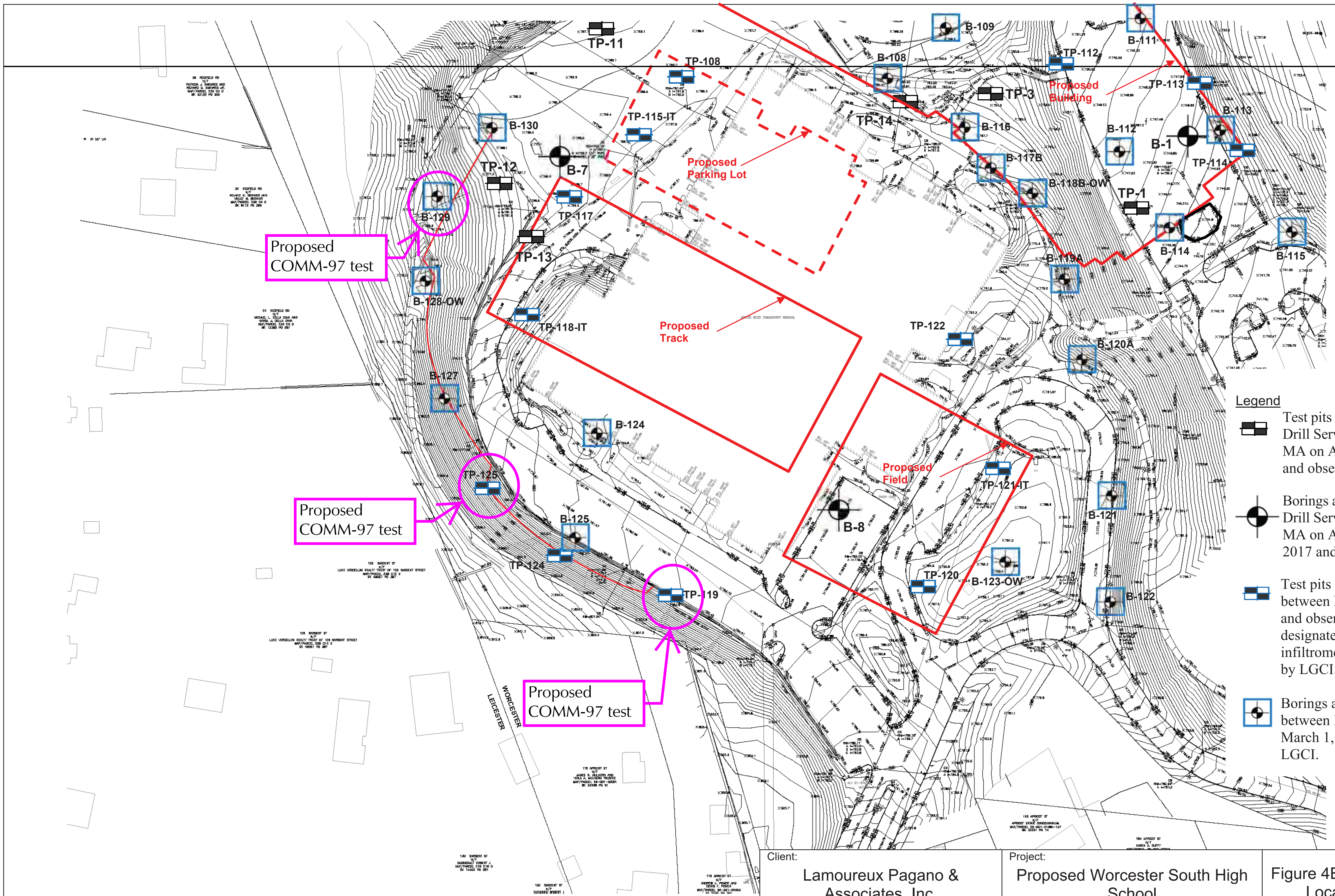
Please contact me if you have any questions.

Sincerely,
LORD ASSOCIATES, INC.

Ralph J. Tella

Ralph J. Tella, LSP, CHMM
President and Senior Project Manager

Attached: Site Sampling Plan
Table 1 Soil Results Summary
Copy of Laboratory Results



Match Line
See Figure 4A for the northern portion of boring and test pit location plan.

Legend

- ▬ Test pits advanced by Northern Drill Service Inc. of Northborough, MA on August 14 and 15, 2017 and observed by LGCI.
- ⊕ Borings advanced by Northern Drill Service Inc. of Northborough, MA on August 10, 2017 and 11, 2017 and observed by LGCI.
- ▭ Test pits advanced by NDS between February 12 and 26, 2018 and observed by LGCI. Test Pits designated with "IT" indicates an infiltrometer test was performed by LGCI.
- ⊕ Borings advanced by NDS between February 13, 2018 and March 1, 2018 and observed by LGCI.

Note: Figure based on progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

Client:	Project:	
Lamoureux Pagano & Associates, Inc.	Proposed Worcester South High School	Figure 4B – Boring and Test Pit Location Plan (South)
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Worcester, MA	LGCI Project No.: 1644 / Date: April 2018

Table 1: Summary of Sample Results

Sample Results Comparison with Reportable Concentrations RCS-1 Criteria.									
CLIENT SAMPLE ID				**B-129**		**TP-125**		**TP-119**	
SAMPLING DATE				**24-APR-18**		**24-APR-18**		**24-APR-18**	
LAB SAMPLE ID				**L1814497-01**		**L1814497-02**		**L1814497-03**	
	CAS Number	**RCS-1-14**	**Units**		**Qual**		**Qual**		**Qual**
General Chemistry									
Specific Conductance @ 25 C	---		umhos/cm	10	U	10	U	10	U
Solids, Total	---		%	68.3		66.9		82	
MCP Total Metals									
Arsenic, Total	7440-38-2	20	mg/kg	40.6		32.4		29.6	
Cadmium, Total	7440-43-9	70	mg/kg	0.893		0.577	U	0.531	
Chromium, Total	7440-47-3	100	mg/kg	42		28.2		31.4	
Lead, Total	7439-92-1	200	mg/kg	13.5		15.4		5.11	
Mercury, Total	7439-97-6	20	mg/kg	0.093	U	0.094	U	0.076	U
MCP Volatile Organics by 5035 High									
1,1,1,2-Tetrachloroethane	630-20-6	0.1	mg/kg	0.07	U	0.071	U	0.052	U
1,1,1-Trichloroethane	71-55-6	30	mg/kg	0.07	U	0.071	U	0.052	U
1,1,2,2-Tetrachloroethane	79-34-5	0.005	mg/kg	0.07	U	0.071	U	0.052	U
1,1,2-Trichloroethane	79-00-5	0.1	mg/kg	0.1	U	0.11	U	0.078	U
1,1-Dichloroethane	75-34-3	0.4	mg/kg	0.1	U	0.11	U	0.078	U
1,1-Dichloroethene	75-35-4	3	mg/kg	0.07	U	0.071	U	0.052	U
1,1-Dichloropropene	563-58-6		mg/kg	0.28	U	0.28	U	0.21	U
1,2,3-Trichlorobenzene	87-61-6		mg/kg	0.28	U	0.28	U	0.21	U
1,2,3-Trichloropropane	96-18-4	100	mg/kg	0.28	U	0.28	U	0.21	U
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.28	U	0.28	U	0.21	U
1,2,4-Trimethylbenzene	95-63-6	1000	mg/kg	0.28	U	0.28	U	0.21	U
1,2-Dibromo-3-chloropropane	96-12-8	10	mg/kg	0.28	U	0.28	U	0.21	U
1,2-Dibromoethane	106-93-4	0.1	mg/kg	0.28	U	0.28	U	0.21	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.28	U	0.28	U	0.21	U
1,2-Dichloroethane	107-06-2	0.1	mg/kg	0.07	U	0.071	U	0.052	U
1,2-Dichloroethene, Total	540-59-0		mg/kg	0.07	U	0.071	U	0.052	U

1,2-Dichloropropane	**78-87-5**	**0.1**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.18**	**U**
1,3,5-Trimethylbenzene	**108-67-8**	**10**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
1,3-Dichlorobenzene	**541-73-1**	**3**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
1,3-Dichloropropane	**142-28-9**	**500**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
1,3-Dichloropropene, Total	**542-75-6**	**0.01**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
1,4-Dichlorobenzene	**106-46-7**	**0.7**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
1,4-Dioxane	**123-91-1**	**0.2**	**mg/kg**	**2.8**	**U**	**2.8**	**U**	**2.1**	**U**
2,2-Dichloropropane	**594-20-7**		**mg/kg**	**0.35**	**U**	**0.35**	**U**	**0.26**	**U**
2-Hexanone	**591-78-6**	**100**	**mg/kg**	**0.7**	**U**	**0.71**	**U**	**0.52**	**U**
Acetone	**67-64-1**	**6**	**mg/kg**	**2.5**	**U**	**2.5**	**U**	**1.9**	**U**
Benzene	**71-43-2**	**2**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Bromobenzene	**108-86-1**	**100**	**mg/kg**	**0.35**	**U**	**0.35**	**U**	**0.26**	**U**
Bromochloromethane	**74-97-5**		**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Bromodichloromethane	**75-27-4**	**0.1**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Bromoform	**75-25-2**	**0.1**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Bromomethane	**74-83-9**	**0.5**	**mg/kg**	**0.14**	**U**	**0.14**	**U**	**0.1**	**U**
Carbon disulfide	**75-15-0**	**100**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Carbon tetrachloride	**56-23-5**	**5**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Chlorobenzene	**108-90-7**	**1**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Chloroethane	**75-00-3**	**100**	**mg/kg**	**0.14**	**U**	**0.14**	**U**	**0.1**	**U**
Chloroform	**67-66-3**	**0.2**	**mg/kg**	**0.1**	**U**	**0.11**	**U**	**0.078**	**U**
Chloromethane	**74-87-3**	**100**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
cis-1,2-Dichloroethene	**156-59-2**	**0.1**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
cis-1,3-Dichloropropene	**10061-01-5**	**0.01**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Dibromochloromethane	**124-48-1**	**0.005**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Dibromomethane	**74-95-3**	**500**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Dichlorodifluoromethane	**75-71-8**	**1000**	**mg/kg**	**0.7**	**U**	**0.71**	**U**	**0.52**	**U**
Diethyl ether	**60-29-7**	**100**	**mg/kg**	**0.35**	**U**	**0.35**	**U**	**0.26**	**U**
Diisopropyl Ether	**108-20-3**	**100**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Ethyl-Tert-Butyl-Ether	**637-92-3**		**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Ethylbenzene	**100-41-4**	**40**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Hexachlorobutadiene	**87-68-3**	**30**	**mg/kg**	**0.28**	**U**	**0.28**	**U**	**0.21**	**U**
Isopropylbenzene	**98-82-8**	**1000**	**mg/kg**	**0.07**	**U**	**0.071**	**U**	**0.052**	**U**
Methyl ethyl ketone	**78-93-3**	**4**	**mg/kg**	**0.7**	**U**	**0.71**	**U**	**0.52**	**U**
Methyl isobutyl ketone	**108-10-1**	**0.4**	**mg/kg**	**0.7**	**U**	**0.71**	**U**	**0.52**	**U**
Methyl tert butyl ether	**1634-04-4**	**0.1**	**mg/kg**	**0.14**	**U**	**0.14**	**U**	**0.1**	**U**
Methylene chloride	**75-09-2**	**0.1**	**mg/kg**	**0.7**	**U**	**0.71**	**U**	**0.52**	**U**

n-Butylbenzene	104-51-8		mg/kg	0.07	U	0.071	U	0.052	U
n-Propylbenzene	103-65-1	100	mg/kg	0.07	U	0.071	U	0.052	U
Naphthalene	91-20-3	4	mg/kg	0.28	U	0.28	U	0.21	U
o-Chlorotoluene	95-49-8	100	mg/kg	0.28	U	0.28	U	0.21	U
o-Xylene	95-47-6	100	mg/kg	0.14	U	0.14	U	0.1	U
p-Chlorotoluene	106-43-4		mg/kg	0.28	U	0.28	U	0.21	U
p-Isopropyltoluene	99-87-6	100	mg/kg	0.07	U	0.071	U	0.052	U
p/m-Xylene	179601-23-1	100	mg/kg	0.14	U	0.14	U	0.1	U
sec-Butylbenzene	135-98-8		mg/kg	0.07	U	0.071	U	0.052	U
Styrene	100-42-5	3	mg/kg	0.14	U	0.14	U	0.1	U
tert-Butylbenzene	98-06-6	100	mg/kg	0.28	U	0.28	U	0.21	U
Tertiary-Amyl Methyl Ether	994-05-8		mg/kg	0.28	U	0.28	U	0.21	U
Tetrachloroethene	127-18-4	1	mg/kg	0.07	U	0.071	U	0.052	U
Tetrahydrofuran	109-99-9	500	mg/kg	0.28	U	0.28	U	0.21	U
Toluene	108-88-3	30	mg/kg	0.1	U	0.11	U	0.078	U
trans-1,2-Dichloroethene	156-60-5	1	mg/kg	0.1	U	0.11	U	0.078	U
trans-1,3-Dichloropropene	10061-02-6	0.01	mg/kg	0.07	U	0.071	U	0.052	U
Trichloroethene	79-01-6	0.3	mg/kg	0.07	U	0.071	U	0.052	U
Trichlorofluoromethane	75-69-4	1000	mg/kg	0.28	U	0.28	U	0.21	U
Vinyl chloride	75-01-4	0.7	mg/kg	0.14	U	0.14	U	0.1	U
Xylenes, Total	1330-20-7	100	mg/kg	0.14	U	0.14	U	0.1	U
MCP Semivolatile Organics									
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.24	U	0.25	U	0.2	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.24	U	0.25	U	0.2	U
1,3-Dichlorobenzene	541-73-1	3	mg/kg	0.24	U	0.25	U	0.2	U
1,4-Dichlorobenzene	106-46-7	0.7	mg/kg	0.24	U	0.25	U	0.2	U
2,4,5-Trichlorophenol	95-95-4	4	mg/kg	0.24	U	0.25	U	0.2	U
2,4,6-Trichlorophenol	88-06-2	0.7	mg/kg	0.14	U	0.15	U	0.12	U
2,4-Dichlorophenol	120-83-2	0.7	mg/kg	0.22	U	0.22	U	0.18	U
2,4-Dimethylphenol	105-67-9	0.7	mg/kg	0.24	U	0.25	U	0.2	U
2,4-Dinitrophenol	51-28-5	3	mg/kg	1.2	U	1.2	U	0.95	U
2,4-Dinitrotoluene	121-14-2	0.7	mg/kg	0.24	U	0.25	U	0.2	U
2,6-Dinitrotoluene	606-20-2	100	mg/kg	0.24	U	0.25	U	0.2	U
2-Chloronaphthalene	91-58-7	1000	mg/kg	0.24	U	0.25	U	0.2	U
2-Chlorophenol	95-57-8	0.7	mg/kg	0.24	U	0.25	U	0.2	U
2-Methylnaphthalene	91-57-6	0.7	mg/kg	0.29	U	0.3	U	0.24	U

2-Methylphenol	**95-48-7**	**500**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
2-Nitrophenol	**88-75-5**	**100**	**mg/kg**	**0.52**	**U**	**0.53**	**U**	**0.43**	**U**
3,3'-Dichlorobenzidine	**91-94-1**	**3**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
3-Methylphenol/4-Methylphenol	**108-39-4**	**500**	**mg/kg**	**0.35**	**U**	**0.35**	**U**	**0.28**	**U**
4-Bromophenyl phenyl ether	**101-55-3**	**100**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
4-Chloroaniline	**106-47-8**	**1**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
4-Nitrophenol	**100-02-7**	**100**	**mg/kg**	**0.34**	**U**	**0.34**	**U**	**0.28**	**U**
Acenaphthene	**83-32-9**	**4**	**mg/kg**	**0.19**	**U**	**0.2**	**U**	**0.16**	**U**
Acenaphthylene	**208-96-8**	**1**	**mg/kg**	**0.19**	**U**	**0.2**	**U**	**0.16**	**U**
Acetophenone	**98-86-2**	**1000**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Aniline	**62-53-3**	**1000**	**mg/kg**	**0.29**	**U**	**0.3**	**U**	**0.24**	**U**
Anthracene	**120-12-7**	**1000**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Azobenzene	**103-33-3**	**50**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Benzo(a)anthracene	**56-55-3**	**7**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Benzo(a)pyrene	**50-32-8**	**2**	**mg/kg**	**0.19**	**U**	**0.2**	**U**	**0.16**	**U**
Benzo(b)fluoranthene	**205-99-2**	**7**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Benzo(ghi)perylene	**191-24-2**	**1000**	**mg/kg**	**0.19**	**U**	**0.2**	**U**	**0.16**	**U**
Benzo(k)fluoranthene	**207-08-9**	**70**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Bis(2-chloroethoxy)methane	**111-91-1**	**500**	**mg/kg**	**0.26**	**U**	**0.26**	**U**	**0.21**	**U**
Bis(2-chloroethyl)ether	**111-44-4**	**0.7**	**mg/kg**	**0.22**	**U**	**0.22**	**U**	**0.18**	**U**
Bis(2-chloroisopropyl)ether	**108-60-1**	**0.7**	**mg/kg**	**0.29**	**U**	**0.3**	**U**	**0.24**	**U**
Bis(2-ethylhexyl)phthalate	**117-81-7**	**90**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Butyl benzyl phthalate	**85-68-7**	**100**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Chrysene	**218-01-9**	**70**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Di-n-butylphthalate	**84-74-2**	**50**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Di-n-octylphthalate	**117-84-0**	**1000**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Dibenzo(a,h)anthracene	**53-70-3**	**0.7**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Dibenzofuran	**132-64-9**	**100**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Diethyl phthalate	**84-66-2**	**10**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Dimethyl phthalate	**131-11-3**	**0.7**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Fluoranthene	**206-44-0**	**1000**	**mg/kg**	**0.14**	**U**	**0.15**		**0.12**	**U**
Fluorene	**86-73-7**	**1000**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Hexachlorobenzene	**118-74-1**	**0.7**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Hexachlorobutadiene	**87-68-3**	**30**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Hexachloroethane	**67-72-1**	**0.7**	**mg/kg**	**0.19**	**U**	**0.2**	**U**	**0.16**	**U**
Indeno(1,2,3-cd)pyrene	**193-39-5**	**7**	**mg/kg**	**0.19**	**U**	**0.2**	**U**	**0.16**	**U**
Isophorone	**78-59-1**	**100**	**mg/kg**	**0.22**	**U**	**0.22**	**U**	**0.18**	**U**

Naphthalene	**91-20-3**	**4**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Nitrobenzene	**98-95-3**	**500**	**mg/kg**	**0.22**	**U**	**0.22**	**U**	**0.18**	**U**
Pentachlorophenol	**87-86-5**	**3**	**mg/kg**	**0.49**	**U**	**0.49**	**U**	**0.4**	**U**
Phenanthrene	**85-01-8**	**10**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
Phenol	**108-95-2**	**1**	**mg/kg**	**0.24**	**U**	**0.25**	**U**	**0.2**	**U**
Pyrene	**129-00-0**	**1000**	**mg/kg**	**0.14**	**U**	**0.15**	**U**	**0.12**	**U**
MCP Polychlorinated Biphenyls									
Aroclor 1016	**12674-11-2**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1221	**11104-28-2**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1232	**11141-16-5**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1242	**53469-21-9**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1248	**12672-29-6**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1254	**11097-69-1**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1260	**11096-82-5**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1262	**37324-23-5**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Aroclor 1268	**11100-14-4**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
PCBs, Total	**1336-36-3**	**1**	**mg/kg**	**0.0482**	**U**	**0.049**	**U**	**0.039**	**U**
Petroleum Hydrocarbon Quantitation									
TPH	**---**	**1000**	**mg/kg**	**48.8**	**U**	**48.8**	**U**	**40.2**	**U**

ANALYTICAL REPORT

Lab Number:	L1814497
Client:	Lord Associates, Inc. 1506 Providence Highway - Suite 30 Norwood, MA 02062
ATTN:	Ralph Tella
Phone:	(781) 255-5554
Project Name:	WORC. SO./VEC
Project Number:	2604
Report Date:	05/02/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1814497-01	B-129	SOIL	SCHOOL	04/24/18 09:50	04/25/18
L1814497-02	TP-125	SOIL	SCHOOL	04/24/18 10:20	04/25/18
L1814497-03	TP-119	SOIL	SCHOOL	04/24/18 11:00	04/25/18

Project Name: WORC. SO./VEC
Project Number: 2604

Lab Number: L1814497
Report Date: 05/02/18

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

In reference to question G:

L1814497-01, -02, and -03: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The initial calibration, associated with L1814497-01, -02, and -03, did not meet the method required minimum response factor on the lowest calibration standard for 4-methyl-2-pentanone (0.0604) and 1,4-dioxane (0.0026), as well as the average response factor for 4-methyl-2-pentanone and 1,4-dioxane.

The continuing calibration standard, associated with L1814497-01, -02, and -03, is outside the acceptance criteria for several compounds; however it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

Total Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom Kelly Stenstrom

Title: Technical Director/Representative Date: 05/02/18

ORGANICS

VOLATILES

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 04/30/18 10:05
Analyst: MV
Percent Solids: 68%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	700	--	1
1,1-Dichloroethane	ND		ug/kg	100	--	1
Chloroform	ND		ug/kg	100	--	1
Carbon tetrachloride	ND		ug/kg	70	--	1
1,2-Dichloropropane	ND		ug/kg	240	--	1
Dibromochloromethane	ND		ug/kg	70	--	1
1,1,2-Trichloroethane	ND		ug/kg	100	--	1
Tetrachloroethene	ND		ug/kg	70	--	1
Chlorobenzene	ND		ug/kg	70	--	1
Trichlorofluoromethane	ND		ug/kg	280	--	1
1,2-Dichloroethane	ND		ug/kg	70	--	1
1,1,1-Trichloroethane	ND		ug/kg	70	--	1
Bromodichloromethane	ND		ug/kg	70	--	1
trans-1,3-Dichloropropene	ND		ug/kg	70	--	1
cis-1,3-Dichloropropene	ND		ug/kg	70	--	1
1,3-Dichloropropene, Total	ND		ug/kg	70	--	1
1,1-Dichloropropene	ND		ug/kg	280	--	1
Bromoform	ND		ug/kg	280	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	70	--	1
Benzene	ND		ug/kg	70	--	1
Toluene	ND		ug/kg	100	--	1
Ethylbenzene	ND		ug/kg	70	--	1
Chloromethane	ND		ug/kg	280	--	1
Bromomethane	ND		ug/kg	140	--	1
Vinyl chloride	ND		ug/kg	140	--	1
Chloroethane	ND		ug/kg	140	--	1
1,1-Dichloroethene	ND		ug/kg	70	--	1
trans-1,2-Dichloroethene	ND		ug/kg	100	--	1

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

MCP Volatile Organics by 5035 High - Westborough Lab

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Trichloroethene	ND		ug/kg	70	--	1
1,2-Dichlorobenzene	ND		ug/kg	280	--	1
1,3-Dichlorobenzene	ND		ug/kg	280	--	1
1,4-Dichlorobenzene	ND		ug/kg	280	--	1
Methyl tert butyl ether	ND		ug/kg	140	--	1
p/m-Xylene	ND		ug/kg	140	--	1
o-Xylene	ND		ug/kg	140	--	1
Xylenes, Total	ND		ug/kg	140	--	1
cis-1,2-Dichloroethene	ND		ug/kg	70	--	1
1,2-Dichloroethene, Total	ND		ug/kg	70	--	1
Dibromomethane	ND		ug/kg	280	--	1
1,2,3-Trichloropropane	ND		ug/kg	280	--	1
Styrene	ND		ug/kg	140	--	1
Dichlorodifluoromethane	ND		ug/kg	700	--	1
Acetone	ND		ug/kg	2500	--	1
Carbon disulfide	ND		ug/kg	280	--	1
Methyl ethyl ketone	ND		ug/kg	700	--	1
Methyl isobutyl ketone	ND		ug/kg	700	--	1
2-Hexanone	ND		ug/kg	700	--	1
Bromochloromethane	ND		ug/kg	280	--	1
Tetrahydrofuran	ND		ug/kg	280	--	1
2,2-Dichloropropane	ND		ug/kg	350	--	1
1,2-Dibromoethane	ND		ug/kg	280	--	1
1,3-Dichloropropane	ND		ug/kg	280	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	70	--	1
Bromobenzene	ND		ug/kg	350	--	1
n-Butylbenzene	ND		ug/kg	70	--	1
sec-Butylbenzene	ND		ug/kg	70	--	1
tert-Butylbenzene	ND		ug/kg	280	--	1
o-Chlorotoluene	ND		ug/kg	280	--	1
p-Chlorotoluene	ND		ug/kg	280	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	280	--	1
Hexachlorobutadiene	ND		ug/kg	280	--	1
Isopropylbenzene	ND		ug/kg	70	--	1
p-Isopropyltoluene	ND		ug/kg	70	--	1
Naphthalene	ND		ug/kg	280	--	1
n-Propylbenzene	ND		ug/kg	70	--	1

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	280	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	280	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	280	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	280	--	1
Diethyl ether	ND		ug/kg	350	--	1
Diisopropyl Ether	ND		ug/kg	280	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	280	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	280	--	1
1,4-Dioxane	ND		ug/kg	2800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	85		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	89		70-130
Dibromofluoromethane	108		70-130

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 04/30/18 10:32
Analyst: MV
Percent Solids: 67%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	710	--	1
1,1-Dichloroethane	ND		ug/kg	110	--	1
Chloroform	ND		ug/kg	110	--	1
Carbon tetrachloride	ND		ug/kg	71	--	1
1,2-Dichloropropane	ND		ug/kg	250	--	1
Dibromochloromethane	ND		ug/kg	71	--	1
1,1,2-Trichloroethane	ND		ug/kg	110	--	1
Tetrachloroethene	ND		ug/kg	71	--	1
Chlorobenzene	ND		ug/kg	71	--	1
Trichlorofluoromethane	ND		ug/kg	280	--	1
1,2-Dichloroethane	ND		ug/kg	71	--	1
1,1,1-Trichloroethane	ND		ug/kg	71	--	1
Bromodichloromethane	ND		ug/kg	71	--	1
trans-1,3-Dichloropropene	ND		ug/kg	71	--	1
cis-1,3-Dichloropropene	ND		ug/kg	71	--	1
1,3-Dichloropropene, Total	ND		ug/kg	71	--	1
1,1-Dichloropropene	ND		ug/kg	280	--	1
Bromoform	ND		ug/kg	280	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	71	--	1
Benzene	ND		ug/kg	71	--	1
Toluene	ND		ug/kg	110	--	1
Ethylbenzene	ND		ug/kg	71	--	1
Chloromethane	ND		ug/kg	280	--	1
Bromomethane	ND		ug/kg	140	--	1
Vinyl chloride	ND		ug/kg	140	--	1
Chloroethane	ND		ug/kg	140	--	1
1,1-Dichloroethene	ND		ug/kg	71	--	1
trans-1,2-Dichloroethene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	71	--	1
1,2-Dichlorobenzene	ND		ug/kg	280	--	1
1,3-Dichlorobenzene	ND		ug/kg	280	--	1
1,4-Dichlorobenzene	ND		ug/kg	280	--	1
Methyl tert butyl ether	ND		ug/kg	140	--	1
p/m-Xylene	ND		ug/kg	140	--	1
o-Xylene	ND		ug/kg	140	--	1
Xylenes, Total	ND		ug/kg	140	--	1
cis-1,2-Dichloroethene	ND		ug/kg	71	--	1
1,2-Dichloroethene, Total	ND		ug/kg	71	--	1
Dibromomethane	ND		ug/kg	280	--	1
1,2,3-Trichloropropane	ND		ug/kg	280	--	1
Styrene	ND		ug/kg	140	--	1
Dichlorodifluoromethane	ND		ug/kg	710	--	1
Acetone	ND		ug/kg	2500	--	1
Carbon disulfide	ND		ug/kg	280	--	1
Methyl ethyl ketone	ND		ug/kg	710	--	1
Methyl isobutyl ketone	ND		ug/kg	710	--	1
2-Hexanone	ND		ug/kg	710	--	1
Bromochloromethane	ND		ug/kg	280	--	1
Tetrahydrofuran	ND		ug/kg	280	--	1
2,2-Dichloropropane	ND		ug/kg	350	--	1
1,2-Dibromoethane	ND		ug/kg	280	--	1
1,3-Dichloropropane	ND		ug/kg	280	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	71	--	1
Bromobenzene	ND		ug/kg	350	--	1
n-Butylbenzene	ND		ug/kg	71	--	1
sec-Butylbenzene	ND		ug/kg	71	--	1
tert-Butylbenzene	ND		ug/kg	280	--	1
o-Chlorotoluene	ND		ug/kg	280	--	1
p-Chlorotoluene	ND		ug/kg	280	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	280	--	1
Hexachlorobutadiene	ND		ug/kg	280	--	1
Isopropylbenzene	ND		ug/kg	71	--	1
p-Isopropyltoluene	ND		ug/kg	71	--	1
Naphthalene	ND		ug/kg	280	--	1
n-Propylbenzene	ND		ug/kg	71	--	1

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	280	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	280	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	280	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	280	--	1
Diethyl ether	ND		ug/kg	350	--	1
Diisopropyl Ether	ND		ug/kg	280	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	280	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	280	--	1
1,4-Dioxane	ND		ug/kg	2800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	86		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	92		70-130
Dibromofluoromethane	106		70-130

SAMPLE RESULTS

Lab ID: L1814497-03
Client ID: TP-119
Sample Location: SCHOOL

Date Collected: 04/24/18 11:00
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 04/30/18 10:58
Analyst: MV
Percent Solids: 82%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	520	--	1
1,1-Dichloroethane	ND		ug/kg	78	--	1
Chloroform	ND		ug/kg	78	--	1
Carbon tetrachloride	ND		ug/kg	52	--	1
1,2-Dichloropropane	ND		ug/kg	180	--	1
Dibromochloromethane	ND		ug/kg	52	--	1
1,1,2-Trichloroethane	ND		ug/kg	78	--	1
Tetrachloroethene	ND		ug/kg	52	--	1
Chlorobenzene	ND		ug/kg	52	--	1
Trichlorofluoromethane	ND		ug/kg	210	--	1
1,2-Dichloroethane	ND		ug/kg	52	--	1
1,1,1-Trichloroethane	ND		ug/kg	52	--	1
Bromodichloromethane	ND		ug/kg	52	--	1
trans-1,3-Dichloropropene	ND		ug/kg	52	--	1
cis-1,3-Dichloropropene	ND		ug/kg	52	--	1
1,3-Dichloropropene, Total	ND		ug/kg	52	--	1
1,1-Dichloropropene	ND		ug/kg	210	--	1
Bromoform	ND		ug/kg	210	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	52	--	1
Benzene	ND		ug/kg	52	--	1
Toluene	ND		ug/kg	78	--	1
Ethylbenzene	ND		ug/kg	52	--	1
Chloromethane	ND		ug/kg	210	--	1
Bromomethane	ND		ug/kg	100	--	1
Vinyl chloride	ND		ug/kg	100	--	1
Chloroethane	ND		ug/kg	100	--	1
1,1-Dichloroethene	ND		ug/kg	52	--	1
trans-1,2-Dichloroethene	ND		ug/kg	78	--	1

SAMPLE RESULTS

Lab ID: L1814497-03
Client ID: TP-119
Sample Location: SCHOOL

Date Collected: 04/24/18 11:00
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	52	--	1
1,2-Dichlorobenzene	ND		ug/kg	210	--	1
1,3-Dichlorobenzene	ND		ug/kg	210	--	1
1,4-Dichlorobenzene	ND		ug/kg	210	--	1
Methyl tert butyl ether	ND		ug/kg	100	--	1
p/m-Xylene	ND		ug/kg	100	--	1
o-Xylene	ND		ug/kg	100	--	1
Xylenes, Total	ND		ug/kg	100	--	1
cis-1,2-Dichloroethene	ND		ug/kg	52	--	1
1,2-Dichloroethene, Total	ND		ug/kg	52	--	1
Dibromomethane	ND		ug/kg	210	--	1
1,2,3-Trichloropropane	ND		ug/kg	210	--	1
Styrene	ND		ug/kg	100	--	1
Dichlorodifluoromethane	ND		ug/kg	520	--	1
Acetone	ND		ug/kg	1900	--	1
Carbon disulfide	ND		ug/kg	210	--	1
Methyl ethyl ketone	ND		ug/kg	520	--	1
Methyl isobutyl ketone	ND		ug/kg	520	--	1
2-Hexanone	ND		ug/kg	520	--	1
Bromochloromethane	ND		ug/kg	210	--	1
Tetrahydrofuran	ND		ug/kg	210	--	1
2,2-Dichloropropane	ND		ug/kg	260	--	1
1,2-Dibromoethane	ND		ug/kg	210	--	1
1,3-Dichloropropane	ND		ug/kg	210	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	52	--	1
Bromobenzene	ND		ug/kg	260	--	1
n-Butylbenzene	ND		ug/kg	52	--	1
sec-Butylbenzene	ND		ug/kg	52	--	1
tert-Butylbenzene	ND		ug/kg	210	--	1
o-Chlorotoluene	ND		ug/kg	210	--	1
p-Chlorotoluene	ND		ug/kg	210	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	210	--	1
Isopropylbenzene	ND		ug/kg	52	--	1
p-Isopropyltoluene	ND		ug/kg	52	--	1
Naphthalene	ND		ug/kg	210	--	1
n-Propylbenzene	ND		ug/kg	52	--	1

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-03	Date Collected:	04/24/18 11:00
Client ID:	TP-119	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	210	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	210	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	210	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	210	--	1
Diethyl ether	ND		ug/kg	260	--	1
Diisopropyl Ether	ND		ug/kg	210	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	210	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	210	--	1
1,4-Dioxane	ND		ug/kg	2100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	109		70-130

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 04/30/18 08:47
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03 Batch: WG1111062-5					
Methylene chloride	ND		ug/kg	500	--
1,1-Dichloroethane	ND		ug/kg	75	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	180	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	75	--
Tetrachloroethene	ND		ug/kg	50	--
Chlorobenzene	ND		ug/kg	50	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	50	--
Bromodichloromethane	ND		ug/kg	50	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	50	--
1,3-Dichloropropene, Total	ND		ug/kg	50	--
1,1-Dichloropropene	ND		ug/kg	200	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	50	--
Benzene	ND		ug/kg	50	--
Toluene	ND		ug/kg	75	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	100	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	50	--

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 04/30/18 08:47
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03 Batch: WG1111062-5					
1,2-Dichlorobenzene	ND		ug/kg	200	--
1,3-Dichlorobenzene	ND		ug/kg	200	--
1,4-Dichlorobenzene	ND		ug/kg	200	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	100	--
Xylenes, Total	ND		ug/kg	100	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	200	--
1,2,3-Trichloropropane	ND		ug/kg	200	--
Styrene	ND		ug/kg	100	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	1800	--
Carbon disulfide	ND		ug/kg	200	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	200	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	250	--
1,2-Dibromoethane	ND		ug/kg	200	--
1,3-Dichloropropane	ND		ug/kg	200	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	50	--
Bromobenzene	ND		ug/kg	250	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	200	--
o-Chlorotoluene	ND		ug/kg	200	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 04/30/18 08:47
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03 Batch: WG1111062-5					
p-Chlorotoluene	ND		ug/kg	200	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	200	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	200	--
1,2,4-Trichlorobenzene	ND		ug/kg	200	--
1,3,5-Trimethylbenzene	ND		ug/kg	200	--
1,2,4-Trimethylbenzene	ND		ug/kg	200	--
Diethyl ether	ND		ug/kg	250	--
Diisopropyl Ether	ND		ug/kg	200	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	200	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	200	--
1,4-Dioxane	ND		ug/kg	2000	--
2-Chloroethylvinyl ether	ND		ug/kg	1000	--
Halothane	ND		ug/kg	2000	--
Ethyl Acetate	ND		ug/kg	1000	--
Freon-113	ND		ug/kg	1000	--
Vinyl acetate	ND		ug/kg	500	--

Tentatively Identified Compounds			
Total TIC Compounds	266	J	ug/kg
Unknown	114	J	ug/kg
Unknown	152	J	ug/kg

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 04/30/18 08:47
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03 Batch: WG1111062-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	108		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604

Lab Number: L1814497
Report Date: 05/02/18

MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03 Batch: WG1111062-3 WG1111062-4

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Methylene chloride	104		102		70-130	2		20
1,1-Dichloroethane	110		104		70-130	6		20
Chloroform	102		98		70-130	4		20
Carbon tetrachloride	127		120		70-130	6		20
1,2-Dichloropropane	97		94		70-130	3		20
Dibromochloromethane	114		114		70-130	0		20
1,1,2-Trichloroethane	95		93		70-130	2		20
Tetrachloroethene	**137**	Q	129		70-130	6		20
Chlorobenzene	112		108		70-130	4		20
Trichlorofluoromethane	72		**67**	Q	70-130	7		20
1,2-Dichloroethane	89		88		70-130	1		20
1,1,1-Trichloroethane	115		110		70-130	4		20
Bromodichloromethane	92		90		70-130	2		20
trans-1,3-Dichloropropene	98		94		70-130	4		20
cis-1,3-Dichloropropene	92		92		70-130	0		20
1,1-Dichloropropene	104		98		70-130	6		20
Bromoform	106		109		70-130	3		20
1,1,2,2-Tetrachloroethane	88		87		70-130	1		20
Benzene	99		96		70-130	3		20
Toluene	108		104		70-130	4		20
Ethylbenzene	103		98		70-130	5		20
Chloromethane	**147**	Q	**131**	Q	70-130	12		20
Bromomethane	77		71		70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604
Lab Number: L1814497
Report Date: 05/02/18

MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03 Batch: WG1111062-3 WG1111062-4

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Vinyl chloride	108		98		70-130	10		20
Chloroethane	74		70		70-130	6		20
1,1-Dichloroethene	**134**	Q	127		70-130	5		20
trans-1,2-Dichloroethene	117		111		70-130	5		20
Trichloroethene	107		104		70-130	3		20
1,2-Dichlorobenzene	114		111		70-130	3		20
1,3-Dichlorobenzene	118		114		70-130	3		20
1,4-Dichlorobenzene	116		112		70-130	4		20
Methyl tert butyl ether	96		95		70-130	1		20
p/m-Xylene	109		103		70-130	6		20
o-Xylene	103		99		70-130	4		20
cis-1,2-Dichloroethene	108		104		70-130	4		20
Dibromomethane	89		88		70-130	1		20
1,2,3-Trichloropropane	83		81		70-130	2		20
Styrene	97		93		70-130	4		20
Dichlorodifluoromethane	**147**	Q	**131**	Q	70-130	12		20
Acetone	99		95		70-130	4		20
Carbon disulfide	117		109		70-130	7		20
Methyl ethyl ketone	93		92		70-130	1		20
Methyl isobutyl ketone	86		88		70-130	2		20
2-Hexanone	85		87		70-130	2		20
Bromochloromethane	113		113		70-130	0		20
Tetrahydrofuran	112		108		70-130	4		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604

Lab Number: L1814497
Report Date: 05/02/18

MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03 Batch: WG1111062-3 WG1111062-4

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
2,2-Dichloropropane	107		103		70-130	4		20
1,2-Dibromoethane	101		99		70-130	2		20
1,3-Dichloropropane	94		91		70-130	3		20
1,1,1,2-Tetrachloroethane	122		118		70-130	3		20
Bromobenzene	115		113		70-130	2		20
n-Butylbenzene	100		94		70-130	6		20
sec-Butylbenzene	106		101		70-130	5		20
tert-Butylbenzene	111		106		70-130	5		20
o-Chlorotoluene	102		98		70-130	4		20
p-Chlorotoluene	100		97		70-130	3		20
1,2-Dibromo-3-chloropropane	95		104		70-130	9		20
Hexachlorobutadiene	129		127		70-130	2		20
Isopropylbenzene	104		99		70-130	5		20
p-Isopropyltoluene	110		104		70-130	6		20
Naphthalene	95		97		70-130	2		20
n-Propylbenzene	100		95		70-130	5		20
1,2,3-Trichlorobenzene	114		113		70-130	1		20
1,2,4-Trichlorobenzene	116		115		70-130	1		20
1,3,5-Trimethylbenzene	106		101		70-130	5		20
1,2,4-Trimethylbenzene	103		99		70-130	4		20
Diethyl ether	90		90		70-130	0		20
Diisopropyl Ether	103		100		70-130	3		20
Ethyl-Tert-Butyl-Ether	94		92		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604
Lab Number: L1814497
Report Date: 05/02/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03 Batch: WG1111062-3 WG1111062-4								
Tertiary-Amyl Methyl Ether	82		82		70-130	0		20
1,4-Dioxane	70		76		70-130	8		20
2-Chloroethylvinyl ether	91		91		70-130	0		20
Halothane	124		120		70-130	3		20
Ethyl Acetate	94		94		70-130	0		20
Freon-113	120		113		70-130	6		20
Vinyl acetate	100		100		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	84		86		70-130
Toluene-d8	100		98		70-130
4-Bromofluorobenzene	91		91		70-130
Dibromofluoromethane	104		104		70-130

SEMIVOLATILES

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	04/26/18 17:43
Analytical Date:	04/27/18 14:54		
Analyst:	ALS		
Percent Solids:	68%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	190	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	240	--	1
Hexachlorobenzene	ND		ug/kg	140	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	220	--	1
2-Chloronaphthalene	ND		ug/kg	240	--	1
1,2-Dichlorobenzene	ND		ug/kg	240	--	1
1,3-Dichlorobenzene	ND		ug/kg	240	--	1
1,4-Dichlorobenzene	ND		ug/kg	240	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	240	--	1
2,4-Dinitrotoluene	ND		ug/kg	240	--	1
2,6-Dinitrotoluene	ND		ug/kg	240	--	1
Azobenzene	ND		ug/kg	240	--	1
Fluoranthene	ND		ug/kg	140	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	240	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	290	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	260	--	1
Hexachlorobutadiene	ND		ug/kg	240	--	1
Hexachloroethane	ND		ug/kg	190	--	1
Isophorone	ND		ug/kg	220	--	1
Naphthalene	ND		ug/kg	240	--	1
Nitrobenzene	ND		ug/kg	220	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	240	--	1
Butyl benzyl phthalate	ND		ug/kg	240	--	1
Di-n-butylphthalate	ND		ug/kg	240	--	1
Di-n-octylphthalate	ND		ug/kg	240	--	1
Diethyl phthalate	ND		ug/kg	240	--	1
Dimethyl phthalate	ND		ug/kg	240	--	1
Benzo(a)anthracene	ND		ug/kg	140	--	1

SAMPLE RESULTS

Lab ID: L1814497-01
Client ID: B-129
Sample Location: SCHOOL

Date Collected: 04/24/18 09:50
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	190	--	1
Benzo(b)fluoranthene	ND		ug/kg	140	--	1
Benzo(k)fluoranthene	ND		ug/kg	140	--	1
Chrysene	ND		ug/kg	140	--	1
Acenaphthylene	ND		ug/kg	190	--	1
Anthracene	ND		ug/kg	140	--	1
Benzo(ghi)perylene	ND		ug/kg	190	--	1
Fluorene	ND		ug/kg	240	--	1
Phenanthrene	ND		ug/kg	140	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	140	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	190	--	1
Pyrene	ND		ug/kg	140	--	1
Aniline	ND		ug/kg	290	--	1
4-Chloroaniline	ND		ug/kg	240	--	1
Dibenzofuran	ND		ug/kg	240	--	1
2-Methylnaphthalene	ND		ug/kg	290	--	1
Acetophenone	ND		ug/kg	240	--	1
2,4,6-Trichlorophenol	ND		ug/kg	140	--	1
2-Chlorophenol	ND		ug/kg	240	--	1
2,4-Dichlorophenol	ND		ug/kg	220	--	1
2,4-Dimethylphenol	ND		ug/kg	240	--	1
2-Nitrophenol	ND		ug/kg	520	--	1
4-Nitrophenol	ND		ug/kg	340	--	1
2,4-Dinitrophenol	ND		ug/kg	1200	--	1
Pentachlorophenol	ND		ug/kg	490	--	1
Phenol	ND		ug/kg	240	--	1
2-Methylphenol	ND		ug/kg	240	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	350	--	1
2,4,5-Trichlorophenol	ND		ug/kg	240	--	1

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	63		30-130
Phenol-d6	69		30-130
Nitrobenzene-d5	71		30-130
2-Fluorobiphenyl	58		30-130
2,4,6-Tribromophenol	76		30-130
4-Terphenyl-d14	44		30-130

SAMPLE RESULTS

Lab ID: L1814497-02
Client ID: TP-125
Sample Location: SCHOOL

Date Collected: 04/24/18 10:20
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8270D
Analytical Date: 04/27/18 15:21
Analyst: ALS
Percent Solids: 67%

Extraction Method: EPA 3546
Extraction Date: 04/26/18 17:43

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	200	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	250	--	1
Hexachlorobenzene	ND		ug/kg	150	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	220	--	1
2-Chloronaphthalene	ND		ug/kg	250	--	1
1,2-Dichlorobenzene	ND		ug/kg	250	--	1
1,3-Dichlorobenzene	ND		ug/kg	250	--	1
1,4-Dichlorobenzene	ND		ug/kg	250	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	250	--	1
2,4-Dinitrotoluene	ND		ug/kg	250	--	1
2,6-Dinitrotoluene	ND		ug/kg	250	--	1
Azobenzene	ND		ug/kg	250	--	1
Fluoranthene	150		ug/kg	150	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	250	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	300	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	260	--	1
Hexachlorobutadiene	ND		ug/kg	250	--	1
Hexachloroethane	ND		ug/kg	200	--	1
Isophorone	ND		ug/kg	220	--	1
Naphthalene	ND		ug/kg	250	--	1
Nitrobenzene	ND		ug/kg	220	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	250	--	1
Butyl benzyl phthalate	ND		ug/kg	250	--	1
Di-n-butylphthalate	ND		ug/kg	250	--	1
Di-n-octylphthalate	ND		ug/kg	250	--	1
Diethyl phthalate	ND		ug/kg	250	--	1
Dimethyl phthalate	ND		ug/kg	250	--	1
Benzo(a)anthracene	ND		ug/kg	150	--	1

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	200	--	1
Benzo(b)fluoranthene	ND		ug/kg	150	--	1
Benzo(k)fluoranthene	ND		ug/kg	150	--	1
Chrysene	ND		ug/kg	150	--	1
Acenaphthylene	ND		ug/kg	200	--	1
Anthracene	ND		ug/kg	150	--	1
Benzo(ghi)perylene	ND		ug/kg	200	--	1
Fluorene	ND		ug/kg	250	--	1
Phenanthrene	ND		ug/kg	150	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	150	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	200	--	1
Pyrene	ND		ug/kg	150	--	1
Aniline	ND		ug/kg	300	--	1
4-Chloroaniline	ND		ug/kg	250	--	1
Dibenzofuran	ND		ug/kg	250	--	1
2-Methylnaphthalene	ND		ug/kg	300	--	1
Acetophenone	ND		ug/kg	250	--	1
2,4,6-Trichlorophenol	ND		ug/kg	150	--	1
2-Chlorophenol	ND		ug/kg	250	--	1
2,4-Dichlorophenol	ND		ug/kg	220	--	1
2,4-Dimethylphenol	ND		ug/kg	250	--	1
2-Nitrophenol	ND		ug/kg	530	--	1
4-Nitrophenol	ND		ug/kg	340	--	1
2,4-Dinitrophenol	ND		ug/kg	1200	--	1
Pentachlorophenol	ND		ug/kg	490	--	1
Phenol	ND		ug/kg	250	--	1
2-Methylphenol	ND		ug/kg	250	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	350	--	1
2,4,5-Trichlorophenol	ND		ug/kg	250	--	1

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	81		30-130
Phenol-d6	86		30-130
Nitrobenzene-d5	87		30-130
2-Fluorobiphenyl	64		30-130
2,4,6-Tribromophenol	79		30-130
4-Terphenyl-d14	49		30-130

SAMPLE RESULTS

Lab ID:	L1814497-03	Date Collected:	04/24/18 11:00
Client ID:	TP-119	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	04/26/18 17:43
Analytical Date:	04/27/18 15:47		
Analyst:	ALS		
Percent Solids:	82%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	--	1
2-Chloronaphthalene	ND		ug/kg	200	--	1
1,2-Dichlorobenzene	ND		ug/kg	200	--	1
1,3-Dichlorobenzene	ND		ug/kg	200	--	1
1,4-Dichlorobenzene	ND		ug/kg	200	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	--	1
2,4-Dinitrotoluene	ND		ug/kg	200	--	1
2,6-Dinitrotoluene	ND		ug/kg	200	--	1
Azobenzene	ND		ug/kg	200	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	240	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	200	--	1
Hexachloroethane	ND		ug/kg	160	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	200	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	200	--	1
Butyl benzyl phthalate	ND		ug/kg	200	--	1
Di-n-butylphthalate	ND		ug/kg	200	--	1
Di-n-octylphthalate	ND		ug/kg	200	--	1
Diethyl phthalate	ND		ug/kg	200	--	1
Dimethyl phthalate	ND		ug/kg	200	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1

SAMPLE RESULTS

Lab ID: L1814497-03
Client ID: TP-119
Sample Location: SCHOOL

Date Collected: 04/24/18 11:00
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	160	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	160	--	1
Fluorene	ND		ug/kg	200	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	160	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	240	--	1
4-Chloroaniline	ND		ug/kg	200	--	1
Dibenzofuran	ND		ug/kg	200	--	1
2-Methylnaphthalene	ND		ug/kg	240	--	1
Acetophenone	ND		ug/kg	200	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	200	--	1
2,4-Dichlorophenol	ND		ug/kg	180	--	1
2,4-Dimethylphenol	ND		ug/kg	200	--	1
2-Nitrophenol	ND		ug/kg	430	--	1
4-Nitrophenol	ND		ug/kg	280	--	1
2,4-Dinitrophenol	ND		ug/kg	950	--	1
Pentachlorophenol	ND		ug/kg	400	--	1
Phenol	ND		ug/kg	200	--	1
2-Methylphenol	ND		ug/kg	200	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	200	--	1

SAMPLE RESULTS

Lab ID:	L1814497-03	Date Collected:	04/24/18 11:00
Client ID:	TP-119	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	81		30-130
Phenol-d6	83		30-130
Nitrobenzene-d5	90		30-130
2-Fluorobiphenyl	85		30-130
2,4,6-Tribromophenol	91		30-130
4-Terphenyl-d14	66		30-130

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	04/27/18 13:35	Extraction Date:	04/26/18 17:43
Analyst:	ALS		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-03 Batch: WG1110166-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	99	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	99	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	99	--
Benzo(a)pyrene	ND		ug/kg	130	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 04/27/18 13:35
Analyst: ALS

Extraction Method: EPA 3546
Extraction Date: 04/26/18 17:43

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-03 Batch: WG1110166-1					
Benzo(b)fluoranthene	ND		ug/kg	99	--
Benzo(k)fluoranthene	ND		ug/kg	99	--
Chrysene	ND		ug/kg	99	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	99	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	99	--
Dibenzo(a,h)anthracene	ND		ug/kg	99	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	99	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	99	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	360	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	800	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 04/27/18 13:35
Analyst: ALS

Extraction Method: EPA 3546
Extraction Date: 04/26/18 17:43

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-03 Batch: WG1110166-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	68		30-130
Phenol-d6	67		30-130
Nitrobenzene-d5	80		30-130
2-Fluorobiphenyl	71		30-130
2,4,6-Tribromophenol	84		30-130
4-Terphenyl-d14	85		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604
Lab Number: L1814497
Report Date: 05/02/18

MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-03 Batch: WG1110166-2 WG1110166-3

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Acenaphthene	80		80		40-140	0		30
1,2,4-Trichlorobenzene	75		75		40-140	0		30
Hexachlorobenzene	82		82		40-140	0		30
Bis(2-chloroethyl)ether	76		76		40-140	0		30
2-Chloronaphthalene	77		78		40-140	1		30
1,2-Dichlorobenzene	74		76		40-140	3		30
1,3-Dichlorobenzene	72		76		40-140	5		30
1,4-Dichlorobenzene	72		74		40-140	3		30
3,3'-Dichlorobenzidine	65		64		40-140	2		30
2,4-Dinitrotoluene	104		102		40-140	2		30
2,6-Dinitrotoluene	96		94		40-140	2		30
Azobenzene	88		88		40-140	0		30
Fluoranthene	88		85		40-140	3		30
4-Bromophenyl phenyl ether	82		83		40-140	1		30
Bis(2-chloroisopropyl)ether	76		78		40-140	3		30
Bis(2-chloroethoxy)methane	78		78		40-140	0		30
Hexachlorobutadiene	77		76		40-140	1		30
Hexachloroethane	78		80		40-140	3		30
Isophorone	81		80		40-140	1		30
Naphthalene	76		77		40-140	1		30
Nitrobenzene	86		86		40-140	0		30
Bis(2-ethylhexyl)phthalate	98		94		40-140	4		30
Butyl benzyl phthalate	98		94		40-140	4		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604

Lab Number: L1814497
Report Date: 05/02/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-03 Batch: WG1110166-2 WG1110166-3								
Di-n-butylphthalate	94		90		40-140	4		30
Di-n-octylphthalate	96		94		40-140	2		30
Diethyl phthalate	87		86		40-140	1		30
Dimethyl phthalate	85		82		40-140	4		30
Benzo(a)anthracene	87		86		40-140	1		30
Benzo(a)pyrene	91		90		40-140	1		30
Benzo(b)fluoranthene	89		91		40-140	2		30
Benzo(k)fluoranthene	86		81		40-140	6		30
Chrysene	82		80		40-140	2		30
Acenaphthylene	87		86		40-140	1		30
Anthracene	88		84		40-140	5		30
Benzo(ghi)perylene	86		86		40-140	0		30
Fluorene	84		86		40-140	2		30
Phenanthrene	84		82		40-140	2		30
Dibenzo(a,h)anthracene	87		87		40-140	0		30
Indeno(1,2,3-cd)pyrene	90		92		40-140	2		30
Pyrene	84		81		40-140	4		30
Aniline	59		59		40-140	0		30
4-Chloroaniline	74		73		40-140	1		30
Dibenzofuran	82		82		40-140	0		30
2-Methylnaphthalene	80		80		40-140	0		30
Acetophenone	81		82		40-140	1		30
2,4,6-Trichlorophenol	91		89		30-130	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC. SO./VEC

Project Number: 2604

Lab Number: L1814497

Report Date: 05/02/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-03 Batch: WG1110166-2 WG1110166-3								
2-Chlorophenol	83		85		30-130	2		30
2,4-Dichlorophenol	87		85		30-130	2		30
2,4-Dimethylphenol	89		91		30-130	2		30
2-Nitrophenol	99		100		30-130	1		30
4-Nitrophenol	110		108		30-130	2		30
2,4-Dinitrophenol	106		104		30-130	2		30
Pentachlorophenol	79		79		30-130	0		30
Phenol	85		84		30-130	1		30
2-Methylphenol	83		84		30-130	1		30
3-Methylphenol/4-Methylphenol	84		84		30-130	0		30
2,4,5-Trichlorophenol	90		91		30-130	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	82		82		30-130
Phenol-d6	80		83		30-130
Nitrobenzene-d5	85		86		30-130
2-Fluorobiphenyl	81		80		30-130
2,4,6-Tribromophenol	92		92		30-130
4-Terphenyl-d14	85		81		30-130

PETROLEUM HYDROCARBONS

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	04/26/18 18:56
Analytical Date:	04/27/18 21:37		
Analyst:	DG		
Percent Solids:	68%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	48800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	84		40-140

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	04/26/18 18:56
Analytical Date:	04/28/18 01:57		
Analyst:	DG		
Percent Solids:	67%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	48800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	97		40-140

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-03	Date Collected:	04/24/18 11:00
Client ID:	TP-119	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	04/26/18 18:56
Analytical Date:	04/27/18 22:09		
Analyst:	DG		
Percent Solids:	82%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	40200	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	96		40-140

Method Blank Analysis
Batch Quality Control

Analytical Method:	1,8015C(M)	Extraction Method:	EPA 3546
Analytical Date:	04/27/18 21:04	Extraction Date:	04/26/18 18:56
Analyst:	DG		

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-03 Batch: WG1110168-1					
TPH	ND		ug/kg	31500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	94		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC. SO./VEC
Project Number: 2604

Lab Number: L1814497
Report Date: 05/02/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-03 Batch: WG1110168-2								
TPH	96		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	90				40-140

PCBS

SAMPLE RESULTS

Lab ID: L1814497-01
Client ID: B-129
Sample Location: SCHOOL

Date Collected: 04/24/18 09:50
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 04/28/18 01:19
Analyst: JW
Percent Solids: 68%

Extraction Method: EPA 3546
Extraction Date: 04/26/18 16:46
Cleanup Method: EPA 3665A
Cleanup Date: 04/27/18
Cleanup Method: EPA 3660B
Cleanup Date: 04/27/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	48.2	--	1	A
Aroclor 1221	ND		ug/kg	48.2	--	1	A
Aroclor 1232	ND		ug/kg	48.2	--	1	A
Aroclor 1242	ND		ug/kg	48.2	--	1	A
Aroclor 1248	ND		ug/kg	48.2	--	1	A
Aroclor 1254	ND		ug/kg	48.2	--	1	A
Aroclor 1260	ND		ug/kg	48.2	--	1	A
Aroclor 1262	ND		ug/kg	48.2	--	1	A
Aroclor 1268	ND		ug/kg	48.2	--	1	A
PCBs, Total	ND		ug/kg	48.2	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	99		30-150	A
Decachlorobiphenyl	92		30-150	A
2,4,5,6-Tetrachloro-m-xylene	108		30-150	B
Decachlorobiphenyl	79		30-150	B

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	04/26/18 16:46
Analytical Date:	04/28/18 01:31	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	04/27/18
Percent Solids:	67%	Cleanup Method:	EPA 3660B
		Cleanup Date:	04/27/18

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**	**Column**
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	49.0	--	1	A
Aroclor 1221	ND		ug/kg	49.0	--	1	A
Aroclor 1232	ND		ug/kg	49.0	--	1	A
Aroclor 1242	ND		ug/kg	49.0	--	1	A
Aroclor 1248	ND		ug/kg	49.0	--	1	A
Aroclor 1254	ND		ug/kg	49.0	--	1	A
Aroclor 1260	ND		ug/kg	49.0	--	1	A
Aroclor 1262	ND		ug/kg	49.0	--	1	A
Aroclor 1268	ND		ug/kg	49.0	--	1	A
PCBs, Total	ND		ug/kg	49.0	--	1	A

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**	**Column**
2,4,5,6-Tetrachloro-m-xylene	95		30-150	A
Decachlorobiphenyl	94		30-150	A
2,4,5,6-Tetrachloro-m-xylene	103		30-150	B
Decachlorobiphenyl	80		30-150	B

SAMPLE RESULTS

Lab ID:	L1814497-03	Date Collected:	04/24/18 11:00
Client ID:	TP-119	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	04/26/18 16:46
Analytical Date:	04/28/18 01:44	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	04/27/18
Percent Solids:	82%	Cleanup Method:	EPA 3660B
		Cleanup Date:	04/27/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	39.0	--	1	A
Aroclor 1221	ND		ug/kg	39.0	--	1	A
Aroclor 1232	ND		ug/kg	39.0	--	1	A
Aroclor 1242	ND		ug/kg	39.0	--	1	A
Aroclor 1248	ND		ug/kg	39.0	--	1	A
Aroclor 1254	ND		ug/kg	39.0	--	1	A
Aroclor 1260	ND		ug/kg	39.0	--	1	A
Aroclor 1262	ND		ug/kg	39.0	--	1	A
Aroclor 1268	ND		ug/kg	39.0	--	1	A
PCBs, Total	ND		ug/kg	39.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	80		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	65		30-150	B

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8082A	Extraction Method:	EPA 3546
Analytical Date:	04/27/18 23:39	Extraction Date:	04/26/18 16:46
Analyst:	JW	Cleanup Method:	EPA 3665A
		Cleanup Date:	04/27/18
		Cleanup Method:	EPA 3660B
		Cleanup Date:	04/27/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-03 Batch: WG1110161-1						
Aroclor 1016	ND		ug/kg	32.0	--	A
Aroclor 1221	ND		ug/kg	32.0	--	A
Aroclor 1232	ND		ug/kg	32.0	--	A
Aroclor 1242	ND		ug/kg	32.0	--	A
Aroclor 1248	ND		ug/kg	32.0	--	A
Aroclor 1254	ND		ug/kg	32.0	--	A
Aroclor 1260	ND		ug/kg	32.0	--	A
Aroclor 1262	ND		ug/kg	32.0	--	A
Aroclor 1268	ND		ug/kg	32.0	--	A
PCBs, Total	ND		ug/kg	32.0	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	101		30-150	A
Decachlorobiphenyl	121		30-150	A
2,4,5,6-Tetrachloro-m-xylene	111		30-150	B
Decachlorobiphenyl	90		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC. SO./VEC

Project Number: 2604

Lab Number: L1814497

Report Date: 05/02/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-03 Batch: WG1110161-2 WG1110161-3									
Aroclor 1016	90		96		40-140	6		30	A
Aroclor 1260	99		105		40-140	6		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	94		97		30-150	A
Decachlorobiphenyl	113		116		30-150	A
2,4,5,6-Tetrachloro-m-xylene	99		101		30-150	B
Decachlorobiphenyl	84		82		30-150	B

METALS

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 68%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	40.6		mg/kg	0.558	--	1	04/26/18 21:45	04/27/18 10:00	EPA 3050B	97,6010C	PE
Cadmium, Total	0.893		mg/kg	0.558	--	1	04/26/18 21:45	04/27/18 10:00	EPA 3050B	97,6010C	PE
Chromium, Total	42.0		mg/kg	0.558	--	1	04/26/18 21:45	04/27/18 10:00	EPA 3050B	97,6010C	PE
Lead, Total	13.5		mg/kg	2.79	--	1	04/26/18 21:45	04/27/18 10:00	EPA 3050B	97,6010C	PE
Mercury, Total	ND		mg/kg	0.093	--	1	04/27/18 08:00	04/30/18 17:54	EPA 7471B	97,7471B	EA

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	67%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	32.4		mg/kg	0.577	--	1	04/26/18 21:45	04/27/18 10:05	EPA 3050B	97,6010C	PE
Cadmium, Total	ND		mg/kg	0.577	--	1	04/26/18 21:45	04/27/18 10:05	EPA 3050B	97,6010C	PE
Chromium, Total	28.2		mg/kg	0.577	--	1	04/26/18 21:45	04/27/18 10:05	EPA 3050B	97,6010C	PE
Lead, Total	15.4		mg/kg	2.88	--	1	04/26/18 21:45	04/27/18 10:05	EPA 3050B	97,6010C	PE
Mercury, Total	ND		mg/kg	0.094	--	1	04/27/18 08:00	04/30/18 17:56	EPA 7471B	97,7471B	EA

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-03	Date Collected:	04/24/18 11:00
Client ID:	TP-119	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 82%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	29.6		mg/kg	0.478	--	1	04/26/18 21:45	04/27/18 10:09	EPA 3050B	97,6010C	PE
Cadmium, Total	0.531		mg/kg	0.478	--	1	04/26/18 21:45	04/27/18 10:09	EPA 3050B	97,6010C	PE
Chromium, Total	31.4		mg/kg	0.478	--	1	04/26/18 21:45	04/27/18 10:09	EPA 3050B	97,6010C	PE
Lead, Total	5.11		mg/kg	2.39	--	1	04/26/18 21:45	04/27/18 10:09	EPA 3050B	97,6010C	PE
Mercury, Total	ND		mg/kg	0.076	--	1	04/27/18 08:00	04/30/18 17:58	EPA 7471B	97,7471B	EA

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1110189-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	04/26/18 21:45	04/27/18 09:28	97,6010C	PE
Cadmium, Total	ND		mg/kg	0.400	--	1	04/26/18 21:45	04/27/18 09:28	97,6010C	PE
Chromium, Total	ND		mg/kg	0.400	--	1	04/26/18 21:45	04/27/18 09:28	97,6010C	PE
Lead, Total	ND		mg/kg	2.00	--	1	04/26/18 21:45	04/27/18 09:28	97,6010C	PE

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1110281-1										
Mercury, Total	ND		mg/kg	0.083	--	1	04/27/18 08:00	04/30/18 17:48	97,7471B	EA

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC. SO./VEC

Project Number: 2604

Lab Number: L1814497

Report Date: 05/02/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1110189-2 WG1110189-3 SRM Lot Number: D098-540								
Arsenic, Total	96		99		83-117	3		30
Cadmium, Total	94		95		82-117	1		30
Chromium, Total	88		91		83-119	3		30
Lead, Total	87		90		82-117	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1110281-2 WG1110281-3 SRM Lot Number: D098-540								
Mercury, Total	88		103		50-149	16		30

INORGANICS
&
MISCELLANEOUS

Project Name:	WORC. SO./VEC	**Lab Number:**	L1814497
Project Number:	2604	**Report Date:**	05/02/18

SAMPLE RESULTS

Lab ID:	L1814497-01	Date Collected:	04/24/18 09:50
Client ID:	B-129	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	04/26/18 17:23	1,9050A	AS
Solids, Total	68.3		%	0.100	NA	1	-	04/26/18 12:45	121,2540G	RI

SAMPLE RESULTS

Lab ID:	L1814497-02	Date Collected:	04/24/18 10:20
Client ID:	TP-125	Date Received:	04/25/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	04/26/18 17:23	1,9050A	AS
Solids, Total	66.9		%	0.100	NA	1	-	04/26/18 12:45	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1814497-03
Client ID: TP-119
Sample Location: SCHOOL

Date Collected: 04/24/18 11:00
Date Received: 04/25/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	04/26/18 17:23	1,9050A	AS
Solids, Total	82.0		%	0.100	NA	1	-	04/26/18 12:45	121,2540G	RI

Lab Control Sample Analysis

Batch Quality Control

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1110181-1								
Specific Conductance	101		-		99-101	-		

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1814497-01A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260H-10(14)
L1814497-01B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1814497-01C	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)
L1814497-02A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260H-10(14)
L1814497-02B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1814497-02C	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)
L1814497-03A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260H-10(14)
L1814497-03B	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1814497-03C	Glass 120ml/4oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

ALPHA

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 4/25/18

ALPHA Job #: L1814497

Client Information

Client: LORD ASSOC. INC.
Address: 1506 PROV. HIGHWAY
NORWOOD, MA.
Phone: 781-255-5554
Email: RTella@LORDENV.com

Project Information

Project Name: WORC. SO. / UEC
Project Location: School
Project #: 2604
Project Manager: RALPH
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☐ Same as Client Info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program ____ Criteria ____

Additional Project Information:

ANALYSIS

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	COM-97						Sample Comments	TOTAL # BOTTLES
14497-01	B-129	4/24/18	9:50	S	RT									X							3
02	TP-125	↓	10:20	↓	↓									X							3
03	TP-119	↓	11:00	↓	↓									X							3
					Container Type	V								A							
					Preservative	F								A							

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
RDTella	4/25/18 1020	KAAL	4/25/18 1029
KAAL	4/25/18 1208	AAL	4/25/18 1206

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
VOLATILES

Client	: Lord Associates, Inc.	**Lab Number**	: L1814497
Project Name	: WORC. SO./VEC	**Project Number**	: 2604
Lab Sample ID	: WG1111062-5	**Lab File ID**	: V17180430A05
Instrument ID	: VOA117		
Matrix	: SOIL	**Analysis Date**	: 04/30/18 08:47

Client Sample No.	Lab Sample ID	Analysis Date
WG1111062-3LCS	WG1111062-3	04/30/18 07:02
WG1111062-4LCSD	WG1111062-4	04/30/18 07:28
B-129	L1814497-01	04/30/18 10:05
TP-125	L1814497-02	04/30/18 10:32
TP-119	L1814497-03	04/30/18 10:58

Continuing Calibration
Form 7

Client : Lord Associates, Inc.
Project Name : WORC. SO./VEC
Instrument ID : VOA117
Lab File ID : V17180430A01
Sample No : WG1111062-2
Channel :

Lab Number : L1814497
Project Number : 2604
Calibration Date : 04/30/18 07:02
Init. Calib. Date(s) : 01/10/18 01/10/18
Init. Calib. Times : 16:01 19:04

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	150	-.02
Dichlorodifluoromethane	0.231	0.34	-	-47.2*	20	214	0
Chloromethane	0.227	0.335	-	-47.6*	20	221	0
Vinyl chloride	0.362	0.391	-	-8	20	147	0
Bromomethane	20	15.366	-	23.2*	20	122	0
Chloroethane	0.341	0.251	-	26.4*	20	115	0
Trichlorofluoromethane	0.863	0.621	-	28*	20	99	0
Ethyl ether	0.145	0.131	-	9.7	20	139	0
1,1-Dichloroethene	0.189	0.253	-	-33.9*	20	199	-.01
Carbon disulfide	20	23.401	-	-17	20	179	0
Freon-113	20	24.056	-	-20.3*	20	187	-.01
Acrolein	20	16.475	-	17.6	20	148	-.02
Methylene chloride	0.268	0.28	-	-4.5	20	167	-.01
Acetone	20	19.764	-	1.2	20	147	-.03
trans-1,2-Dichloroethene	0.241	0.282	-	-17	20	178	-.01
Methyl acetate	0.106	0.105	-	0.9	20	158	-.02
Methyl tert-butyl ether	0.604	0.576	-	4.6	20	154	-.02
tert-Butyl alcohol	0.02	0.016	-	20	20	138	-.02
Diisopropyl ether	0.681	0.703	-	-3.2	20	159	-.02
1,1-Dichloroethane	0.447	0.491	-	-9.8	20	165	-.02
Halothane	0.218	0.27	-	-23.9*	20	186	-.02
Acrylonitrile	0.046	0.05	-	-8.7	20	159	-.02
Ethyl tert-butyl ether	0.708	0.669	-	5.5	20	149	-.02
Vinyl acetate	0.431	0.429	-	0.5	20	155	-.02
cis-1,2-Dichloroethene	0.279	0.3	-	-7.5	20	162	-.02
2,2-Dichloropropane	0.382	0.409	-	-7.1	20	164	-.02
Bromochloromethane	0.125	0.141	-	-12.8	20	167	-.02
Cyclohexane	20	21.41	-	-7.1	20	162	-.02
Chloroform	0.49	0.5	-	-2	20	155	-.02
Ethyl acetate	0.165	0.155	-	6.1	20	145	-.02
Carbon tetrachloride	0.349	0.442	-	-26.6*	20	187	-.02
Tetrahydrofuran	20	22.318	-	-11.6	20	171	-.02
Dibromofluoromethane	0.264	0.273	-	-3.4	20	158	-.02
1,1,1-Trichloroethane	0.402	0.464	-	-15.4	20	171	-.02
2-Butanone	20	18.531	-	7.3	20	141	-.03
1,1-Dichloropropene	0.342	0.357	-	-4.4	20	155	-.02
Benzene	1.09	1.078	-	1.1	20	149	-.02
tert-Amyl methyl ether	0.712	0.585	-	17.8	20	126	-.02
1,2-Dichloroethane-d4	0.265	0.224	-	15.5	20	132	-.03
1,2-Dichloroethane	0.334	0.298	-	10.8	20	139	-.02
Methyl cyclohexane	20	18.465	-	7.7	20	142	-.02
Trichloroethene	0.3	0.321	-	-7	20	161	-.02
Dibromomethane	0.173	0.154	-	11	20	136	-.02
1,2-Dichloropropane	0.283	0.274	-	3.2	20	143	-.02
2-Chloroethyl vinyl ether	0.116	0.106	-	8.6	20	139	-.02

* Value outside of QC limits.

Continuing Calibration
Form 7

Client : Lord Associates, Inc.
Project Name : WORC. SO./VEC
Instrument ID : VOA117
Lab File ID : V17180430A01
Sample No : WG1111062-2
Channel :

Lab Number : L1814497
Project Number : 2604
Calibration Date : 04/30/18 07:02
Init. Calib. Date(s) : 01/10/18 01/10/18
Init. Calib. Times : 16:01 19:04

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Bromodichloromethane	0.387	0.357	-	7.8	20	139	-.03
1,4-Dioxane	0.00229	0.00161	-	29.7*	20	107	-.03
cis-1,3-Dichloropropene	0.442	0.408	-	7.7	20	139	-.02
Chlorobenzene-d5	1	1	-	0	20	139	-.02
Toluene-d8	1.333	1.327	-	0.5	20	136	-.02
Toluene	0.825	0.895	-	-8.5	20	151	-.02
4-Methyl-2-pentanone	0.081	0.07	-	13.6	20	119	-.03
Tetrachloroethene	0.33	0.451	-	-36.7*	20	181	-.02
trans-1,3-Dichloropropene	0.467	0.457	-	2.1	20	138	-.02
Ethyl methacrylate	0.35	0.299	-	14.6	20	123	-.02
1,1,2-Trichloroethane	0.255	0.243	-	4.7	20	134	-.03
Chlorodibromomethane	0.334	0.381	-	-14.1	20	159	-.03
1,3-Dichloropropane	0.435	0.409	-	6	20	129	-.02
1,2-Dibromoethane	0.269	0.272	-	-1.1	20	141	-.03
2-Hexanone	0.148	0.126	-	14.9	20	120	-.03
Chlorobenzene	0.95	1.068	-	-12.4	20	156	-.03
Ethylbenzene	1.699	1.747	-	-2.8	20	144	-.02
1,1,1,2-Tetrachloroethane	0.328	0.399	-	-21.6*	20	173	-.03
p/m Xylene	0.661	0.722	-	-9.2	20	156	-.03
o Xylene	0.674	0.696	-	-3.3	20	150	-.02
Styrene	1.136	1.104	-	2.8	20	145	-.02
1,4-Dichlorobenzene-d4	1	1	-	0	20	140	-.02
Bromoform	0.409	0.435	-	-6.4	20	166	-.02
Isopropylbenzene	3.029	3.15	-	-4	20	146	-.02
4-Bromofluorobenzene	0.925	0.839	-	9.3	20	126	-.02
Bromobenzene	0.735	0.846	-	-15.1	20	166	-.02
n-Propylbenzene	3.818	3.833	-	-0.4	20	140	-.02
1,4-Dichlorobutane	0.728	0.751	-	-3.2	20	150	-.02
1,1,2,2-Tetrachloroethane	0.667	0.586	-	12.1	20	126	-.02
4-Ethyltoluene	3.23	3.304	-	-2.3	20	144	-.02
2-Chlorotoluene	2.142	2.185	-	-2	20	145	-.02
1,3,5-Trimethylbenzene	2.696	2.868	-	-6.4	20	152	-.02
1,2,3-Trichloropropane	0.528	0.436	-	17.4	20	123	-.02
trans-1,4-Dichloro-2-buten	0.142	0.142	-	0	20	136	-.02
4-Chlorotoluene	2.295	2.292	-	0.1	20	139	-.02
tert-Butylbenzene	2.165	2.412	-	-11.4	20	157	-.02
1,2,4-Trimethylbenzene	2.757	2.85	-	-3.4	20	146	-.02
sec-Butylbenzene	3.397	3.609	-	-6.2	20	147	-.02
p-Isopropyltoluene	2.84	3.138	-	-10.5	20	154	-.02
1,3-Dichlorobenzene	1.492	1.76	-	-18	20	168	-.02
1,4-Dichlorobenzene	1.49	1.73	-	-16.1	20	166	-.02
p-Diethylbenzene	1.909	1.976	-	-3.5	20	146	-.02
n-Butylbenzene	3.073	3.075	-	-0.1	20	137	-.02
1,2-Dichlorobenzene	1.37	1.569	-	-14.5	20	161	-.02
1,2,4,5-Tetramethylbenzene	3.069	3.044	-	0.8	20	142	-.02

* Value outside of QC limits.

Continuing Calibration
Form 7

Client	: Lord Associates, Inc.	**Lab Number**	: L1814497
Project Name	: WORC. SO./VEC	**Project Number**	: 2604
Instrument ID	: VOA117	**Calibration Date**	: 04/30/18 07:02
Lab File ID	: V17180430A01	**Init. Calib. Date(s)**	: 01/10/18 01/10/18
Sample No	: WG1111062-2	**Init. Calib. Times**	: 16:01 19:04
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dibromo-3-chloropropan	0.092	0.087	-	5.4	20	142	-.02
1,3,5-Trichlorobenzene	1.198	1.402	-	-17	20	164	-.02
Hexachlorobutadiene	0.515	0.667	-	-29.5*	20	178	-.01
1,2,4-Trichlorobenzene	0.976	1.136	-	-16.4	20	161	-.02
Naphthalene	2.113	2.01	-	4.9	20	138	-.02
1,2,3-Trichlorobenzene	0.899	1.021	-	-13.6	20	164	-.02

* Value outside of QC limits.

DO NOT REMOVE
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Lord Associates, Inc.
Environmental Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

June 5, 2018

Mr. Eric Moore
Lamoureaux Pagano Associates, Inc.
108 Grove Street, Suite 300
Worcester, Massachusetts 01605

RE: Disposal Soil Sample Results
Worcester South High School
Worcester, MA.

Dear Eric,

Pursuant to your request, Lord Associates, Inc. (LAI) has prepared the following summary of soil sampling results from the Worcester South High School project in Worcester, Massachusetts collected on May 29, 2018. The purpose of this soil sampling was to pre-characterize the soil that may be excavated during development of the property for a new school for off-site disposal.

Method

The locations of the samples were selected by Lamoureaux Pagano Associates, Inc. A copy of the sample location plan is attached.

All samples collected by hand, using a soil auger to an approximate depth of one foot below surface grade. Samples were placed in laboratory prepared and preserved containers and transported to a state-certified laboratory (Alpha Analytical) in Westboro, Massachusetts for disposal characterization parameters in accordance with MA Comm-97-001 Policy: Reuse & Disposal of Contaminated Soil at Massachusetts landfills.

Results

The results of the testing were compared to Massachusetts RCS-1 Reportable Concentrations. As shown on **Table 1**, arsenic was detected at each location greater than the RCS-1 standards, ranging from 34 to 48.6 mg/kg, with an average concentration of 38.6 mg/kg. These concentrations are entirely consistent with previous findings considered to be of natural origin and exempt from MADEP notification requirements.

There were no standards exceeded for other metals detected or volatile, semi-volatile organic compounds, PCBs, or total petroleum hydrocarbons detected above the laboratory reporting limits. A copy of the original laboratory report is attached.

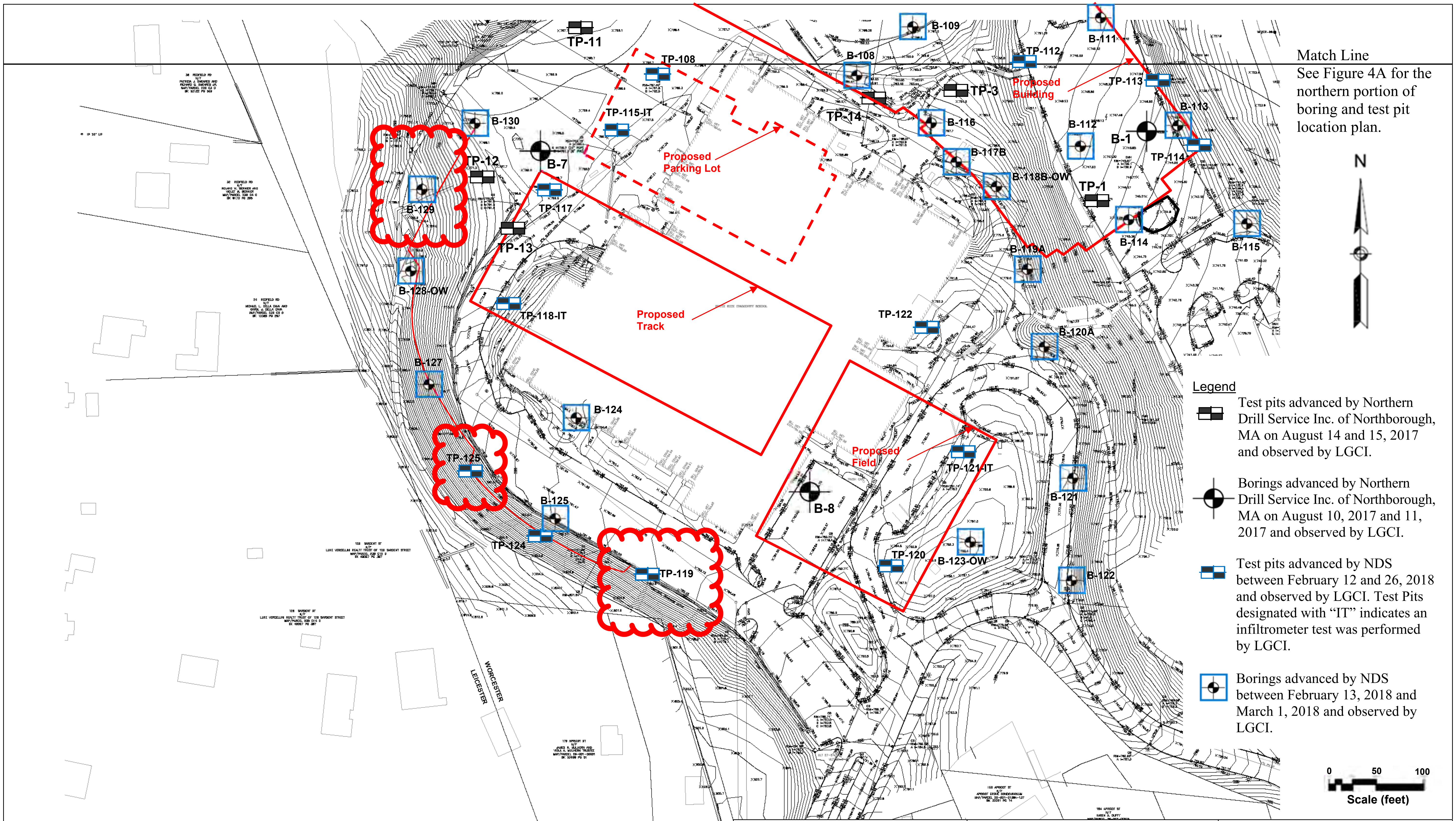
Please contact me if you have any questions.

Sincerely,
LORD ASSOCIATES, INC.

Ralph J. Tella

Ralph J. Tella, LSP, CHMM
President and Senior Project Manager

Attached: Site Sampling Plan
Table 1 Soil Results Summary
Copy of Laboratory Results



Match Line
See Figure 4A for the northern portion of boring and test pit location plan.

Legend

- ▀▄ Test pits advanced by Northern Drill Service Inc. of Northborough, MA on August 14 and 15, 2017 and observed by LGCI.
- ⊕ Borings advanced by Northern Drill Service Inc. of Northborough, MA on August 10, 2017 and 11, 2017 and observed by LGCI.
- ▀▄ Test pits advanced by NDS between February 12 and 26, 2018 and observed by LGCI. Test Pits designated with "IT" indicates an infiltrometer test was performed by LGCI.
- ⊕ Borings advanced by NDS between February 13, 2018 and March 1, 2018 and observed by LGCI.

Note: Figure based on progress survey plan provided to LGCI by Lamoureux Pagano & Associates, Inc. via email on August 4, 2017.

Client:
Lamoureux Pagano & Associates, Inc.

Project:
Proposed Worcester South High School

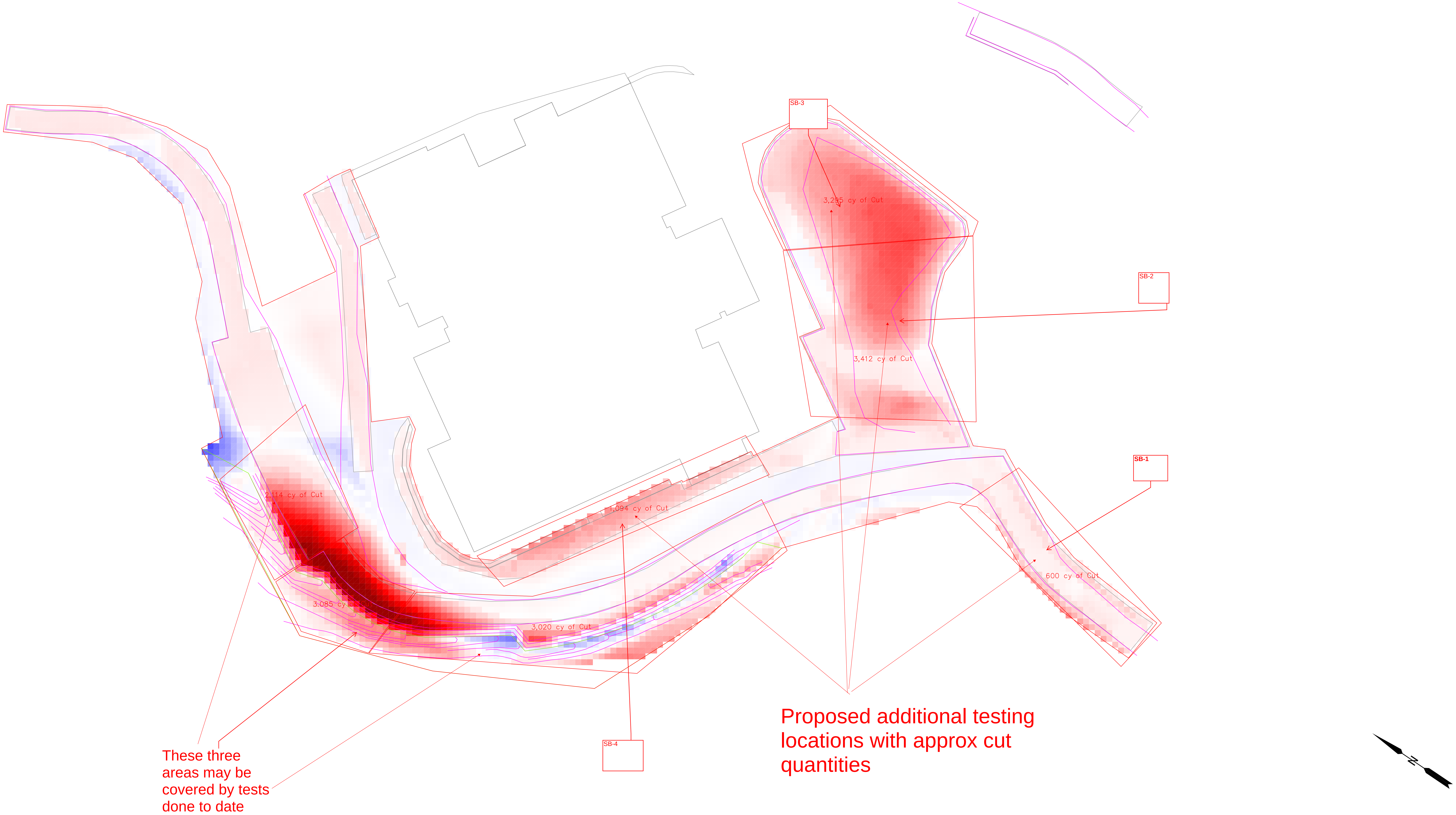
Figure 4B – Boring and Test Pit Location Plan (South)

LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Worcester, MA

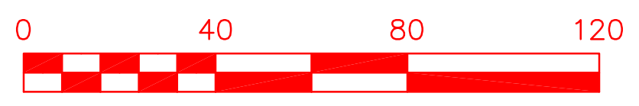
LGCI Project No.:
1644

Date:
April 2018



Proposed additional testing locations with approx cut quantities

These three areas may be covered by tests done to date



SHCS, Worcester		
DRAWN JPR	DATE 0518/18	Enabling Cut Shading Soil Testing T&M Equipment Springfield, MA
APPROVED	DATE	
SCALE 1:40	SHEET	PROJECT NO. 829

Sample Results Comparison with Reportable Concentrations RCS-1 Criteria											
CLIENT SAMPLE ID				**SB-1**		**SB-2**		**SB-3**		**SB-4**	
SAMPLING DATE				**29-MAY-18**		**29-MAY-18**		**29-MAY-18**		**29-MAY-18**	
LAB SAMPLE ID				**L1819658-01**		**L1819658-02**		**L1819658-03**		**L1819658-04**	
	CAS Number	**RCS-1-14**	**Units**		**Qual**		**Qual**		**Qual**		**Qual**
General Chemistry											
Specific Conductance @ 25 C	---		umhos/cm	10	U	10	U	10	U	10	U
Solids, Total	---		%	88.4		82.5		91.4		90.1	
MCP Total Metals											
Arsenic, Total	7440-38-2	20	mg/kg	48.6		39.6		45.2		34	
Cadmium, Total	7440-43-9	70	mg/kg	0.435	U	0.472	U	0.434	U	0.435	U
Chromium, Total	7440-47-3	100	mg/kg	34.1		32.4		31		31.3	
Lead, Total	7439-92-1	200	mg/kg	52.9		42.9		13.7		14.4	
Mercury, Total	7439-97-6	20	mg/kg	0.071	U	0.1		0.069	U	0.159	
MCP Volatile Organics by 5035 High											
1,1,1,2-Tetrachloroethane	630-20-6	0.1	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
1,1,1-Trichloroethane	71-55-6	30	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
1,1,2,2-Tetrachloroethane	79-34-5	0.005	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
1,1,2-Trichloroethane	79-00-5	0.1	mg/kg	0.091	U	0.1	U	0.16	U	0.12	U
1,1-Dichloroethane	75-34-3	0.4	mg/kg	0.091	U	0.1	U	0.16	U	0.12	U
1,1-Dichloroethene	75-35-4	3	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
1,1-Dichloropropene	563-58-6		mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2,3-Trichlorobenzene	87-61-6		mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2,3-Trichloropropane	96-18-4	100	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2,4-Trimethylbenzene	95-63-6	1000	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2-Dibromo-3-chloropropane	96-12-8	10	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2-Dibromoethane	106-93-4	0.1	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,2-Dichloroethane	107-06-2	0.1	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
1,2-Dichloroethene, Total	540-59-0		mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
1,2-Dichloropropane	78-87-5	0.1	mg/kg	0.21	U	0.23	U	0.37	U	0.29	U
1,3,5-Trimethylbenzene	108-67-8	10	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,3-Dichlorobenzene	541-73-1	3	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,3-Dichloropropane	142-28-9	500	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
1,3-Dichloropropene, Total	542-75-6	0.01	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U

1,4-Dichlorobenzene	**106-46-7**	**0.7**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
1,4-Dioxane	**123-91-1**	**0.2**	**mg/kg**	**2.4**	**U**	**2.6**	**U**	**4.2**	**U**	**3.3**	**U**
2,2-Dichloropropane	**594-20-7**		**mg/kg**	**0.3**	**U**	**0.33**	**U**	**0.53**	**U**	**0.41**	**U**
2-Hexanone	**591-78-6**	**100**	**mg/kg**	**0.61**	**U**	**0.66**	**U**	**1.1**	**U**	**0.82**	**U**
Acetone	**67-64-1**	**6**	**mg/kg**	**2.2**	**U**	**2.4**	**U**	**3.8**	**U**	**3**	**U**
Benzene	**71-43-2**	**2**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Bromobenzene	**108-86-1**	**100**	**mg/kg**	**0.3**	**U**	**0.33**	**U**	**0.53**	**U**	**0.41**	**U**
Bromochloromethane	**74-97-5**		**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Bromodichloromethane	**75-27-4**	**0.1**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Bromoform	**75-25-2**	**0.1**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Bromomethane	**74-83-9**	**0.5**	**mg/kg**	**0.12**	**U**	**0.13**	**U**	**0.21**	**U**	**0.16**	**U**
Carbon disulfide	**75-15-0**	**100**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Carbon tetrachloride	**56-23-5**	**5**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Chlorobenzene	**108-90-7**	**1**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Chloroethane	**75-00-3**	**100**	**mg/kg**	**0.12**	**U**	**0.13**	**U**	**0.21**	**U**	**0.16**	**U**
Chloroform	**67-66-3**	**0.2**	**mg/kg**	**0.091**	**U**	**0.1**	**U**	**0.16**	**U**	**0.12**	**U**
Chloromethane	**74-87-3**	**100**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
cis-1,2-Dichloroethene	**156-59-2**	**0.1**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
cis-1,3-Dichloropropene	**10061-01-5**	**0.01**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Dibromochloromethane	**124-48-1**	**0.005**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Dibromomethane	**74-95-3**	**500**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Dichlorodifluoromethane	**75-71-8**	**1000**	**mg/kg**	**0.61**	**U**	**0.66**	**U**	**1.1**	**U**	**0.82**	**U**
Diethyl ether	**60-29-7**	**100**	**mg/kg**	**0.3**	**U**	**0.33**	**U**	**0.53**	**U**	**0.41**	**U**
Diisopropyl Ether	**108-20-3**	**100**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Ethyl-Tert-Butyl-Ether	**637-92-3**		**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Ethylbenzene	**100-41-4**	**40**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Hexachlorobutadiene	**87-68-3**	**30**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
Isopropylbenzene	**98-82-8**	**1000**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Methyl ethyl ketone	**78-93-3**	**4**	**mg/kg**	**0.61**	**U**	**0.66**	**U**	**1.1**	**U**	**0.82**	**U**
Methyl isobutyl ketone	**108-10-1**	**0.4**	**mg/kg**	**0.61**	**U**	**0.66**	**U**	**1.1**	**U**	**0.82**	**U**
Methyl tert butyl ether	**1634-04-4**	**0.1**	**mg/kg**	**0.12**	**U**	**0.13**	**U**	**0.21**	**U**	**0.16**	**U**
Methylene chloride	**75-09-2**	**0.1**	**mg/kg**	**0.61**	**U**	**0.66**	**U**	**1.1**	**U**	**0.82**	**U**
n-Butylbenzene	**104-51-8**		**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
n-Propylbenzene	**103-65-1**	**100**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Naphthalene	**91-20-3**	**4**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
o-Chlorotoluene	**95-49-8**	**100**	**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
o-Xylene	**95-47-6**	**100**	**mg/kg**	**0.12**	**U**	**0.13**	**U**	**0.21**	**U**	**0.16**	**U**
p-Chlorotoluene	**106-43-4**		**mg/kg**	**0.24**	**U**	**0.26**	**U**	**0.42**	**U**	**0.33**	**U**
p-Isopropyltoluene	**99-87-6**	**100**	**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
p/m-Xylene	**179601-23-1**	**100**	**mg/kg**	**0.12**	**U**	**0.13**	**U**	**0.21**	**U**	**0.16**	**U**
sec-Butylbenzene	**135-98-8**		**mg/kg**	**0.061**	**U**	**0.066**	**U**	**0.11**	**U**	**0.082**	**U**
Styrene	**100-42-5**	**3**	**mg/kg**	**0.12**	**U**	**0.13**	**U**	**0.21**	**U**	**0.16**	**U**

tert-Butylbenzene	98-06-6	100	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
Tertiary-Amyl Methyl Ether	994-05-8		mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
Tetrachloroethene	127-18-4	1	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
Tetrahydrofuran	109-99-9	500	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
Toluene	108-88-3	30	mg/kg	0.091	U	0.1	U	0.16	U	0.12	U
trans-1,2-Dichloroethene	156-60-5	1	mg/kg	0.091	U	0.1	U	0.16	U	0.12	U
trans-1,3-Dichloropropene	10061-02-6	0.01	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
Trichloroethene	79-01-6	0.3	mg/kg	0.061	U	0.066	U	0.11	U	0.082	U
Trichlorofluoromethane	75-69-4	1000	mg/kg	0.24	U	0.26	U	0.42	U	0.33	U
Vinyl chloride	75-01-4	0.7	mg/kg	0.12	U	0.13	U	0.21	U	0.16	U
Xylenes, Total	1330-20-7	100	mg/kg	0.12	U	0.13	U	0.21	U	0.16	U
MCP Semivolatile Organics											
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
1,3-Dichlorobenzene	541-73-1	3	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
1,4-Dichlorobenzene	106-46-7	0.7	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2,4,5-Trichlorophenol	95-95-4	4	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2,4,6-Trichlorophenol	88-06-2	0.7	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U
2,4-Dichlorophenol	120-83-2	0.7	mg/kg	0.17	U	0.18	U	0.16	U	0.16	U
2,4-Dimethylphenol	105-67-9	0.7	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2,4-Dinitrophenol	51-28-5	3	mg/kg	0.89	U	0.95	U	0.85	U	0.87	U
2,4-Dinitrotoluene	121-14-2	0.7	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2,6-Dinitrotoluene	606-20-2	100	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2-Chloronaphthalene	91-58-7	1000	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2-Chlorophenol	95-57-8	0.7	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2-Methylnaphthalene	91-57-6	0.7	mg/kg	0.22	U	0.24	U	0.21	U	0.22	U
2-Methylphenol	95-48-7	500	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
2-Nitrophenol	88-75-5	100	mg/kg	0.4	U	0.43	U	0.38	U	0.39	U
3,3'-Dichlorobenzidine	91-94-1	3	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
3-Methylphenol/4-Methylphenol	108-39-4	500	mg/kg	0.27	U	0.29	U	0.26	U	0.26	U
4-Bromophenyl phenyl ether	101-55-3	100	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
4-Chloroaniline	106-47-8	1	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
4-Nitrophenol	100-02-7	100	mg/kg	0.26	U	0.28	U	0.25	U	0.25	U
Acenaphthene	83-32-9	4	mg/kg	0.15	U	0.16	U	0.14	U	0.14	U
Acenaphthylene	208-96-8	1	mg/kg	0.15	U	0.16	U	0.14	U	0.14	U
Acetophenone	98-86-2	1000	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
Aniline	62-53-3	1000	mg/kg	0.22	U	0.24	U	0.21	U	0.22	U
Anthracene	120-12-7	1000	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U
Azobenzene	103-33-3	50	mg/kg	0.18	U	0.2	U	0.18	U	0.18	U
Benzo(a)anthracene	56-55-3	7	mg/kg	0.11	U	0.12	U	0.11	U	0.33	
Benzo(a)pyrene	50-32-8	2	mg/kg	0.15	U	0.16	U	0.14	U	0.28	

Benzo(b)fluoranthene	**205-99-2**	**7**	**mg/kg**	**0.11**	U	**0.12**	U	**0.11**	U	**0.62**	
Benzo(ghi)perylene	**191-24-2**	**1000**	**mg/kg**	**0.15**	U	**0.16**	U	**0.14**	U	**0.23**	
Benzo(k)fluoranthene	**207-08-9**	**70**	**mg/kg**	**0.11**	U	**0.12**	U	**0.11**	U	**0.14**	
Bis(2-chloroethoxy)methane	**111-91-1**	**500**	**mg/kg**	**0.2**	U	**0.21**	U	**0.19**	U	**0.2**	U
Bis(2-chloroethyl)ether	**111-44-4**	**0.7**	**mg/kg**	**0.17**	U	**0.18**	U	**0.16**	U	**0.16**	U
Bis(2-chloroisopropyl)ether	**108-60-1**	**0.7**	**mg/kg**	**0.22**	U	**0.24**	U	**0.21**	U	**0.22**	U
Bis(2-ethylhexyl)phthalate	**117-81-7**	**90**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Butyl benzyl phthalate	**85-68-7**	**100**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Chrysene	**218-01-9**	**70**	**mg/kg**	**0.11**	U	**0.12**	U	**0.11**	U	**0.45**	
Di-n-butylphthalate	**84-74-2**	**50**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Di-n-octylphthalate	**117-84-0**	**1000**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Dibenzo(a,h)anthracene	**53-70-3**	**0.7**	**mg/kg**	**0.11**	U	**0.12**	U	**0.11**	U	**0.11**	U
Dibenzofuran	**132-64-9**	**100**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Diethyl phthalate	**84-66-2**	**10**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Dimethyl phthalate	**131-11-3**	**0.7**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Fluoranthene	**206-44-0**	**1000**	**mg/kg**	**0.12**		**0.12**	U	**0.11**	U	**0.91**	
Fluorene	**86-73-7**	**1000**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Hexachlorobenzene	**118-74-1**	**0.7**	**mg/kg**	**0.11**	U	**0.12**	U	**0.11**	U	**0.11**	U
Hexachlorobutadiene	**87-68-3**	**30**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Hexachloroethane	**67-72-1**	**0.7**	**mg/kg**	**0.15**	U	**0.16**	U	**0.14**	U	**0.14**	U
Indeno(1,2,3-cd)pyrene	**193-39-5**	**7**	**mg/kg**	**0.15**	U	**0.16**	U	**0.14**	U	**0.24**	
Isophorone	**78-59-1**	**100**	**mg/kg**	**0.17**	U	**0.18**	U	**0.16**	U	**0.16**	U
Naphthalene	**91-20-3**	**4**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Nitrobenzene	**98-95-3**	**500**	**mg/kg**	**0.17**	U	**0.18**	U	**0.16**	U	**0.16**	U
Pentachlorophenol	**87-86-5**	**3**	**mg/kg**	**0.37**	U	**0.4**	U	**0.36**	U	**0.36**	U
Phenanthrene	**85-01-8**	**10**	**mg/kg**	**0.11**	U	**0.12**	U	**0.11**	U	**0.24**	
Phenol	**108-95-2**	**1**	**mg/kg**	**0.18**	U	**0.2**	U	**0.18**	U	**0.18**	U
Pyrene	**129-00-0**	**1000**	**mg/kg**	**0.11**		**0.12**	U	**0.11**	U	**0.73**	
MCP Polychlorinated Biphenyls											
Aroclor 1016	**12674-11-2**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1221	**11104-28-2**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1232	**11141-16-5**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1242	**53469-21-9**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1248	**12672-29-6**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1254	**11097-69-1**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1260	**11096-82-5**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1262	**37324-23-5**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Aroclor 1268	**11100-14-4**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
PCBs, Total	**1336-36-3**	**1**	**mg/kg**	**0.0371**	U	**0.0396**	U	**0.0361**	U	**0.0365**	U
Petroleum Hydrocarbon Quantitation											

TPH	**---**	**1000**	**mg/kg**	**36.9**	**U**	**93.6**		**35.5**	**U**	**72.4**	

Alpha Analytical Labs provides this custom reporting format as a convenience to our clients. As such, we cannot be held liable for errors or omissions associated with the regulatory standards listed above and/or the sample results highlighted by comparison with the standards (Effective as of April 25, 2014).

Only compounds detected with reporting limits that exceed the corresponding regulatory standard in at least one sample are included on the summary sheets.

Refer to the laboratory report in Adobe Acrobat (.PDF) format to check results or read any associated project narrative that may be present. In all cases, the signed, hardcopy Alpha Analytical Labs laboratory report is the official document for reporting laboratory results.

ANALYTICAL REPORT

Lab Number:	L1819658
Client:	Lord Associates, Inc. 1506 Providence Highway - Suite 30 Norwood, MA 02062
ATTN:	Ralph Tella
Phone:	(781) 255-5554
Project Name:	WORC SOUTH
Project Number:	2604
Report Date:	06/05/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1819658-01	SB-1	SOIL	SCHOOL	05/29/18 14:20	05/29/18
L1819658-02	SB-2	SOIL	SCHOOL	05/29/18 14:30	05/29/18
L1819658-03	SB-3	SOIL	SCHOOL	05/29/18 15:00	05/29/18
L1819658-04	SB-4	SOIL	SCHOOL	05/29/18 15:09	05/29/18

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The samples were received at the laboratory above the required temperature range. The samples were transported to the laboratory in a cooler with ice packs and delivered directly from the sampling site.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

In reference to question G:

L1819658-01 through -04: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The continuing calibration standard, associated with L1819658-01 through -04, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

Total Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: A Naik Amita Naik

Title: Technical Director/Representative Date: 06/05/18

ORGANICS

VOLATILES

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 06/01/18 10:37
Analyst: JC
Percent Solids: 88%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	610	--	1
1,1-Dichloroethane	ND		ug/kg	91	--	1
Chloroform	ND		ug/kg	91	--	1
Carbon tetrachloride	ND		ug/kg	61	--	1
1,2-Dichloropropane	ND		ug/kg	210	--	1
Dibromochloromethane	ND		ug/kg	61	--	1
1,1,2-Trichloroethane	ND		ug/kg	91	--	1
Tetrachloroethene	ND		ug/kg	61	--	1
Chlorobenzene	ND		ug/kg	61	--	1
Trichlorofluoromethane	ND		ug/kg	240	--	1
1,2-Dichloroethane	ND		ug/kg	61	--	1
1,1,1-Trichloroethane	ND		ug/kg	61	--	1
Bromodichloromethane	ND		ug/kg	61	--	1
trans-1,3-Dichloropropene	ND		ug/kg	61	--	1
cis-1,3-Dichloropropene	ND		ug/kg	61	--	1
1,3-Dichloropropene, Total	ND		ug/kg	61	--	1
1,1-Dichloropropene	ND		ug/kg	240	--	1
Bromoform	ND		ug/kg	240	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	61	--	1
Benzene	ND		ug/kg	61	--	1
Toluene	ND		ug/kg	91	--	1
Ethylbenzene	ND		ug/kg	61	--	1
Chloromethane	ND		ug/kg	240	--	1
Bromomethane	ND		ug/kg	120	--	1
Vinyl chloride	ND		ug/kg	120	--	1
Chloroethane	ND		ug/kg	120	--	1
1,1-Dichloroethene	ND		ug/kg	61	--	1
trans-1,2-Dichloroethene	ND		ug/kg	91	--	1

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	61	--	1
1,2-Dichlorobenzene	ND		ug/kg	240	--	1
1,3-Dichlorobenzene	ND		ug/kg	240	--	1
1,4-Dichlorobenzene	ND		ug/kg	240	--	1
Methyl tert butyl ether	ND		ug/kg	120	--	1
p/m-Xylene	ND		ug/kg	120	--	1
o-Xylene	ND		ug/kg	120	--	1
Xylenes, Total	ND		ug/kg	120	--	1
cis-1,2-Dichloroethene	ND		ug/kg	61	--	1
1,2-Dichloroethene, Total	ND		ug/kg	61	--	1
Dibromomethane	ND		ug/kg	240	--	1
1,2,3-Trichloropropane	ND		ug/kg	240	--	1
Styrene	ND		ug/kg	120	--	1
Dichlorodifluoromethane	ND		ug/kg	610	--	1
Acetone	ND		ug/kg	2200	--	1
Carbon disulfide	ND		ug/kg	240	--	1
Methyl ethyl ketone	ND		ug/kg	610	--	1
Methyl isobutyl ketone	ND		ug/kg	610	--	1
2-Hexanone	ND		ug/kg	610	--	1
Bromochloromethane	ND		ug/kg	240	--	1
Tetrahydrofuran	ND		ug/kg	240	--	1
2,2-Dichloropropane	ND		ug/kg	300	--	1
1,2-Dibromoethane	ND		ug/kg	240	--	1
1,3-Dichloropropane	ND		ug/kg	240	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	61	--	1
Bromobenzene	ND		ug/kg	300	--	1
n-Butylbenzene	ND		ug/kg	61	--	1
sec-Butylbenzene	ND		ug/kg	61	--	1
tert-Butylbenzene	ND		ug/kg	240	--	1
o-Chlorotoluene	ND		ug/kg	240	--	1
p-Chlorotoluene	ND		ug/kg	240	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	240	--	1
Hexachlorobutadiene	ND		ug/kg	240	--	1
Isopropylbenzene	ND		ug/kg	61	--	1
p-Isopropyltoluene	ND		ug/kg	61	--	1
Naphthalene	ND		ug/kg	240	--	1
n-Propylbenzene	ND		ug/kg	61	--	1

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	240	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	240	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	240	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	240	--	1
Diethyl ether	ND		ug/kg	300	--	1
Diisopropyl Ether	ND		ug/kg	240	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	240	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	240	--	1
1,4-Dioxane	ND		ug/kg	2400	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	104		70-130

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Analytical Method: 97,8260C

Analytical Date: 06/01/18 11:03

Analyst: JC

Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	660	--	1
1,1-Dichloroethane	ND		ug/kg	100	--	1
Chloroform	ND		ug/kg	100	--	1
Carbon tetrachloride	ND		ug/kg	66	--	1
1,2-Dichloropropane	ND		ug/kg	230	--	1
Dibromochloromethane	ND		ug/kg	66	--	1
1,1,2-Trichloroethane	ND		ug/kg	100	--	1
Tetrachloroethene	ND		ug/kg	66	--	1
Chlorobenzene	ND		ug/kg	66	--	1
Trichlorofluoromethane	ND		ug/kg	260	--	1
1,2-Dichloroethane	ND		ug/kg	66	--	1
1,1,1-Trichloroethane	ND		ug/kg	66	--	1
Bromodichloromethane	ND		ug/kg	66	--	1
trans-1,3-Dichloropropene	ND		ug/kg	66	--	1
cis-1,3-Dichloropropene	ND		ug/kg	66	--	1
1,3-Dichloropropene, Total	ND		ug/kg	66	--	1
1,1-Dichloropropene	ND		ug/kg	260	--	1
Bromoform	ND		ug/kg	260	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	66	--	1
Benzene	ND		ug/kg	66	--	1
Toluene	ND		ug/kg	100	--	1
Ethylbenzene	ND		ug/kg	66	--	1
Chloromethane	ND		ug/kg	260	--	1
Bromomethane	ND		ug/kg	130	--	1
Vinyl chloride	ND		ug/kg	130	--	1
Chloroethane	ND		ug/kg	130	--	1
1,1-Dichloroethene	ND		ug/kg	66	--	1
trans-1,2-Dichloroethene	ND		ug/kg	100	--	1

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	66	--	1
1,2-Dichlorobenzene	ND		ug/kg	260	--	1
1,3-Dichlorobenzene	ND		ug/kg	260	--	1
1,4-Dichlorobenzene	ND		ug/kg	260	--	1
Methyl tert butyl ether	ND		ug/kg	130	--	1
p/m-Xylene	ND		ug/kg	130	--	1
o-Xylene	ND		ug/kg	130	--	1
Xylenes, Total	ND		ug/kg	130	--	1
cis-1,2-Dichloroethene	ND		ug/kg	66	--	1
1,2-Dichloroethene, Total	ND		ug/kg	66	--	1
Dibromomethane	ND		ug/kg	260	--	1
1,2,3-Trichloropropane	ND		ug/kg	260	--	1
Styrene	ND		ug/kg	130	--	1
Dichlorodifluoromethane	ND		ug/kg	660	--	1
Acetone	ND		ug/kg	2400	--	1
Carbon disulfide	ND		ug/kg	260	--	1
Methyl ethyl ketone	ND		ug/kg	660	--	1
Methyl isobutyl ketone	ND		ug/kg	660	--	1
2-Hexanone	ND		ug/kg	660	--	1
Bromochloromethane	ND		ug/kg	260	--	1
Tetrahydrofuran	ND		ug/kg	260	--	1
2,2-Dichloropropane	ND		ug/kg	330	--	1
1,2-Dibromoethane	ND		ug/kg	260	--	1
1,3-Dichloropropane	ND		ug/kg	260	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	66	--	1
Bromobenzene	ND		ug/kg	330	--	1
n-Butylbenzene	ND		ug/kg	66	--	1
sec-Butylbenzene	ND		ug/kg	66	--	1
tert-Butylbenzene	ND		ug/kg	260	--	1
o-Chlorotoluene	ND		ug/kg	260	--	1
p-Chlorotoluene	ND		ug/kg	260	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	260	--	1
Hexachlorobutadiene	ND		ug/kg	260	--	1
Isopropylbenzene	ND		ug/kg	66	--	1
p-Isopropyltoluene	ND		ug/kg	66	--	1
Naphthalene	ND		ug/kg	260	--	1
n-Propylbenzene	ND		ug/kg	66	--	1

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	260	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	260	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	260	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	260	--	1
Diethyl ether	ND		ug/kg	330	--	1
Diisopropyl Ether	ND		ug/kg	260	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	260	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	260	--	1
1,4-Dioxane	ND		ug/kg	2600	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	104		70-130

SAMPLE RESULTS

Lab ID: L1819658-03
Client ID: SB-3
Sample Location: SCHOOL
Date Collected: 05/29/18 15:00
Date Received: 05/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 06/01/18 11:30
Analyst: JC
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	1100	--	1
1,1-Dichloroethane	ND		ug/kg	160	--	1
Chloroform	ND		ug/kg	160	--	1
Carbon tetrachloride	ND		ug/kg	110	--	1
1,2-Dichloropropane	ND		ug/kg	370	--	1
Dibromochloromethane	ND		ug/kg	110	--	1
1,1,2-Trichloroethane	ND		ug/kg	160	--	1
Tetrachloroethene	ND		ug/kg	110	--	1
Chlorobenzene	ND		ug/kg	110	--	1
Trichlorofluoromethane	ND		ug/kg	420	--	1
1,2-Dichloroethane	ND		ug/kg	110	--	1
1,1,1-Trichloroethane	ND		ug/kg	110	--	1
Bromodichloromethane	ND		ug/kg	110	--	1
trans-1,3-Dichloropropene	ND		ug/kg	110	--	1
cis-1,3-Dichloropropene	ND		ug/kg	110	--	1
1,3-Dichloropropene, Total	ND		ug/kg	110	--	1
1,1-Dichloropropene	ND		ug/kg	420	--	1
Bromoform	ND		ug/kg	420	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	110	--	1
Benzene	ND		ug/kg	110	--	1
Toluene	ND		ug/kg	160	--	1
Ethylbenzene	ND		ug/kg	110	--	1
Chloromethane	ND		ug/kg	420	--	1
Bromomethane	ND		ug/kg	210	--	1
Vinyl chloride	ND		ug/kg	210	--	1
Chloroethane	ND		ug/kg	210	--	1
1,1-Dichloroethene	ND		ug/kg	110	--	1
trans-1,2-Dichloroethene	ND		ug/kg	160	--	1

SAMPLE RESULTS

Lab ID: L1819658-03
Client ID: SB-3
Sample Location: SCHOOL

Date Collected: 05/29/18 15:00
Date Received: 05/29/18
Field Prep: Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	110	--	1
1,2-Dichlorobenzene	ND		ug/kg	420	--	1
1,3-Dichlorobenzene	ND		ug/kg	420	--	1
1,4-Dichlorobenzene	ND		ug/kg	420	--	1
Methyl tert butyl ether	ND		ug/kg	210	--	1
p/m-Xylene	ND		ug/kg	210	--	1
o-Xylene	ND		ug/kg	210	--	1
Xylenes, Total	ND		ug/kg	210	--	1
cis-1,2-Dichloroethene	ND		ug/kg	110	--	1
1,2-Dichloroethene, Total	ND		ug/kg	110	--	1
Dibromomethane	ND		ug/kg	420	--	1
1,2,3-Trichloropropane	ND		ug/kg	420	--	1
Styrene	ND		ug/kg	210	--	1
Dichlorodifluoromethane	ND		ug/kg	1100	--	1
Acetone	ND		ug/kg	3800	--	1
Carbon disulfide	ND		ug/kg	420	--	1
Methyl ethyl ketone	ND		ug/kg	1100	--	1
Methyl isobutyl ketone	ND		ug/kg	1100	--	1
2-Hexanone	ND		ug/kg	1100	--	1
Bromochloromethane	ND		ug/kg	420	--	1
Tetrahydrofuran	ND		ug/kg	420	--	1
2,2-Dichloropropane	ND		ug/kg	530	--	1
1,2-Dibromoethane	ND		ug/kg	420	--	1
1,3-Dichloropropane	ND		ug/kg	420	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	110	--	1
Bromobenzene	ND		ug/kg	530	--	1
n-Butylbenzene	ND		ug/kg	110	--	1
sec-Butylbenzene	ND		ug/kg	110	--	1
tert-Butylbenzene	ND		ug/kg	420	--	1
o-Chlorotoluene	ND		ug/kg	420	--	1
p-Chlorotoluene	ND		ug/kg	420	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	420	--	1
Hexachlorobutadiene	ND		ug/kg	420	--	1
Isopropylbenzene	ND		ug/kg	110	--	1
p-Isopropyltoluene	ND		ug/kg	110	--	1
Naphthalene	ND		ug/kg	420	--	1
n-Propylbenzene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	420	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	420	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	420	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	420	--	1
Diethyl ether	ND		ug/kg	530	--	1
Diisopropyl Ether	ND		ug/kg	420	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	420	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	420	--	1
1,4-Dioxane	ND		ug/kg	4200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	110		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	103		70-130

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 06/01/18 11:56
Analyst: JC
Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	820	--	1
1,1-Dichloroethane	ND		ug/kg	120	--	1
Chloroform	ND		ug/kg	120	--	1
Carbon tetrachloride	ND		ug/kg	82	--	1
1,2-Dichloropropane	ND		ug/kg	290	--	1
Dibromochloromethane	ND		ug/kg	82	--	1
1,1,2-Trichloroethane	ND		ug/kg	120	--	1
Tetrachloroethene	ND		ug/kg	82	--	1
Chlorobenzene	ND		ug/kg	82	--	1
Trichlorofluoromethane	ND		ug/kg	330	--	1
1,2-Dichloroethane	ND		ug/kg	82	--	1
1,1,1-Trichloroethane	ND		ug/kg	82	--	1
Bromodichloromethane	ND		ug/kg	82	--	1
trans-1,3-Dichloropropene	ND		ug/kg	82	--	1
cis-1,3-Dichloropropene	ND		ug/kg	82	--	1
1,3-Dichloropropene, Total	ND		ug/kg	82	--	1
1,1-Dichloropropene	ND		ug/kg	330	--	1
Bromoform	ND		ug/kg	330	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	82	--	1
Benzene	ND		ug/kg	82	--	1
Toluene	ND		ug/kg	120	--	1
Ethylbenzene	ND		ug/kg	82	--	1
Chloromethane	ND		ug/kg	330	--	1
Bromomethane	ND		ug/kg	160	--	1
Vinyl chloride	ND		ug/kg	160	--	1
Chloroethane	ND		ug/kg	160	--	1
1,1-Dichloroethene	ND		ug/kg	82	--	1
trans-1,2-Dichloroethene	ND		ug/kg	120	--	1

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	82	--	1
1,2-Dichlorobenzene	ND		ug/kg	330	--	1
1,3-Dichlorobenzene	ND		ug/kg	330	--	1
1,4-Dichlorobenzene	ND		ug/kg	330	--	1
Methyl tert butyl ether	ND		ug/kg	160	--	1
p/m-Xylene	ND		ug/kg	160	--	1
o-Xylene	ND		ug/kg	160	--	1
Xylenes, Total	ND		ug/kg	160	--	1
cis-1,2-Dichloroethene	ND		ug/kg	82	--	1
1,2-Dichloroethene, Total	ND		ug/kg	82	--	1
Dibromomethane	ND		ug/kg	330	--	1
1,2,3-Trichloropropane	ND		ug/kg	330	--	1
Styrene	ND		ug/kg	160	--	1
Dichlorodifluoromethane	ND		ug/kg	820	--	1
Acetone	ND		ug/kg	3000	--	1
Carbon disulfide	ND		ug/kg	330	--	1
Methyl ethyl ketone	ND		ug/kg	820	--	1
Methyl isobutyl ketone	ND		ug/kg	820	--	1
2-Hexanone	ND		ug/kg	820	--	1
Bromochloromethane	ND		ug/kg	330	--	1
Tetrahydrofuran	ND		ug/kg	330	--	1
2,2-Dichloropropane	ND		ug/kg	410	--	1
1,2-Dibromoethane	ND		ug/kg	330	--	1
1,3-Dichloropropane	ND		ug/kg	330	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	82	--	1
Bromobenzene	ND		ug/kg	410	--	1
n-Butylbenzene	ND		ug/kg	82	--	1
sec-Butylbenzene	ND		ug/kg	82	--	1
tert-Butylbenzene	ND		ug/kg	330	--	1
o-Chlorotoluene	ND		ug/kg	330	--	1
p-Chlorotoluene	ND		ug/kg	330	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	330	--	1
Hexachlorobutadiene	ND		ug/kg	330	--	1
Isopropylbenzene	ND		ug/kg	82	--	1
p-Isopropyltoluene	ND		ug/kg	82	--	1
Naphthalene	ND		ug/kg	330	--	1
n-Propylbenzene	ND		ug/kg	82	--	1

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	330	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	330	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	330	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	330	--	1
Diethyl ether	ND		ug/kg	410	--	1
Diisopropyl Ether	ND		ug/kg	330	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	330	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	330	--	1
1,4-Dioxane	ND		ug/kg	3300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	103		70-130

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 06/01/18 09:19
Analyst: JC

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 01-04 Batch: WG1121503-5					
Methylene chloride	ND		ug/kg	500	--
1,1-Dichloroethane	ND		ug/kg	75	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	180	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	75	--
Tetrachloroethene	ND		ug/kg	50	--
Chlorobenzene	ND		ug/kg	50	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	50	--
Bromodichloromethane	ND		ug/kg	50	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	50	--
1,3-Dichloropropene, Total	ND		ug/kg	50	--
1,1-Dichloropropene	ND		ug/kg	200	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	50	--
Benzene	ND		ug/kg	50	--
Toluene	ND		ug/kg	75	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	100	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	50	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 06/01/18 09:19
Analyst: JC

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 01-04 Batch: WG1121503-5					
1,2-Dichlorobenzene	ND		ug/kg	200	--
1,3-Dichlorobenzene	ND		ug/kg	200	--
1,4-Dichlorobenzene	ND		ug/kg	200	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	100	--
Xylenes, Total	ND		ug/kg	100	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	200	--
1,2,3-Trichloropropane	ND		ug/kg	200	--
Styrene	ND		ug/kg	100	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	1800	--
Carbon disulfide	ND		ug/kg	200	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	200	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	250	--
1,2-Dibromoethane	ND		ug/kg	200	--
1,3-Dichloropropane	ND		ug/kg	200	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	50	--
Bromobenzene	ND		ug/kg	250	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	200	--
o-Chlorotoluene	ND		ug/kg	200	--

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8260C
Analytical Date:	06/01/18 09:19
Analyst:	JC

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 01-04 Batch: WG1121503-5					
p-Chlorotoluene	ND		ug/kg	200	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	200	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	200	--
1,2,4-Trichlorobenzene	ND		ug/kg	200	--
1,3,5-Trimethylbenzene	ND		ug/kg	200	--
1,2,4-Trimethylbenzene	ND		ug/kg	200	--
Diethyl ether	ND		ug/kg	250	--
Diisopropyl Ether	ND		ug/kg	200	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	200	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	200	--
1,4-Dioxane	ND		ug/kg	2000	--
2-Chloroethylvinyl ether	ND		ug/kg	1000	--
Halothane	ND		ug/kg	2000	--
Ethyl Acetate	ND		ug/kg	1000	--
Freon-113	ND		ug/kg	1000	--
Vinyl acetate	ND		ug/kg	500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	104		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-04 Batch: WG1121503-3 WG1121503-4								
Methylene chloride	89		91		70-130	2		20
1,1-Dichloroethane	92		92		70-130	0		20
Chloroform	99		100		70-130	1		20
Carbon tetrachloride	89		90		70-130	1		20
1,2-Dichloropropane	93		93		70-130	0		20
Dibromochloromethane	86		91		70-130	6		20
1,1,2-Trichloroethane	92		96		70-130	4		20
Tetrachloroethene	78		78		70-130	0		20
Chlorobenzene	86		86		70-130	0		20
Trichlorofluoromethane	**134**	Q	**134**	Q	70-130	0		20
1,2-Dichloroethane	102		104		70-130	2		20
1,1,1-Trichloroethane	93		94		70-130	1		20
Bromodichloromethane	98		102		70-130	4		20
trans-1,3-Dichloropropene	93		94		70-130	1		20
cis-1,3-Dichloropropene	97		97		70-130	0		20
1,1-Dichloropropene	95		93		70-130	2		20
Bromoform	80		84		70-130	5		20
1,1,2,2-Tetrachloroethane	90		94		70-130	4		20
Benzene	94		95		70-130	1		20
Toluene	86		83		70-130	4		20
Ethylbenzene	89		87		70-130	2		20
Chloromethane	73		72		70-130	1		20
Bromomethane	**147**	Q	**146**	Q	70-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SOUTH

Project Number: 2604

Lab Number: L1819658

Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-04 Batch: WG1121503-3 WG1121503-4								
Vinyl chloride	110		107		70-130	3		20
Chloroethane	**148**	Q	**150**	Q	70-130	1		20
1,1-Dichloroethene	83		82		70-130	1		20
trans-1,2-Dichloroethene	87		88		70-130	1		20
Trichloroethene	95		93		70-130	2		20
1,2-Dichlorobenzene	84		84		70-130	0		20
1,3-Dichlorobenzene	84		84		70-130	0		20
1,4-Dichlorobenzene	84		84		70-130	0		20
Methyl tert butyl ether	94		99		70-130	5		20
p/m-Xylene	89		88		70-130	1		20
o-Xylene	90		89		70-130	1		20
cis-1,2-Dichloroethene	93		94		70-130	1		20
Dibromomethane	102		108		70-130	6		20
1,2,3-Trichloropropane	87		90		70-130	3		20
Styrene	90		90		70-130	0		20
Dichlorodifluoromethane	76		74		70-130	3		20
Acetone	99		112		70-130	12		20
Carbon disulfide	78		79		70-130	1		20
Methyl ethyl ketone	78		85		70-130	9		20
Methyl isobutyl ketone	78		82		70-130	5		20
2-Hexanone	80		84		70-130	5		20
Bromochloromethane	95		100		70-130	5		20
Tetrahydrofuran	81		86		70-130	6		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SOUTH

Project Number: 2604

Lab Number: L1819658

Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-04 Batch: WG1121503-3 WG1121503-4								
2,2-Dichloropropane	95		97		70-130	2		20
1,2-Dibromoethane	89		93		70-130	4		20
1,3-Dichloropropane	92		94		70-130	2		20
1,1,1,2-Tetrachloroethane	86		85		70-130	1		20
Bromobenzene	79		80		70-130	1		20
n-Butylbenzene	91		88		70-130	3		20
sec-Butylbenzene	85		84		70-130	1		20
tert-Butylbenzene	82		80		70-130	2		20
o-Chlorotoluene	83		83		70-130	0		20
p-Chlorotoluene	84		83		70-130	1		20
1,2-Dibromo-3-chloropropane	75		79		70-130	5		20
Hexachlorobutadiene	**66**	Q	**64**	Q	70-130	3		20
Isopropylbenzene	85		83		70-130	2		20
p-Isopropyltoluene	84		82		70-130	2		20
Naphthalene	80		84		70-130	5		20
n-Propylbenzene	88		85		70-130	3		20
1,2,3-Trichlorobenzene	79		78		70-130	1		20
1,2,4-Trichlorobenzene	80		78		70-130	3		20
1,3,5-Trimethylbenzene	86		84		70-130	2		20
1,2,4-Trimethylbenzene	86		84		70-130	2		20
Diethyl ether	113		118		70-130	4		20
Diisopropyl Ether	84		85		70-130	1		20
Ethyl-Tert-Butyl-Ether	90		94		70-130	4		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-04 Batch: WG1121503-3 WG1121503-4								
Tertiary-Amyl Methyl Ether	96		97		70-130	1		20
1,4-Dioxane	80		94		70-130	16		20
2-Chloroethylvinyl ether	95		100		70-130	5		20
Halothane	84		84		70-130	0		20
Ethyl Acetate	83		88		70-130	6		20
Freon-113	83		83		70-130	0		20
Vinyl acetate	90		94		70-130	4		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	106		108		70-130
Toluene-d8	97		97		70-130
4-Bromofluorobenzene	96		96		70-130
Dibromofluoromethane	101		103		70-130

SEMIVOLATILES

SAMPLE RESULTS

Lab ID: L1819658-01
Client ID: SB-1
Sample Location: SCHOOL

Date Collected: 05/29/18 14:20
Date Received: 05/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8270D
Analytical Date: 06/04/18 13:44
Analyst: RC
Percent Solids: 88%

Extraction Method: EPA 3546
Extraction Date: 05/31/18 20:44

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	120		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	110		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	400	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	890	--	1
Pentachlorophenol	ND		ug/kg	370	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

MCP Semivolatile Organics - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	63		30-130
Phenol-d6	67		30-130
Nitrobenzene-d5	73		30-130
2-Fluorobiphenyl	72		30-130
2,4,6-Tribromophenol	77		30-130
4-Terphenyl-d14	66		30-130

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	05/31/18 20:44
Analytical Date:	06/04/18 14:09		
Analyst:	ALS		
Percent Solids:	83%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	--	1
2-Chloronaphthalene	ND		ug/kg	200	--	1
1,2-Dichlorobenzene	ND		ug/kg	200	--	1
1,3-Dichlorobenzene	ND		ug/kg	200	--	1
1,4-Dichlorobenzene	ND		ug/kg	200	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	--	1
2,4-Dinitrotoluene	ND		ug/kg	200	--	1
2,6-Dinitrotoluene	ND		ug/kg	200	--	1
Azobenzene	ND		ug/kg	200	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	240	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	200	--	1
Hexachloroethane	ND		ug/kg	160	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	200	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	200	--	1
Butyl benzyl phthalate	ND		ug/kg	200	--	1
Di-n-butylphthalate	ND		ug/kg	200	--	1
Di-n-octylphthalate	ND		ug/kg	200	--	1
Diethyl phthalate	ND		ug/kg	200	--	1
Dimethyl phthalate	ND		ug/kg	200	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	160	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	160	--	1
Fluorene	ND		ug/kg	200	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	160	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	240	--	1
4-Chloroaniline	ND		ug/kg	200	--	1
Dibenzofuran	ND		ug/kg	200	--	1
2-Methylnaphthalene	ND		ug/kg	240	--	1
Acetophenone	ND		ug/kg	200	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	200	--	1
2,4-Dichlorophenol	ND		ug/kg	180	--	1
2,4-Dimethylphenol	ND		ug/kg	200	--	1
2-Nitrophenol	ND		ug/kg	430	--	1
4-Nitrophenol	ND		ug/kg	280	--	1
2,4-Dinitrophenol	ND		ug/kg	950	--	1
Pentachlorophenol	ND		ug/kg	400	--	1
Phenol	ND		ug/kg	200	--	1
2-Methylphenol	ND		ug/kg	200	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	290	--	1
2,4,5-Trichlorophenol	ND		ug/kg	200	--	1

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**

MCP Semivolatile Organics - Westborough Lab

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
2-Fluorophenol	62		30-130
Phenol-d6	71		30-130
Nitrobenzene-d5	78		30-130
2-Fluorobiphenyl	78		30-130
2,4,6-Tribromophenol	92		30-130
4-Terphenyl-d14	74		30-130

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	05/31/18 20:44
Analytical Date:	06/04/18 14:36		
Analyst:	ALS		
Percent Solids:	91%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	210	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	210	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	210	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	380	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	850	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**

MCP Semivolatile Organics - Westborough Lab

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
2-Fluorophenol	65		30-130
Phenol-d6	73		30-130
Nitrobenzene-d5	79		30-130
2-Fluorobiphenyl	79		30-130
2,4,6-Tribromophenol	97		30-130
4-Terphenyl-d14	82		30-130

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	05/31/18 20:44
Analytical Date:	06/04/18 15:02		
Analyst:	ALS		
Percent Solids:	90%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	910		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	330		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	280		ug/kg	140	--	1
Benzo(b)fluoranthene	620		ug/kg	110	--	1
Benzo(k)fluoranthene	140		ug/kg	110	--	1
Chrysene	450		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	230		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	240		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	240		ug/kg	140	--	1
Pyrene	730		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	870	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	61		30-130
Phenol-d6	69		30-130
Nitrobenzene-d5	73		30-130
2-Fluorobiphenyl	74		30-130
2,4,6-Tribromophenol	88		30-130
4-Terphenyl-d14	71		30-130

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/01/18 09:14
Analyst: ALS

Extraction Method: EPA 3546
Extraction Date: 05/31/18 02:51

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-04 Batch: WG1120892-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	100	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	100	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	100	--
Benzo(a)pyrene	ND		ug/kg	130	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/01/18 09:14
Analyst: ALS

Extraction Method: EPA 3546
Extraction Date: 05/31/18 02:51

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-04 Batch: WG1120892-1					
Benzo(b)fluoranthene	ND		ug/kg	100	--
Benzo(k)fluoranthene	ND		ug/kg	100	--
Chrysene	ND		ug/kg	100	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	100	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	100	--
Dibenzo(a,h)anthracene	ND		ug/kg	100	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	100	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	100	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	360	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	800	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	06/01/18 09:14	Extraction Date:	05/31/18 02:51
Analyst:	ALS		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-04 Batch: WG1120892-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	94		30-130
Phenol-d6	101		30-130
Nitrobenzene-d5	104		30-130
2-Fluorobiphenyl	92		30-130
2,4,6-Tribromophenol	91		30-130
4-Terphenyl-d14	95		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SOUTH

Project Number: 2604

Lab Number: L1819658

Report Date: 06/05/18

MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-04 Batch: WG1120892-2 WG1120892-3

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Acenaphthene	94		96		40-140	2		30
1,2,4-Trichlorobenzene	92		94		40-140	2		30
Hexachlorobenzene	91		93		40-140	2		30
Bis(2-chloroethyl)ether	93		96		40-140	3		30
2-Chloronaphthalene	97		99		40-140	2		30
1,2-Dichlorobenzene	89		87		40-140	2		30
1,3-Dichlorobenzene	87		86		40-140	1		30
1,4-Dichlorobenzene	87		87		40-140	0		30
3,3'-Dichlorobenzidine	73		80		40-140	9		30
2,4-Dinitrotoluene	124		125		40-140	1		30
2,6-Dinitrotoluene	124		128		40-140	3		30
Azobenzene	104		104		40-140	0		30
Fluoranthene	98		100		40-140	2		30
4-Bromophenyl phenyl ether	91		91		40-140	0		30
Bis(2-chloroisopropyl)ether	115		117		40-140	2		30
Bis(2-chloroethoxy)methane	97		100		40-140	3		30
Hexachlorobutadiene	88		89		40-140	1		30
Hexachloroethane	92		90		40-140	2		30
Isophorone	103		106		40-140	3		30
Naphthalene	92		92		40-140	0		30
Nitrobenzene	103		104		40-140	1		30
Bis(2-ethylhexyl)phthalate	117		123		40-140	5		30
Butyl benzyl phthalate	117		116		40-140	1		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-04 Batch: WG1120892-2 WG1120892-3								
Di-n-butylphthalate	110		113		40-140	3		30
Di-n-octylphthalate	120		124		40-140	3		30
Diethyl phthalate	105		106		40-140	1		30
Dimethyl phthalate	102		104		40-140	2		30
Benzo(a)anthracene	96		101		40-140	5		30
Benzo(a)pyrene	93		94		40-140	1		30
Benzo(b)fluoranthene	90		94		40-140	4		30
Benzo(k)fluoranthene	91		92		40-140	1		30
Chrysene	98		102		40-140	4		30
Acenaphthylene	104		106		40-140	2		30
Anthracene	101		103		40-140	2		30
Benzo(ghi)perylene	93		98		40-140	5		30
Fluorene	99		99		40-140	0		30
Phenanthrene	96		98		40-140	2		30
Dibenzo(a,h)anthracene	92		96		40-140	4		30
Indeno(1,2,3-cd)pyrene	92		96		40-140	4		30
Pyrene	99		100		40-140	1		30
Aniline	58		63		40-140	8		30
4-Chloroaniline	97		96		40-140	1		30
Dibenzofuran	96		96		40-140	0		30
2-Methylnaphthalene	97		99		40-140	2		30
Acetophenone	97		100		40-140	3		30
2,4,6-Trichlorophenol	102		106		30-130	4		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Parameter	***LCS %Recovery***	***Qual***	***LCSD %Recovery***	***Qual***	***%Recovery Limits***	***RPD***	***Qual***	***RPD Limits***
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-04 Batch: WG1120892-2 WG1120892-3								
2-Chlorophenol	98		98		30-130	0		30
2,4-Dichlorophenol	104		108		30-130	4		30
2,4-Dimethylphenol	103		106		30-130	3		30
2-Nitrophenol	115		120		30-130	4		30
4-Nitrophenol	**134**	Q	**134**	Q	30-130	0		30
2,4-Dinitrophenol	59		43		30-130	**31**	Q	30
Pentachlorophenol	99		97		30-130	2		30
Phenol	92		95		30-130	3		30
2-Methylphenol	102		104		30-130	2		30
3-Methylphenol/4-Methylphenol	109		114		30-130	4		30
2,4,5-Trichlorophenol	101		104		30-130	3		30

Surrogate	***LCS %Recovery***	***Qual***	***LCSD %Recovery***	***Qual***	***Acceptance Criteria***
2-Fluorophenol	92		93		30-130
Phenol-d6	98		100		30-130
Nitrobenzene-d5	102		104		30-130
2-Fluorobiphenyl	91		93		30-130
2,4,6-Tribromophenol	95		94		30-130
4-Terphenyl-d14	87		89		30-130

PETROLEUM HYDROCARBONS

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	05/31/18 12:17
Analytical Date:	06/01/18 12:14		
Analyst:	MEO		
Percent Solids:	88%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	36900	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	75		40-140

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	05/31/18 12:17
Analytical Date:	06/01/18 13:19		
Analyst:	MEO		
Percent Solids:	83%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	93600		ug/kg	39700	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	72		40-140

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	05/31/18 12:17
Analytical Date:	06/01/18 12:46		
Analyst:	MEO		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	35500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	79		40-140

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	05/31/18 12:17
Analytical Date:	06/01/18 13:52		
Analyst:	MEO		
Percent Solids:	90%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	72400		ug/kg	35000	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	78		40-140

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 06/01/18 08:02
Analyst: MEO

Extraction Method: EPA 3546
Extraction Date: 05/31/18 12:17

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-04 Batch: WG1121118-1					
TPH	ND		ug/kg	31500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	72		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604
Lab Number: L1819658
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-04 Batch: WG1121118-2								
TPH	76		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	70				40-140

PCBS

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	05/31/18 13:45
Analytical Date:	06/04/18 21:10	Cleanup Method:	EPA 3665A
Analyst:	WR	Cleanup Date:	06/01/18
Percent Solids:	88%	Cleanup Method:	EPA 3660B
		Cleanup Date:	06/01/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.1	--	1	A
Aroclor 1221	ND		ug/kg	37.1	--	1	A
Aroclor 1232	ND		ug/kg	37.1	--	1	A
Aroclor 1242	ND		ug/kg	37.1	--	1	A
Aroclor 1248	ND		ug/kg	37.1	--	1	A
Aroclor 1254	ND		ug/kg	37.1	--	1	A
Aroclor 1260	ND		ug/kg	37.1	--	1	B
Aroclor 1262	ND		ug/kg	37.1	--	1	A
Aroclor 1268	ND		ug/kg	37.1	--	1	A
PCBs, Total	ND		ug/kg	37.1	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	86		30-150	A
Decachlorobiphenyl	74		30-150	A
2,4,5,6-Tetrachloro-m-xylene	82		30-150	B
Decachlorobiphenyl	83		30-150	B

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	05/31/18 13:45
Analytical Date:	06/04/18 21:23	Cleanup Method:	EPA 3665A
Analyst:	KB	Cleanup Date:	06/01/18
Percent Solids:	83%	Cleanup Method:	EPA 3660B
		Cleanup Date:	06/01/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	39.6	--	1	A
Aroclor 1221	ND		ug/kg	39.6	--	1	A
Aroclor 1232	ND		ug/kg	39.6	--	1	A
Aroclor 1242	ND		ug/kg	39.6	--	1	A
Aroclor 1248	ND		ug/kg	39.6	--	1	A
Aroclor 1254	ND		ug/kg	39.6	--	1	A
Aroclor 1260	ND		ug/kg	39.6	--	1	A
Aroclor 1262	ND		ug/kg	39.6	--	1	A
Aroclor 1268	ND		ug/kg	39.6	--	1	A
PCBs, Total	ND		ug/kg	39.6	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		30-150	A
Decachlorobiphenyl	60		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		30-150	B
Decachlorobiphenyl	67		30-150	B

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	05/31/18 13:45
Analytical Date:	06/04/18 21:36	Cleanup Method:	EPA 3665A
Analyst:	KB	Cleanup Date:	06/01/18
Percent Solids:	91%	Cleanup Method:	EPA 3660B
		Cleanup Date:	06/01/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.1	--	1	A
Aroclor 1221	ND		ug/kg	36.1	--	1	A
Aroclor 1232	ND		ug/kg	36.1	--	1	A
Aroclor 1242	ND		ug/kg	36.1	--	1	A
Aroclor 1248	ND		ug/kg	36.1	--	1	A
Aroclor 1254	ND		ug/kg	36.1	--	1	A
Aroclor 1260	ND		ug/kg	36.1	--	1	A
Aroclor 1262	ND		ug/kg	36.1	--	1	A
Aroclor 1268	ND		ug/kg	36.1	--	1	A
PCBs, Total	ND		ug/kg	36.1	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		30-150	A
Decachlorobiphenyl	64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	76		30-150	B
Decachlorobiphenyl	69		30-150	B

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	05/31/18 13:45
Analytical Date:	06/04/18 21:49	Cleanup Method:	EPA 3665A
Analyst:	KB	Cleanup Date:	06/01/18
Percent Solids:	90%	Cleanup Method:	EPA 3660B
		Cleanup Date:	06/01/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.5	--	1	A
Aroclor 1221	ND		ug/kg	36.5	--	1	A
Aroclor 1232	ND		ug/kg	36.5	--	1	A
Aroclor 1242	ND		ug/kg	36.5	--	1	A
Aroclor 1248	ND		ug/kg	36.5	--	1	A
Aroclor 1254	ND		ug/kg	36.5	--	1	A
Aroclor 1260	ND		ug/kg	36.5	--	1	B
Aroclor 1262	ND		ug/kg	36.5	--	1	A
Aroclor 1268	ND		ug/kg	36.5	--	1	B
PCBs, Total	ND		ug/kg	36.5	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		30-150	A
Decachlorobiphenyl	61		30-150	A
2,4,5,6-Tetrachloro-m-xylene	79		30-150	B
Decachlorobiphenyl	67		30-150	B

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 06/04/18 23:33
Analyst: HT

Extraction Method: EPA 3546
Extraction Date: 05/31/18 13:45
Cleanup Method: EPA 3665A
Cleanup Date: 06/01/18
Cleanup Method: EPA 3660B
Cleanup Date: 06/01/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-04 Batch: WG1121164-1						
Aroclor 1016	ND		ug/kg	32.6	--	A
Aroclor 1221	ND		ug/kg	32.6	--	A
Aroclor 1232	ND		ug/kg	32.6	--	A
Aroclor 1242	ND		ug/kg	32.6	--	A
Aroclor 1248	ND		ug/kg	32.6	--	A
Aroclor 1254	ND		ug/kg	32.6	--	A
Aroclor 1260	ND		ug/kg	32.6	--	A
Aroclor 1262	ND		ug/kg	32.6	--	A
Aroclor 1268	ND		ug/kg	32.6	--	A
PCBs, Total	ND		ug/kg	32.6	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	92		30-150	A
Decachlorobiphenyl	75		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		30-150	B
Decachlorobiphenyl	80		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SOUTH
Lab Number: L1819658
Project Number: 2604
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-04 Batch: WG1121164-2 WG1121164-3									
Aroclor 1016	58		67		40-140	14		30	A
Aroclor 1260	48		55		40-140	14		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		88		30-150	A
Decachlorobiphenyl	59		67		30-150	A
2,4,5,6-Tetrachloro-m-xylene	73		84		30-150	B
Decachlorobiphenyl	71		74		30-150	B

METALS

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	48.6		mg/kg	0.435	--	1	05/31/18 05:00	05/31/18 12:02	EPA 3050B	97,6010C	LC
Cadmium, Total	ND		mg/kg	0.435	--	1	05/31/18 05:00	05/31/18 12:02	EPA 3050B	97,6010C	LC
Chromium, Total	34.1		mg/kg	0.435	--	1	05/31/18 05:00	05/31/18 12:02	EPA 3050B	97,6010C	LC
Lead, Total	52.9		mg/kg	2.17	--	1	05/31/18 05:00	05/31/18 12:02	EPA 3050B	97,6010C	LC
Mercury, Total	ND		mg/kg	0.071	--	1	06/01/18 08:00	06/01/18 11:35	EPA 7471B	97,7471B	BV

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	83%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	39.6		mg/kg	0.472	--	1	05/31/18 05:00	05/31/18 12:06	EPA 3050B	97,6010C	LC
Cadmium, Total	ND		mg/kg	0.472	--	1	05/31/18 05:00	05/31/18 12:06	EPA 3050B	97,6010C	LC
Chromium, Total	32.4		mg/kg	0.472	--	1	05/31/18 05:00	05/31/18 12:06	EPA 3050B	97,6010C	LC
Lead, Total	42.9		mg/kg	2.36	--	1	05/31/18 05:00	05/31/18 12:06	EPA 3050B	97,6010C	LC
Mercury, Total	0.100		mg/kg	0.076	--	1	06/01/18 08:00	06/01/18 11:37	EPA 7471B	97,7471B	BV

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

SAMPLE RESULTS

Lab ID:	L1819658-03	Date Collected:	05/29/18 15:00
Client ID:	SB-3	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	45.2		mg/kg	0.434	--	1	05/31/18 05:00	05/31/18 12:10	EPA 3050B	97,6010C	LC
Cadmium, Total	ND		mg/kg	0.434	--	1	05/31/18 05:00	05/31/18 12:10	EPA 3050B	97,6010C	LC
Chromium, Total	31.0		mg/kg	0.434	--	1	05/31/18 05:00	05/31/18 12:10	EPA 3050B	97,6010C	LC
Lead, Total	13.7		mg/kg	2.17	--	1	05/31/18 05:00	05/31/18 12:10	EPA 3050B	97,6010C	LC
Mercury, Total	ND		mg/kg	0.069	--	1	06/01/18 08:00	06/01/18 11:39	EPA 7471B	97,7471B	BV

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

SAMPLE RESULTS

Lab ID:	L1819658-04	Date Collected:	05/29/18 15:09
Client ID:	SB-4	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	34.0		mg/kg	0.435	--	1	05/31/18 05:00	05/31/18 17:22	EPA 3050B	97,6010C	AB
Cadmium, Total	ND		mg/kg	0.435	--	1	05/31/18 05:00	05/31/18 17:22	EPA 3050B	97,6010C	AB
Chromium, Total	31.3		mg/kg	0.435	--	1	05/31/18 05:00	05/31/18 17:22	EPA 3050B	97,6010C	AB
Lead, Total	14.4		mg/kg	2.17	--	1	05/31/18 05:00	05/31/18 17:22	EPA 3050B	97,6010C	AB
Mercury, Total	0.159		mg/kg	0.070	--	1	06/01/18 08:00	06/01/18 11:41	EPA 7471B	97,7471B	BV

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-04 Batch: WG1120903-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	05/31/18 05:00	05/31/18 09:48	97,6010C	LC
Cadmium, Total	ND		mg/kg	0.400	--	1	05/31/18 05:00	05/31/18 09:48	97,6010C	LC
Chromium, Total	ND		mg/kg	0.400	--	1	05/31/18 05:00	05/31/18 09:48	97,6010C	LC
Lead, Total	ND		mg/kg	2.00	--	1	05/31/18 05:00	05/31/18 09:48	97,6010C	LC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-04 Batch: WG1121339-1										
Mercury, Total	ND		mg/kg	0.083	--	1	06/01/18 08:00	06/01/18 11:00	97,7471B	BV

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG1120903-2 WG1120903-3 SRM Lot Number: D098-540								
Arsenic, Total	98		96		83-117	2		30
Cadmium, Total	88		86		82-117	2		30
Chromium, Total	96		94		83-119	2		30
Lead, Total	91		88		82-117	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG1121339-2 WG1121339-3 SRM Lot Number: D098-540								
Mercury, Total	97		115		50-149	17		30

INORGANICS
&
MISCELLANEOUS

Project Name:	WORC SOUTH	**Lab Number:**	L1819658
Project Number:	2604	**Report Date:**	06/05/18

SAMPLE RESULTS

Lab ID:	L1819658-01	Date Collected:	05/29/18 14:20
Client ID:	SB-1	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	05/30/18 03:20	1,9050A	UN
Solids, Total	88.4		%	0.100	NA	1	-	05/29/18 23:35	121,2540G	FN

SAMPLE RESULTS

Lab ID:	L1819658-02	Date Collected:	05/29/18 14:30
Client ID:	SB-2	Date Received:	05/29/18
Sample Location:	SCHOOL	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	05/30/18 03:20	1,9050A	UN
Solids, Total	82.5		%	0.100	NA	1	-	05/29/18 23:35	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1819658-03
Client ID: SB-3
Sample Location: SCHOOL

Date Collected: 05/29/18 15:00
Date Received: 05/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	05/30/18 03:20	1,9050A	UN
Solids, Total	91.4		%	0.100	NA	1	-	05/29/18 23:35	121,2540G	FN

SAMPLE RESULTS

Lab ID: L1819658-04
Client ID: SB-4
Sample Location: SCHOOL
Date Collected: 05/29/18 15:09
Date Received: 05/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	05/30/18 03:20	1,9050A	UN
Solids, Total	90.1		%	0.100	NA	1	-	05/29/18 23:35	121,2540G	FN

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SOUTH
Project Number: 2604

Lab Number: L1819658
Report Date: 06/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1120529-1								
Specific Conductance	99		-		99-101	-		

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1819658-01A	Vial MeOH preserved	A	NA		20.0	Y	Absent		MCP-8260H-10(14)
L1819658-01B	Plastic 2oz unpreserved for TS	A	NA		20.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1819658-01C	Glass 250ml/8oz unpreserved	A	NA		20.0	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)
L1819658-02A	Vial MeOH preserved	A	NA		20.0	Y	Absent		MCP-8260H-10(14)
L1819658-02B	Plastic 2oz unpreserved for TS	A	NA		20.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1819658-02C	Glass 250ml/8oz unpreserved	A	NA		20.0	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)
L1819658-03A	Vial MeOH preserved	A	NA		20.0	Y	Absent		MCP-8260H-10(14)
L1819658-03B	Plastic 2oz unpreserved for TS	A	NA		20.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1819658-03C	Glass 250ml/8oz unpreserved	A	NA		20.0	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)
L1819658-04A	Vial MeOH preserved	A	NA		20.0	Y	Absent		MCP-8260H-10(14)
L1819658-04B	Plastic 2oz unpreserved for TS	A	NA		20.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-PB-6010T-10(180)
L1819658-04C	Glass 250ml/8oz unpreserved	A	NA		20.0	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),COND-9050(28)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Alpha Analytical, Inc. ID No.:**17873**
Facility: **Company-wide** Revision 11
Department: **Quality Assurance** Published Date: 1/8/2018 4:15:49 PM
Title: **Certificate/Approval Program Summary** Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 5/29/18

ALPHA Job #: L1819658

ALPHA ANALYTICAL
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: LORD ASSOC. Inc.
Address: 1506 PROV Highway
Norwood
Phone: 781-255-5554
Email: ATella@Lordenv.com

Additional Project Information:

Project Information

Project Name: WORC South School
Project Location: School
Project #: 2604
Project Manager: RALPH
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

☑ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program ____________ Criteria ____________

ANALYSIS

SAMPLE INFO

Filtration
☐ Field
☐ Lab to do

Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	Comm-97						Sample Comments	TOTAL # BOTTLES
19658-01	SB-1	5/29	2:20	S	KT									X							3
02	SB-2	5/29	2:30	↓	↓									X							3
03	SB-3	5/29	3:00											X							3
04	SB-4	5/29	3:09											X							3

Container Type									V+A					
Preservative									F A					

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
P. Tella	5/29/18 4:17		5-29-18 1627

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
VOLATILES

Client	: Lord Associates, Inc.	**Lab Number**	: L1819658
Project Name	: WORC SOUTH	**Project Number**	: 2604
Lab Sample ID	: WG1121503-5	**Lab File ID**	: V17180601A05
Instrument ID	: VOA117		
Matrix	: SOIL	**Analysis Date**	: 06/01/18 09:19

Client Sample No.	Lab Sample ID	Analysis Date
WG1121503-3LCS	WG1121503-3	06/01/18 07:34
WG1121503-4LCSD	WG1121503-4	06/01/18 08:26
SB-1	L1819658-01	06/01/18 10:37
SB-2	L1819658-02	06/01/18 11:03
SB-3	L1819658-03	06/01/18 11:30
SB-4	L1819658-04	06/01/18 11:56

Continuing Calibration
Form 7

Client	: Lord Associates, Inc.	**Lab Number**	: L1819658
Project Name	: WORC SOUTH	**Project Number**	: 2604
Instrument ID	: VOA117	**Calibration Date**	: 06/01/18 07:34
Lab File ID	: V17180601A01	**Init. Calib. Date(s)**	: 05/15/18 05/15/18
Sample No	: WG1121503-2	**Init. Calib. Times**	: 14:46 18:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	88	0
Dichlorodifluoromethane	0.33	0.251	-	23.9*	20	65	0
Chloromethane	0.628	0.456	-	27.4*	20	64	0
Vinyl chloride	0.435	0.479	-	-10.1	20	95	0
Bromomethane	0.181	0.266	-	-47*	20	144	0
Chloroethane	0.225	0.334	-	-48.4*	20	130	0
Trichlorofluoromethane	0.417	0.557	-	-33.6*	20	115	0
Ethyl ether	0.147	0.166	-	-12.9	20	101	0
1,1-Dichloroethene	0.266	0.221	-	16.9	20	72	0
Carbon disulfide	0.939	0.729	-	22.4*	20	72	0
Freon-113	0.262	0.217	-	17.2	20	72	0
Acrolein	0.054	0.044	-	18.5	20	73	0
Methylene chloride	0.327	0.292	-	10.7	20	80	0
Acetone	20	19.761	-	1.2	20	87	-.01
trans-1,2-Dichloroethene	0.314	0.274	-	12.7	20	76	0
Methyl acetate	0.215	0.162	-	24.7*	20	68	-.01
Methyl tert-butyl ether	0.748	0.701	-	6.3	20	81	0
tert-Butyl alcohol	0.031	0.025	-	19.4	20	74	-.01
Diisopropyl ether	1.459	1.221	-	16.3	20	70	0
1,1-Dichloroethane	0.702	0.646	-	8	20	80	0
Halothane	0.227	0.191	-	15.9	20	72	0
Acrylonitrile	0.101	0.088	-	12.9	20	73	-.01
Ethyl tert-butyl ether	1.184	1.07	-	9.6	20	77	0
Vinyl acetate	0.759	0.683	-	10	20	76	0
cis-1,2-Dichloroethene	0.338	0.313	-	7.4	20	79	0
2,2-Dichloropropane	0.497	0.474	-	4.6	20	84	0
Bromochloromethane	0.128	0.122	-	4.7	20	80	0
Cyclohexane	0.747	0.589	-	21.2*	20	67	0
Chloroform	0.562	0.557	-	0.9	20	87	0
Ethyl acetate	0.31	0.258	-	16.8	20	76	0
Carbon tetrachloride	0.426	0.378	-	11.3	20	76	0
Tetrahydrofuran	0.092	0.075	-	18.5	20	70	0
Dibromofluoromethane	0.237	0.239	-	-0.8	20	88	0
1,1,1-Trichloroethane	0.494	0.459	-	7.1	20	80	-.01
2-Butanone	0.134	0.104	-	22.4*	20	70	0
1,1-Dichloropropene	0.427	0.406	-	4.9	20	82	0
Benzene	1.294	1.219	-	5.8	20	82	0
tert-Amyl methyl ether	0.828	0.797	-	3.7	20	84	0
1,2-Dichloroethane-d4	0.264	0.279	-	-5.7	20	93	0
1,2-Dichloroethane	0.435	0.446	-	-2.5	20	90	-.01
Methyl cyclohexane	0.533	0.477	-	10.5	20	76	-.01
Trichloroethene	0.327	0.309	-	5.5	20	82	0
Dibromomethane	0.158	0.161	-	-1.9	20	89	0
1,2-Dichloropropane	0.389	0.362	-	6.9	20	80	0
2-Chloroethyl vinyl ether	0.167	0.159	-	4.8	20	81	-.01

* Value outside of QC limits.

Continuing Calibration
Form 7

Client	: Lord Associates, Inc.	**Lab Number**	: L1819658	
Project Name	: WORC SOUTH	**Project Number**	: 2604	
Instrument ID	: VOA117	**Calibration Date**	: 06/01/18 07:34	
Lab File ID	: V17180601A01	**Init. Calib. Date(s)**	: 05/15/18	05/15/18
Sample No	: WG1121503-2	**Init. Calib. Times**	: 14:46	18:16
Channel	:			

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Bromodichloromethane	0.422	0.415	-	1.7	20	86	0
1,4-Dioxane	1000	803.635	-	19.6	20	75	0
cis-1,3-Dichloropropene	0.507	0.494	-	2.6	20	83	-.01
Chlorobenzene-d5	1	1	-	0	20	95	0
Toluene-d8	1.317	1.279	-	2.9	20	91	0
Toluene	1.097	0.944	-	13.9	20	82	0
4-Methyl-2-pentanone	0.147	0.115	-	21.8*	20	71	0
Tetrachloroethene	0.406	0.317	-	21.9*	20	71	0
trans-1,3-Dichloropropene	0.567	0.529	-	6.7	20	86	0
Ethyl methacrylate	0.425	0.357	-	16	20	78	0
1,1,2-Trichloroethane	0.262	0.242	-	7.6	20	85	-.01
Chlorodibromomethane	0.355	0.306	-	13.8	20	78	0
1,3-Dichloropropane	0.556	0.512	-	7.9	20	85	-.01
1,2-Dibromoethane	0.284	0.254	-	10.6	20	82	0
2-Hexanone	0.276	0.222	-	19.6	20	77	-.01
Chlorobenzene	1.137	0.979	-	13.9	20	80	0
Ethylbenzene	2.075	1.848	-	10.9	20	83	0
1,1,1,2-Tetrachloroethane	0.387	0.332	-	14.2	20	79	0
p/m Xylene	0.763	0.68	-	10.9	20	81	0
o Xylene	0.741	0.666	-	10.1	20	81	0
Styrene	1.205	1.079	-	10.5	20	81	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	99	0
Bromoform	0.423	0.338	-	20.1*	20	79	-.01
Isopropylbenzene	3.988	3.379	-	15.3	20	82	0
4-Bromofluorobenzene	1.05	1.013	-	3.5	20	97	0
Bromobenzene	0.888	0.703	-	20.8*	20	78	0
n-Propylbenzene	4.891	4.327	-	11.5	20	86	0
1,4-Dichlorobutane	1.605	1.281	-	20.2*	20	78	0
1,1,2,2-Tetrachloroethane	0.782	0.707	-	9.6	20	89	0
4-Ethyltoluene	4.07	3.455	-	15.1	20	83	0
2-Chlorotoluene	2.918	2.429	-	16.8	20	82	0
1,3,5-Trimethylbenzene	3.38	2.904	-	14.1	20	83	0
1,2,3-Trichloropropane	0.616	0.538	-	12.7	20	87	0
trans-1,4-Dichloro-2-buten	0.294	0.269	-	8.5	20	87	0
4-Chlorotoluene	3.083	2.598	-	15.7	20	84	0
tert-Butylbenzene	2.807	2.305	-	17.9	20	80	0
1,2,4-Trimethylbenzene	3.436	2.942	-	14.4	20	84	0
sec-Butylbenzene	4.327	3.682	-	14.9	20	83	0
p-Isopropyltoluene	3.571	3.01	-	15.7	20	82	0
1,3-Dichlorobenzene	1.773	1.492	-	15.8	20	82	0
1,4-Dichlorobenzene	1.761	1.483	-	15.8	20	84	0
p-Diethylbenzene	2.22	1.848	-	16.8	20	81	0
n-Butylbenzene	3.616	3.294	-	8.9	20	89	0
1,2-Dichlorobenzene	1.59	1.343	-	15.5	20	83	0
1,2,4,5-Tetramethylbenzene	3.509	2.951	-	15.9	20	81	0

* Value outside of QC limits.

Continuing Calibration
Form 7

Client	: Lord Associates, Inc.	**Lab Number**	: L1819658
Project Name	: WORC SOUTH	**Project Number**	: 2604
Instrument ID	: VOA117	**Calibration Date**	: 06/01/18 07:34
Lab File ID	: V17180601A01	**Init. Calib. Date(s)**	: 05/15/18 05/15/18
Sample No	: WG1121503-2	**Init. Calib. Times**	: 14:46 18:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dibromo-3-chloropropan	0.104	0.078	-	25*	20	71	0
1,3,5-Trichlorobenzene	1.335	1.058	-	20.7*	20	78	0
Hexachlorobutadiene	0.643	0.427	-	33.6*	20	66	0
1,2,4-Trichlorobenzene	1.146	0.911	-	20.5*	20	78	0
Naphthalene	2.337	1.871	-	19.9	20	80	0
1,2,3-Trichlorobenzene	1.019	0.806	-	20.9*	20	77	0

* Value outside of QC limits.

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Lord Associates, Inc.
Environmental Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

July 16, 2018

J. Rosati
T & M Equipment Corporation
177 Rocus Street
Springfield, MA. 01104

RE: Disposal Soil Sample Results: Athletic Field
Worcester South High School
Worcester, MA.

Dear Mr. Rosati,

Pursuant to your request, Lord Associates, Inc. (LAI) has prepared the following summary of soil sampling results from the Worcester South High School project in Worcester, Massachusetts collected on July 6, 2018. The purpose of this soil sampling was to pre-characterize the soil from the athletic field that may be excavated during development of the property for a new school for off-site disposal.

Method
The locations of the samples were selected by David Fontaine. A copy of the sample location plan is attached.

The areas sampled were excavated to an approximate depth of 2-3 feet below surface grade with a backhoe. Samples were placed in laboratory prepared and preserved containers and transported to a state-certified laboratory (Alpha Analytical) in Westboro, Massachusetts for disposal characterization parameters in accordance with MA Comm-97-001 Policy: Reuse & Disposal of Contaminated Soil at Massachusetts landfills plus the MCP 14 metals that same day.

Results

The results of the testing were compared to Massachusetts RCS-1 Reportable Concentrations. As shown on Table 1, arsenic was detected at each location greater than the RCS-1 standards, ranging from 26.4 to 41.5 mg/kg, with an average concentration of 32.8 mg/kg. These concentrations are entirely consistent with previous findings considered to be of natural origin and exempt from MADEP notification requirements.

There were no standards exceeded for other metals detected or volatile, semi-volatile organic compounds, PCBs, or total petroleum hydrocarbons detected above the laboratory reporting limits. A copy of the original laboratory report is attached.

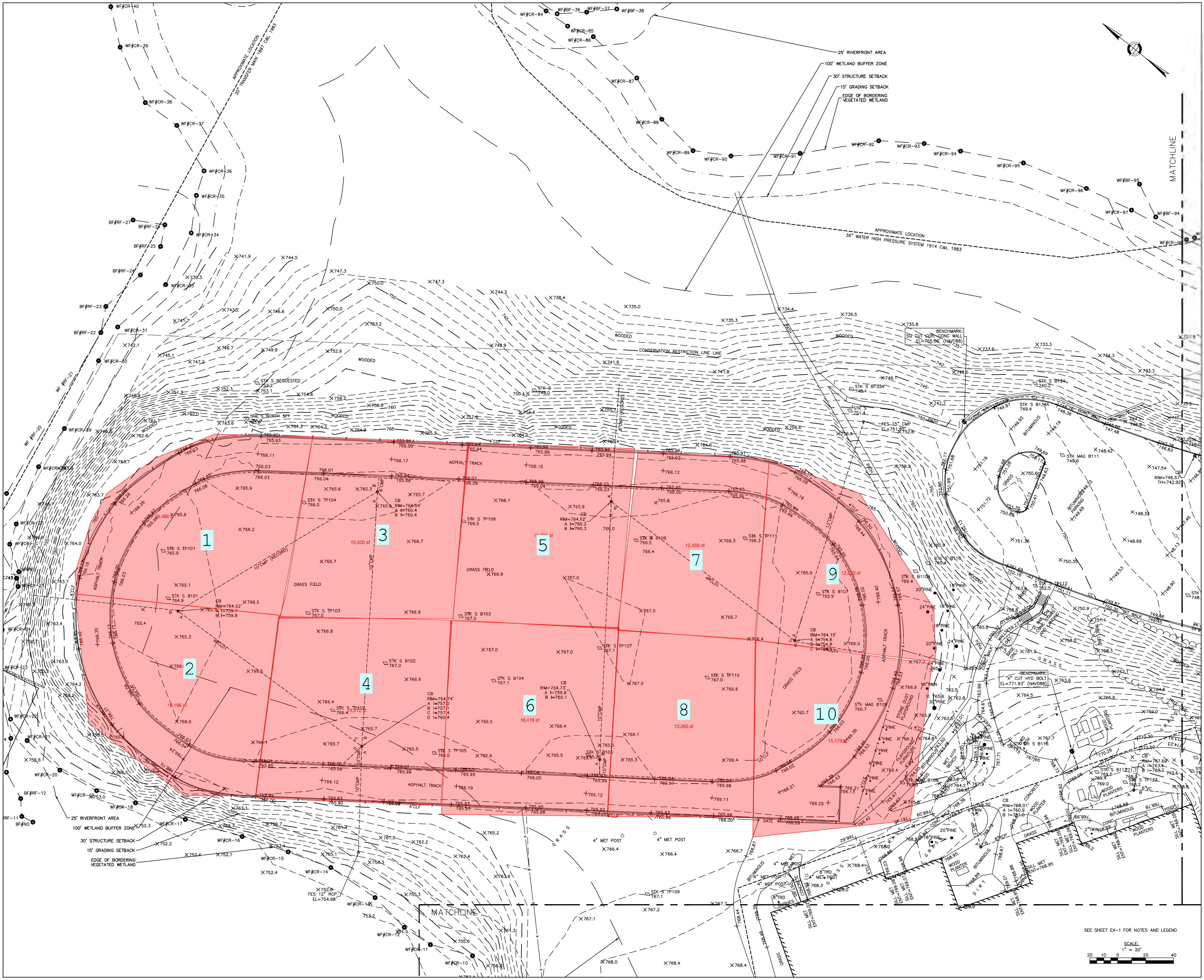
Please contact me if you have any questions.

Sincerely,
LORD ASSOCIATES, INC.

Ralph J. Tella

Ralph J. Tella, LSP, CHMM
President and Senior Project Manager

Attached: Site Sampling Plan
Table 1 Soil Results Summary
Copy of Laboratory Results



SEE SHEET EX-1 FOR NOTES AND LEGEND

SCALE:
1" = 20'

20 10 0 20 40

LAMOUREUX PAGANO ASSOCIATES ARCHITECTS
108 GROVE STREET SUITE 300
WORCESTER MASSACHUSETTS 01605

MEMBER OF
THE AMERICAN INSTITUTE OF ARCHITECTS

CONSULTANT

Nitsch Engineering

OWNER

Worcester Public Schools

Worcester, MA

PROJECT

DESIGN DEVELOPMENT

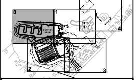
South High
Community School

170 Apricot Street, Worcester, MA 01603

TITLE

EXISTING
CONDITIONS
PLAN

Key Plan



REVISIONS

No.	Description	Date

FILE: 11677cex

DWN. BY: ER
JOB NO: #1611

CKD. BY: JEG
SCALE: 1"=20'

DATE: May 11, 2018

EX2.0

Nitsch Project #11677

Sample Results Comparison with Reportable Concentrations RCS-1 Criteria.

CLIENT SAMPLE ID				A-1		A-2		A-3		A-4		A-5		A-6		A-7		A-8		A-9		A-10	
SAMPLING DATE				06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18		06-JUL-18	
LAB SAMPLE ID				L1825765-01		L1825765-02		L1825765-03		L1825765-04		L1825765-05		L1825765-06		L1825765-07		L1825765-08		L1825765-09		L1825765-10	
	CAS Number	RCS-1-14	Units		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual
General Chemistry																							
Specific Conductance @ 25 C	---		umhos/cm	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Solids, Total	---		%	86.2		85.2		88		92.6		87.2		89.4		91.4		91.6		92		94.3	
MCP Total Metals																							
Antimony, Total	7440-36-0	20	mg/kg	2.26	U	2.21	U	2.13	U	2.1	U	2.18	U	2.13	U	2.1	U	2.09	U	2.04	U	2	U
Arsenic, Total	7440-38-2	20	mg/kg	37.3		40.5		28.6		34.7		27.9		32		31		26.4		28.5		41.5	
Barium, Total	7440-39-3	1000	mg/kg	43		51.8		37.7		35.9		83.5		40.9		42.4		53.3		45.4		37.2	
Beryllium, Total	7440-41-7	90	mg/kg	0.817		1.22		0.656		0.742		0.722		0.892		1.05		0.754		0.917		0.759	
Cadmium, Total	7440-43-9	70	mg/kg	0.451	U	0.442	U	0.426	U	0.42	U	0.435	U	0.427	U	0.421	U	0.419	U	0.408	U	0.399	U
Chromium, Total	7440-47-3	100	mg/kg	31.4		32.4		25.6		29.8		46.1		32.6		24.8		33.3		26.2		24.8	
Lead, Total	7439-92-1	200	mg/kg	7.18		7.23		6.97		9.16		4.01		4.06		3.29		3.1		3.92		3.69	
Mercury, Total	7439-97-6	20	mg/kg	0.073	U	0.074	U	0.071	U	0.069	U	0.072	U	0.071	U	0.069	U	0.068	U	0.068	U	0.067	U
Nickel, Total	7440-02-0	600	mg/kg	17.8		19		14.6		15.4		26.8		18.6		15.8		15.6		15.9		16.7	
Selenium, Total	7782-49-2	400	mg/kg	2.26	U	2.21	U	2.13	U	2.1	U	2.18	U	2.13	U	2.1	U	2.09	U	2.04	U	2	U
Silver, Total	7440-22-4	100	mg/kg	0.451	U	0.442	U	0.426	U	0.42	U	0.435	U	0.427	U	0.421	U	0.419	U	0.408	U	0.399	U
Thallium, Total	7440-28-0	8	mg/kg	2.26	U	2.21	U	2.13	U	2.1	U	2.18	U	2.13	U	2.1	U	2.09	U	2.04	U	2	U
Vanadium, Total	7440-62-2	400	mg/kg	23.4		23.4		19.8		23.7		38.2		22.4		16.5		18.3		17.7		16.4	
Zinc, Total	7440-66-6	1000	mg/kg	26.9		26.8		23.4		26.8		34.8		21.8		18.8		20.7		20.2		21.6	
MCP Volatile Organics by 5035 High																							
1,1,1,2-Tetrachloroethane	630-20-6	0.1	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
1,1,1-Trichloroethane	71-55-6	30	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
1,1,2,2-Tetrachloroethane	79-34-5	0.005	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
1,1,2-Trichloroethane	79-00-5	0.1	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,1-Dichloroethane	75-34-3	0.4	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,1-Dichloroethene	75-35-4	3	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,1-Dichloropropene	563-58-6		mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
1,2,3-Trichlorobenzene	87-61-6		mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,2,3-Trichloropropane	96-18-4	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,2,4-Trimethylbenzene	95-63-6	1000	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,2-Dibromo-3-chloropropane	96-12-8	10	mg/kg	0.12	U	0.19	U	0.13	U	0.099	U	0.1	U	0.11	U	0.12	U	0.086	U	0.091	U	0.1	U
1,2-Dibromoethane	106-93-4	0.1	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,2-Dichloroethane	107-06-2	0.1	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,2-Dichloroethene, Total	540-59-0		mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,2-Dichloropropane	78-87-5	0.1	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
1,3,5-Trimethylbenzene	108-67-8	10	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,3-Dichlorobenzene	541-73-1	3	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,3-Dichloropropane	142-28-9	500	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,3-Dichloropropene, Total	542-75-6	0.01	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
1,4-Dichlorobenzene	106-46-7	0.7	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
1,4-Dioxane	123-91-1	0.2	mg/kg	4.1	U	6.2	U	4.2	U	3.3	U	3.4	U	3.8	U	4.1	U	2.9	U	3	U	3.3	U
2,2-Dichloropropane	594-20-7		mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
2-Hexanone	591-78-6	100	mg/kg	0.41	U	0.62	U	0.42	U	0.33	U	0.34	U	0.38	U	0.41	U	0.29	U	0.3	U	0.33	U
Acetone	67-64-1	6	mg/kg	0.41	U	0.62	U	0.42	U	0.33	U	0.34	U	0.38	U	0.41	U	0.29	U	0.3	U	0.33	U
Benzene	71-43-2	2	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
Bromobenzene	108-86-1	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Bromochloromethane	74-97-5		mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Bromodichloromethane	75-27-4	0.1	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
Bromoform	75-25-2	0.1	mg/kg	0.16	U	0.25	U	0.17	U	0.13	U	0.13	U	0.15	U	0.16	U	0.11	U	0.12	U	0.13	U
Bromomethane	74-83-9	0.5	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Carbon disulfide	75-15-0	100	mg/kg	0.41	U	0.62	U	0.42	U	0.33	U	0.34	U	0.38	U	0.41	U	0.29	U	0.3	U	0.33	U
Carbon tetrachloride	56-23-5	5	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Chlorobenzene	108-90-7	1	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
Chloroethane	75-00-3	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Chloroform	67-66-3	0.2	mg/kg	0.061	U	0.093	U	0.063	U	0.05	U	0.05	U	0.057	U	0.062	U	0.043	U	0.045	U	0.05	U
Chloromethane	74-87-3	100	mg/kg	0.16	U	0.25	U	0.17	U	0.13	U	0.13	U	0.15	U	0.16	U	0.11	U	0.12	U	0.13	U
cis-1,2-Dichloroethene	156-59-2	0.1	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
cis-1,3-Dichloropropene	10061-01-5	0.01	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
Dibromochloromethane	124-48-1	0.005	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Dibromomethane	74-95-3	500	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Dichlorodifluoromethane	75-71-8	1000	mg/kg	0.41	U	0.62	U	0.42	U	0.33	U	0.34	U	0.38	U	0.41	U	0.29	U	0.3	U	0.33	U
Diethyl ether	60-29-7	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Diisopropyl Ether	108-20-3	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Ethyl-Tert-Butyl-Ether	637-92-3		mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Ethylbenzene	100-41-4	40	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U

Hexachlorobutadiene	87-68-3	30	mg/kg	0.16	U	0.25	U	0.17	U	0.13	U	0.13	U	0.15	U	0.16	U	0.11	U	0.12	U	0.13	U
Isopropylbenzene	98-82-8	1000	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Methyl ethyl ketone	78-93-3	4	mg/kg	0.41	U	0.62	U	0.42	U	0.33	U	0.34	U	0.38	U	0.41	U	0.29	U	0.3	U	0.33	U
Methyl isobutyl ketone	108-10-1	0.4	mg/kg	0.41	U	0.62	U	0.42	U	0.33	U	0.34	U	0.38	U	0.41	U	0.29	U	0.3	U	0.33	U
Methyl tert butyl ether	1634-04-4	0.1	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Methylene chloride	75-09-2	0.1	mg/kg	0.2	U	0.31	U	0.21	U	0.16	U	0.17	U	0.19	U	0.21	U	0.14	U	0.15	U	0.17	U
n-Butylbenzene	104-51-8		mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
n-Propylbenzene	103-65-1	100	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Naphthalene	91-20-3	4	mg/kg	0.16	U	0.25	U	0.17	U	0.13	U	0.13	U	0.15	U	0.16	U	0.11	U	0.12	U	0.13	U
o-Chlorotoluene	95-49-8	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
o-Xylene	95-47-6	100	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
p-Chlorotoluene	106-43-4		mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
p-Isopropyltoluene	99-87-6	100	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
p/m-Xylene	179601-23-1	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
sec-Butylbenzene	135-98-8		mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Styrene	100-42-5	3	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
tert-Butylbenzene	98-06-6	100	mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Tertiary-Amyl Methyl Ether	994-05-8		mg/kg	0.082	U	0.12	U	0.084	U	0.066	U	0.067	U	0.076	U	0.083	U	0.057	U	0.061	U	0.067	U
Tetrachloroethene	127-18-4	1	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
Tetrahydrofuran	109-99-9	500	mg/kg	0.16	U	0.25	U	0.17	U	0.13	U	0.13	U	0.15	U	0.16	U	0.11	U	0.12	U	0.13	U
Toluene	108-88-3	30	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
trans-1,2-Dichloroethene	156-60-5	1	mg/kg	0.061	U	0.093	U	0.063	U	0.05	U	0.05	U	0.057	U	0.062	U	0.043	U	0.045	U	0.05	U
trans-1,3-Dichloropropene	10061-02-6	0.01	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Trichloroethene	79-01-6	0.3	mg/kg	0.02	U	0.031	U	0.021	U	0.016	U	0.017	U	0.019	U	0.021	U	0.014	U	0.015	U	0.017	U
Trichlorofluoromethane	75-69-4	1000	mg/kg	0.16	U	0.25	U	0.17	U	0.13	U	0.13	U	0.15	U	0.16	U	0.11	U	0.12	U	0.13	U
Vinyl chloride	75-01-4	0.7	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
Xylenes, Total	1330-20-7	100	mg/kg	0.041	U	0.062	U	0.042	U	0.033	U	0.034	U	0.038	U	0.041	U	0.029	U	0.03	U	0.033	U
MCP Semivolatile Organics																							
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
1,3-Dichlorobenzene	541-73-1	3	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
1,4-Dichlorobenzene	106-46-7	0.7	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2,4,5-Trichlorophenol	95-95-4	4	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2,4,6-Trichlorophenol	88-06-2	0.7	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
2,4-Dichlorophenol	120-83-2	0.7	mg/kg	0.17	U	0.18	U	0.17	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
2,4-Dimethylphenol	105-67-9	0.7	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2,4-Dinitrophenol	51-28-5	3	mg/kg	0.92	U	0.93	U	0.9	U	0.86	U	0.9	U	0.88	U	0.86	U	0.86	U	0.86	U	0.84	U
2,4-Dinitrotoluene	121-14-2	0.7	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2,6-Dinitrotoluene	606-20-2	100	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2-Chloronaphthalene	91-58-7	1000	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2-Chlorophenol	95-57-8	0.7	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2-Methylnaphthalene	91-57-6	0.7	mg/kg	0.23	U	0.23	U	0.23	U	0.21	U	0.23	U	0.22	U	0.22	U	0.22	U	0.22	U	0.21	U
2-Methylphenol	95-48-7	500	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
2-Nitrophenol	88-75-5	100	mg/kg	0.41	U	0.42	U	0.41	U	0.39	U	0.41	U	0.4	U	0.39	U	0.39	U	0.39	U	0.38	U
3,3'-Dichlorobenzidine	91-94-1	3	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
3-Methylphenol/4-Methylphenol	108-39-4	500	mg/kg	0.28	U	0.28	U	0.27	U	0.26	U	0.27	U	0.26	U	0.26	U	0.26	U	0.26	U	0.25	U
4-Bromophenyl phenyl ether	101-55-3	100	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
4-Chloroaniline	106-47-8	1	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
4-Nitrophenol	100-02-7	100	mg/kg	0.27	U	0.27	U	0.26	U	0.25	U	0.26	U	0.26	U	0.25	U	0.25	U	0.25	U	0.24	U
Acenaphthene	83-32-9	4	mg/kg	0.15	U	0.16	U	0.15	U	0.14	U	0.15	U	0.15	U	0.14	U	0.14	U	0.14	U	0.14	U
Acenaphthylene	208-96-8	1	mg/kg	0.15	U	0.16	U	0.15	U	0.14	U	0.15	U	0.15	U	0.14	U	0.14	U	0.14	U	0.14	U
Acetophenone	98-86-2	1000	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Aniline	62-53-3	1000	mg/kg	0.23	U	0.23	U	0.23	U	0.21	U	0.23	U	0.22	U	0.22	U	0.22	U	0.22	U	0.21	U
Anthracene	120-12-7	1000	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Azobenzene	103-33-3	50	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Benzo(a)anthracene	56-55-3	7	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Benzo(a)pyrene	50-32-8	2	mg/kg	0.15	U	0.16	U	0.15	U	0.14	U	0.15	U	0.15	U	0.14	U	0.14	U	0.14	U	0.14	U
Benzo(b)fluoranthene	205-99-2	7	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Benzo(ghi)perylene	191-24-2	1000	mg/kg	0.15	U	0.16	U	0.15	U	0.14	U	0.15	U	0.15	U	0.14	U	0.14	U	0.14	U	0.14	U
Benzo(k)fluoranthene	207-08-9	70	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Bis(2-chloroethoxy)methane	111-91-1	500	mg/kg	0.21	U	0.21	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
Bis(2-chloroethyl)ether	111-44-4	0.7	mg/kg	0.17	U	0.18	U	0.17	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Bis(2-chloroisopropyl)ether	108-60-1	0.7	mg/kg	0.23	U	0.23	U	0.23	U	0.21	U	0.23	U	0.22	U	0.22	U	0.22	U	0.22	U	0.21	U
Bis(2-ethylhexyl)phthalate	117-81-7	90	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Butyl benzyl phthalate	85-68-7	100	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Chrysene	218-01-9	70	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Di-n-butylphthalate	84-74-2	50	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Di-n-octylphthalate	117-84-0	1000	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Dibenzo(a,h)anthracene	53-70-3	0.7	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Dibenzofuran	132-64-9	100	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Diethyl phthalate	84-66-2	10	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Dimethyl phthalate	131-11-3	0.7	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Fluoranthene	206-44-0	1000	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Fluorene	86-73-7	1000	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Hexachlorobenzene	118-74-1	0.7	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Hexachlorobutadiene	87-68-3	30	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U

Hexachloroethane	67-72-1	0.7	mg/kg	0.15	U	0.16	U	0.15	U	0.14	U	0.15	U	0.15	U	0.14	U	0.14	U	0.14	U	0.14	U
Indeno(1,2,3-cd)pyrene	193-39-5	7	mg/kg	0.15	U	0.16	U	0.15	U	0.14	U	0.15	U	0.15	U	0.14	U	0.14	U	0.14	U	0.14	U
Isophorone	78-59-1	100	mg/kg	0.17	U	0.18	U	0.17	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Naphthalene	91-20-3	4	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Nitrobenzene	98-95-3	500	mg/kg	0.17	U	0.18	U	0.17	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Pentachlorophenol	87-86-5	3	mg/kg	0.38	U	0.39	U	0.38	U	0.36	U	0.38	U	0.37	U	0.36	U	0.36	U	0.36	U	0.35	U
Phenanthrene	85-01-8	10	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
Phenol	108-95-2	1	mg/kg	0.19	U	0.19	U	0.19	U	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.17	U
Pyrene	129-00-0	1000	mg/kg	0.11	U	0.12	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.1	U
MCP Polychlorinated Biphenyls																							
Aroclor 1016	12674-11-2	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1221	11104-28-2	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1232	11141-16-5	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1242	53469-21-9	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1248	12672-29-6	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1254	11097-69-1	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1260	11096-82-5	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1262	37324-23-5	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Aroclor 1268	11100-14-4	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
PCBs, Total	1336-36-3	1	mg/kg	0.0378	U	0.0372	U	0.0365	U	0.0351	U	0.0365	U	0.037	U	0.0348	U	0.0351	U	0.0355	U	0.0831	U
Petroleum Hydrocarbon Quantitation																							
TPH	---	1000	mg/kg	37.1	U	40.5		37.1	U	34.3	U	36.8	U	35.3	U	35.9	U	34.8	U	34.9	U	34.6	U

Alpha Analytical Labs provides this custom reporting format as a convenience to our clients. As such, we cannot be held liable for errors or omissions associated with the regulatory standards listed above and/or the sample results highlighted by comparison with the standards (Effective as of April 25, 2014).

Only compounds detected with reporting limits that exceed the corresponding regulatory standard in at least one sample are included on the summary sheets.

Refer to the laboratory report in Adobe Acrobat (.PDF) format to check results or read any associated project narrative that may be present. In all cases, the signed, hardcopy Alpha Analytical Labs laboratory report is the official document for reporting laboratory results.

ANALYTICAL REPORT

Lab Number:	L1825765
Client:	Lord Associates, Inc. 1506 Providence Highway - Suite 30 Norwood, MA 02062
ATTN:	Ralph Tella
Phone:	(781) 255-5554
Project Name:	WORC SO HS.
Project Number:	2693
Report Date:	07/16/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Alpha Sample ID	**Client ID**	**Matrix**	**Sample Location**	**Collection Date/Time**	**Receive Date**
L1825765-01	A-1	SOIL	ATHLETIC FIELD	07/06/18 10:30	07/06/18
L1825765-02	A-2	SOIL	ATHLETIC FIELD	07/06/18 10:20	07/06/18
L1825765-03	A-3	SOIL	ATHLETIC FIELD	07/06/18 10:10	07/06/18
L1825765-04	A-4	SOIL	ATHLETIC FIELD	07/06/18 10:00	07/06/18
L1825765-05	A-5	SOIL	ATHLETIC FIELD	07/06/18 09:59	07/06/18
L1825765-06	A-6	SOIL	ATHLETIC FIELD	07/06/18 09:55	07/06/18
L1825765-07	A-7	SOIL	ATHLETIC FIELD	07/06/18 09:56	07/06/18
L1825765-08	A-8	SOIL	ATHLETIC FIELD	07/06/18 09:55	07/06/18
L1825765-09	A-9	SOIL	ATHLETIC FIELD	07/06/18 09:50	07/06/18
L1825765-10	A-10	SOIL	ATHLETIC FIELD	07/06/18 09:30	07/06/18

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	NO
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question A:

The samples were received at the laboratory above the required temperature range. The samples were delivered directly from the sampling site but were not on ice.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

In reference to question G:

L1825765-01 through -10: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The initial calibration, associated with L1825765-01 through -10, did not meet the method required minimum response factor on the lowest calibration standard for 1,4-dioxane (0.0037), as well as the average response factor for 1,4-dioxane.

The continuing calibration standard, associated with L1825765-01 through -10, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Cripps Melissa Cripps

Title: Technical Director/Representative Date: 07/16/18

ORGANICS

VOLATILES

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/11/18 21:00
Analyst: MV
Percent Solids: 86%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	200	--	1
1,1-Dichloroethane	ND		ug/kg	41	--	1
Chloroform	ND		ug/kg	61	--	1
Carbon tetrachloride	ND		ug/kg	41	--	1
1,2-Dichloropropane	ND		ug/kg	41	--	1
Dibromochloromethane	ND		ug/kg	41	--	1
1,1,2-Trichloroethane	ND		ug/kg	41	--	1
Tetrachloroethene	ND		ug/kg	20	--	1
Chlorobenzene	ND		ug/kg	20	--	1
Trichlorofluoromethane	ND		ug/kg	160	--	1
1,2-Dichloroethane	ND		ug/kg	41	--	1
1,1,1-Trichloroethane	ND		ug/kg	20	--	1
Bromodichloromethane	ND		ug/kg	20	--	1
trans-1,3-Dichloropropene	ND		ug/kg	41	--	1
cis-1,3-Dichloropropene	ND		ug/kg	20	--	1
1,3-Dichloropropene, Total	ND		ug/kg	20	--	1
1,1-Dichloropropene	ND		ug/kg	20	--	1
Bromoform	ND		ug/kg	160	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	20	--	1
Benzene	ND		ug/kg	20	--	1
Toluene	ND		ug/kg	41	--	1
Ethylbenzene	ND		ug/kg	41	--	1
Chloromethane	ND		ug/kg	160	--	1
Bromomethane	ND		ug/kg	82	--	1
Vinyl chloride	ND		ug/kg	41	--	1
Chloroethane	ND		ug/kg	82	--	1
1,1-Dichloroethene	ND		ug/kg	41	--	1
trans-1,2-Dichloroethene	ND		ug/kg	61	--	1

Project Name: WORC SO HS. **Lab Number:** L1825765

Project Number: 2693 **Report Date:** 07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	20	--	1
1,2-Dichlorobenzene	ND		ug/kg	82	--	1
1,3-Dichlorobenzene	ND		ug/kg	82	--	1
1,4-Dichlorobenzene	ND		ug/kg	82	--	1
Methyl tert butyl ether	ND		ug/kg	82	--	1
p/m-Xylene	ND		ug/kg	82	--	1
o-Xylene	ND		ug/kg	41	--	1
Xylenes, Total	ND		ug/kg	41	--	1
cis-1,2-Dichloroethene	ND		ug/kg	41	--	1
1,2-Dichloroethene, Total	ND		ug/kg	41	--	1
Dibromomethane	ND		ug/kg	82	--	1
1,2,3-Trichloropropane	ND		ug/kg	82	--	1
Styrene	ND		ug/kg	41	--	1
Dichlorodifluoromethane	ND		ug/kg	410	--	1
Acetone	ND		ug/kg	410	--	1
Carbon disulfide	ND		ug/kg	410	--	1
Methyl ethyl ketone	ND		ug/kg	410	--	1
Methyl isobutyl ketone	ND		ug/kg	410	--	1
2-Hexanone	ND		ug/kg	410	--	1
Bromochloromethane	ND		ug/kg	82	--	1
Tetrahydrofuran	ND		ug/kg	160	--	1
2,2-Dichloropropane	ND		ug/kg	82	--	1
1,2-Dibromoethane	ND		ug/kg	41	--	1
1,3-Dichloropropane	ND		ug/kg	82	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	20	--	1
Bromobenzene	ND		ug/kg	82	--	1
n-Butylbenzene	ND		ug/kg	41	--	1
sec-Butylbenzene	ND		ug/kg	41	--	1
tert-Butylbenzene	ND		ug/kg	82	--	1
o-Chlorotoluene	ND		ug/kg	82	--	1
p-Chlorotoluene	ND		ug/kg	82	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	120	--	1
Hexachlorobutadiene	ND		ug/kg	160	--	1
Isopropylbenzene	ND		ug/kg	41	--	1
p-Isopropyltoluene	ND		ug/kg	41	--	1
Naphthalene	ND		ug/kg	160	--	1
n-Propylbenzene	ND		ug/kg	41	--	1

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	82	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	82	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	82	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	82	--	1
Diethyl ether	ND		ug/kg	82	--	1
Diisopropyl Ether	ND		ug/kg	82	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	82	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	82	--	1
1,4-Dioxane	ND		ug/kg	4100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	88		70-130

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Analytical Method: 97,8260C

Analytical Date: 07/11/18 21:25

Analyst: MV

Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	310	--	1
1,1-Dichloroethane	ND		ug/kg	62	--	1
Chloroform	ND		ug/kg	93	--	1
Carbon tetrachloride	ND		ug/kg	62	--	1
1,2-Dichloropropane	ND		ug/kg	62	--	1
Dibromochloromethane	ND		ug/kg	62	--	1
1,1,2-Trichloroethane	ND		ug/kg	62	--	1
Tetrachloroethene	ND		ug/kg	31	--	1
Chlorobenzene	ND		ug/kg	31	--	1
Trichlorofluoromethane	ND		ug/kg	250	--	1
1,2-Dichloroethane	ND		ug/kg	62	--	1
1,1,1-Trichloroethane	ND		ug/kg	31	--	1
Bromodichloromethane	ND		ug/kg	31	--	1
trans-1,3-Dichloropropene	ND		ug/kg	62	--	1
cis-1,3-Dichloropropene	ND		ug/kg	31	--	1
1,3-Dichloropropene, Total	ND		ug/kg	31	--	1
1,1-Dichloropropene	ND		ug/kg	31	--	1
Bromoform	ND		ug/kg	250	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	31	--	1
Benzene	ND		ug/kg	31	--	1
Toluene	ND		ug/kg	62	--	1
Ethylbenzene	ND		ug/kg	62	--	1
Chloromethane	ND		ug/kg	250	--	1
Bromomethane	ND		ug/kg	120	--	1
Vinyl chloride	ND		ug/kg	62	--	1
Chloroethane	ND		ug/kg	120	--	1
1,1-Dichloroethene	ND		ug/kg	62	--	1
trans-1,2-Dichloroethene	ND		ug/kg	93	--	1

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

MCP Volatile Organics by 5035 High - Westborough Lab

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Trichloroethene	ND		ug/kg	31	--	1
1,2-Dichlorobenzene	ND		ug/kg	120	--	1
1,3-Dichlorobenzene	ND		ug/kg	120	--	1
1,4-Dichlorobenzene	ND		ug/kg	120	--	1
Methyl tert butyl ether	ND		ug/kg	120	--	1
p/m-Xylene	ND		ug/kg	120	--	1
o-Xylene	ND		ug/kg	62	--	1
Xylenes, Total	ND		ug/kg	62	--	1
cis-1,2-Dichloroethene	ND		ug/kg	62	--	1
1,2-Dichloroethene, Total	ND		ug/kg	62	--	1
Dibromomethane	ND		ug/kg	120	--	1
1,2,3-Trichloropropane	ND		ug/kg	120	--	1
Styrene	ND		ug/kg	62	--	1
Dichlorodifluoromethane	ND		ug/kg	620	--	1
Acetone	ND		ug/kg	620	--	1
Carbon disulfide	ND		ug/kg	620	--	1
Methyl ethyl ketone	ND		ug/kg	620	--	1
Methyl isobutyl ketone	ND		ug/kg	620	--	1
2-Hexanone	ND		ug/kg	620	--	1
Bromochloromethane	ND		ug/kg	120	--	1
Tetrahydrofuran	ND		ug/kg	250	--	1
2,2-Dichloropropane	ND		ug/kg	120	--	1
1,2-Dibromoethane	ND		ug/kg	62	--	1
1,3-Dichloropropane	ND		ug/kg	120	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	31	--	1
Bromobenzene	ND		ug/kg	120	--	1
n-Butylbenzene	ND		ug/kg	62	--	1
sec-Butylbenzene	ND		ug/kg	62	--	1
tert-Butylbenzene	ND		ug/kg	120	--	1
o-Chlorotoluene	ND		ug/kg	120	--	1
p-Chlorotoluene	ND		ug/kg	120	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	250	--	1
Isopropylbenzene	ND		ug/kg	62	--	1
p-Isopropyltoluene	ND		ug/kg	62	--	1
Naphthalene	ND		ug/kg	250	--	1
n-Propylbenzene	ND		ug/kg	62	--	1

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	120	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	120	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	120	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	120	--	1
Diethyl ether	ND		ug/kg	120	--	1
Diisopropyl Ether	ND		ug/kg	120	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	120	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	120	--	1
1,4-Dioxane	ND		ug/kg	6200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	88		70-130

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Analytical Method: 97,8260C

Analytical Date: 07/11/18 21:51

Analyst: MV

Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	210	--	1
1,1-Dichloroethane	ND		ug/kg	42	--	1
Chloroform	ND		ug/kg	63	--	1
Carbon tetrachloride	ND		ug/kg	42	--	1
1,2-Dichloropropane	ND		ug/kg	42	--	1
Dibromochloromethane	ND		ug/kg	42	--	1
1,1,2-Trichloroethane	ND		ug/kg	42	--	1
Tetrachloroethene	ND		ug/kg	21	--	1
Chlorobenzene	ND		ug/kg	21	--	1
Trichlorofluoromethane	ND		ug/kg	170	--	1
1,2-Dichloroethane	ND		ug/kg	42	--	1
1,1,1-Trichloroethane	ND		ug/kg	21	--	1
Bromodichloromethane	ND		ug/kg	21	--	1
trans-1,3-Dichloropropene	ND		ug/kg	42	--	1
cis-1,3-Dichloropropene	ND		ug/kg	21	--	1
1,3-Dichloropropene, Total	ND		ug/kg	21	--	1
1,1-Dichloropropene	ND		ug/kg	21	--	1
Bromoform	ND		ug/kg	170	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	21	--	1
Benzene	ND		ug/kg	21	--	1
Toluene	ND		ug/kg	42	--	1
Ethylbenzene	ND		ug/kg	42	--	1
Chloromethane	ND		ug/kg	170	--	1
Bromomethane	ND		ug/kg	84	--	1
Vinyl chloride	ND		ug/kg	42	--	1
Chloroethane	ND		ug/kg	84	--	1
1,1-Dichloroethene	ND		ug/kg	42	--	1
trans-1,2-Dichloroethene	ND		ug/kg	63	--	1

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	21	--	1
1,2-Dichlorobenzene	ND		ug/kg	84	--	1
1,3-Dichlorobenzene	ND		ug/kg	84	--	1
1,4-Dichlorobenzene	ND		ug/kg	84	--	1
Methyl tert butyl ether	ND		ug/kg	84	--	1
p/m-Xylene	ND		ug/kg	84	--	1
o-Xylene	ND		ug/kg	42	--	1
Xylenes, Total	ND		ug/kg	42	--	1
cis-1,2-Dichloroethene	ND		ug/kg	42	--	1
1,2-Dichloroethene, Total	ND		ug/kg	42	--	1
Dibromomethane	ND		ug/kg	84	--	1
1,2,3-Trichloropropane	ND		ug/kg	84	--	1
Styrene	ND		ug/kg	42	--	1
Dichlorodifluoromethane	ND		ug/kg	420	--	1
Acetone	ND		ug/kg	420	--	1
Carbon disulfide	ND		ug/kg	420	--	1
Methyl ethyl ketone	ND		ug/kg	420	--	1
Methyl isobutyl ketone	ND		ug/kg	420	--	1
2-Hexanone	ND		ug/kg	420	--	1
Bromochloromethane	ND		ug/kg	84	--	1
Tetrahydrofuran	ND		ug/kg	170	--	1
2,2-Dichloropropane	ND		ug/kg	84	--	1
1,2-Dibromoethane	ND		ug/kg	42	--	1
1,3-Dichloropropane	ND		ug/kg	84	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	21	--	1
Bromobenzene	ND		ug/kg	84	--	1
n-Butylbenzene	ND		ug/kg	42	--	1
sec-Butylbenzene	ND		ug/kg	42	--	1
tert-Butylbenzene	ND		ug/kg	84	--	1
o-Chlorotoluene	ND		ug/kg	84	--	1
p-Chlorotoluene	ND		ug/kg	84	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	130	--	1
Hexachlorobutadiene	ND		ug/kg	170	--	1
Isopropylbenzene	ND		ug/kg	42	--	1
p-Isopropyltoluene	ND		ug/kg	42	--	1
Naphthalene	ND		ug/kg	170	--	1
n-Propylbenzene	ND		ug/kg	42	--	1

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	84	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	84	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	84	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	84	--	1
Diethyl ether	ND		ug/kg	84	--	1
Diisopropyl Ether	ND		ug/kg	84	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	84	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	84	--	1
1,4-Dioxane	ND		ug/kg	4200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	89		70-130

SAMPLE RESULTS

Lab ID: L1825765-04
Client ID: A-4
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 10:00
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/11/18 22:16
Analyst: MV
Percent Solids: 93%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	160	--	1
1,1-Dichloroethane	ND		ug/kg	33	--	1
Chloroform	ND		ug/kg	50	--	1
Carbon tetrachloride	ND		ug/kg	33	--	1
1,2-Dichloropropane	ND		ug/kg	33	--	1
Dibromochloromethane	ND		ug/kg	33	--	1
1,1,2-Trichloroethane	ND		ug/kg	33	--	1
Tetrachloroethene	ND		ug/kg	16	--	1
Chlorobenzene	ND		ug/kg	16	--	1
Trichlorofluoromethane	ND		ug/kg	130	--	1
1,2-Dichloroethane	ND		ug/kg	33	--	1
1,1,1-Trichloroethane	ND		ug/kg	16	--	1
Bromodichloromethane	ND		ug/kg	16	--	1
trans-1,3-Dichloropropene	ND		ug/kg	33	--	1
cis-1,3-Dichloropropene	ND		ug/kg	16	--	1
1,3-Dichloropropene, Total	ND		ug/kg	16	--	1
1,1-Dichloropropene	ND		ug/kg	16	--	1
Bromoform	ND		ug/kg	130	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	16	--	1
Benzene	ND		ug/kg	16	--	1
Toluene	ND		ug/kg	33	--	1
Ethylbenzene	ND		ug/kg	33	--	1
Chloromethane	ND		ug/kg	130	--	1
Bromomethane	ND		ug/kg	66	--	1
Vinyl chloride	ND		ug/kg	33	--	1
Chloroethane	ND		ug/kg	66	--	1
1,1-Dichloroethene	ND		ug/kg	33	--	1
trans-1,2-Dichloroethene	ND		ug/kg	50	--	1

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	16	--	1
1,2-Dichlorobenzene	ND		ug/kg	66	--	1
1,3-Dichlorobenzene	ND		ug/kg	66	--	1
1,4-Dichlorobenzene	ND		ug/kg	66	--	1
Methyl tert butyl ether	ND		ug/kg	66	--	1
p/m-Xylene	ND		ug/kg	66	--	1
o-Xylene	ND		ug/kg	33	--	1
Xylenes, Total	ND		ug/kg	33	--	1
cis-1,2-Dichloroethene	ND		ug/kg	33	--	1
1,2-Dichloroethene, Total	ND		ug/kg	33	--	1
Dibromomethane	ND		ug/kg	66	--	1
1,2,3-Trichloropropane	ND		ug/kg	66	--	1
Styrene	ND		ug/kg	33	--	1
Dichlorodifluoromethane	ND		ug/kg	330	--	1
Acetone	ND		ug/kg	330	--	1
Carbon disulfide	ND		ug/kg	330	--	1
Methyl ethyl ketone	ND		ug/kg	330	--	1
Methyl isobutyl ketone	ND		ug/kg	330	--	1
2-Hexanone	ND		ug/kg	330	--	1
Bromochloromethane	ND		ug/kg	66	--	1
Tetrahydrofuran	ND		ug/kg	130	--	1
2,2-Dichloropropane	ND		ug/kg	66	--	1
1,2-Dibromoethane	ND		ug/kg	33	--	1
1,3-Dichloropropane	ND		ug/kg	66	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	16	--	1
Bromobenzene	ND		ug/kg	66	--	1
n-Butylbenzene	ND		ug/kg	33	--	1
sec-Butylbenzene	ND		ug/kg	33	--	1
tert-Butylbenzene	ND		ug/kg	66	--	1
o-Chlorotoluene	ND		ug/kg	66	--	1
p-Chlorotoluene	ND		ug/kg	66	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	99	--	1
Hexachlorobutadiene	ND		ug/kg	130	--	1
Isopropylbenzene	ND		ug/kg	33	--	1
p-Isopropyltoluene	ND		ug/kg	33	--	1
Naphthalene	ND		ug/kg	130	--	1
n-Propylbenzene	ND		ug/kg	33	--	1

SAMPLE RESULTS

Lab ID: L1825765-04
Client ID: A-4
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 10:00
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	66	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	66	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	66	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	66	--	1
Diethyl ether	ND		ug/kg	66	--	1
Diisopropyl Ether	ND		ug/kg	66	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	66	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	66	--	1
1,4-Dioxane	ND		ug/kg	3300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	88		70-130

SAMPLE RESULTS

Lab ID: L1825765-05
Client ID: A-5
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:59
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/11/18 22:42
Analyst: MV
Percent Solids: 87%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	170	--	1
1,1-Dichloroethane	ND		ug/kg	34	--	1
Chloroform	ND		ug/kg	50	--	1
Carbon tetrachloride	ND		ug/kg	34	--	1
1,2-Dichloropropane	ND		ug/kg	34	--	1
Dibromochloromethane	ND		ug/kg	34	--	1
1,1,2-Trichloroethane	ND		ug/kg	34	--	1
Tetrachloroethene	ND		ug/kg	17	--	1
Chlorobenzene	ND		ug/kg	17	--	1
Trichlorofluoromethane	ND		ug/kg	130	--	1
1,2-Dichloroethane	ND		ug/kg	34	--	1
1,1,1-Trichloroethane	ND		ug/kg	17	--	1
Bromodichloromethane	ND		ug/kg	17	--	1
trans-1,3-Dichloropropene	ND		ug/kg	34	--	1
cis-1,3-Dichloropropene	ND		ug/kg	17	--	1
1,3-Dichloropropene, Total	ND		ug/kg	17	--	1
1,1-Dichloropropene	ND		ug/kg	17	--	1
Bromoform	ND		ug/kg	130	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	17	--	1
Benzene	ND		ug/kg	17	--	1
Toluene	ND		ug/kg	34	--	1
Ethylbenzene	ND		ug/kg	34	--	1
Chloromethane	ND		ug/kg	130	--	1
Bromomethane	ND		ug/kg	67	--	1
Vinyl chloride	ND		ug/kg	34	--	1
Chloroethane	ND		ug/kg	67	--	1
1,1-Dichloroethene	ND		ug/kg	34	--	1
trans-1,2-Dichloroethene	ND		ug/kg	50	--	1

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	17	--	1
1,2-Dichlorobenzene	ND		ug/kg	67	--	1
1,3-Dichlorobenzene	ND		ug/kg	67	--	1
1,4-Dichlorobenzene	ND		ug/kg	67	--	1
Methyl tert butyl ether	ND		ug/kg	67	--	1
p/m-Xylene	ND		ug/kg	67	--	1
o-Xylene	ND		ug/kg	34	--	1
Xylenes, Total	ND		ug/kg	34	--	1
cis-1,2-Dichloroethene	ND		ug/kg	34	--	1
1,2-Dichloroethene, Total	ND		ug/kg	34	--	1
Dibromomethane	ND		ug/kg	67	--	1
1,2,3-Trichloropropane	ND		ug/kg	67	--	1
Styrene	ND		ug/kg	34	--	1
Dichlorodifluoromethane	ND		ug/kg	340	--	1
Acetone	ND		ug/kg	340	--	1
Carbon disulfide	ND		ug/kg	340	--	1
Methyl ethyl ketone	ND		ug/kg	340	--	1
Methyl isobutyl ketone	ND		ug/kg	340	--	1
2-Hexanone	ND		ug/kg	340	--	1
Bromochloromethane	ND		ug/kg	67	--	1
Tetrahydrofuran	ND		ug/kg	130	--	1
2,2-Dichloropropane	ND		ug/kg	67	--	1
1,2-Dibromoethane	ND		ug/kg	34	--	1
1,3-Dichloropropane	ND		ug/kg	67	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	17	--	1
Bromobenzene	ND		ug/kg	67	--	1
n-Butylbenzene	ND		ug/kg	34	--	1
sec-Butylbenzene	ND		ug/kg	34	--	1
tert-Butylbenzene	ND		ug/kg	67	--	1
o-Chlorotoluene	ND		ug/kg	67	--	1
p-Chlorotoluene	ND		ug/kg	67	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	100	--	1
Hexachlorobutadiene	ND		ug/kg	130	--	1
Isopropylbenzene	ND		ug/kg	34	--	1
p-Isopropyltoluene	ND		ug/kg	34	--	1
Naphthalene	ND		ug/kg	130	--	1
n-Propylbenzene	ND		ug/kg	34	--	1

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	67	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	67	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	67	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	67	--	1
Diethyl ether	ND		ug/kg	67	--	1
Diisopropyl Ether	ND		ug/kg	67	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	67	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	67	--	1
1,4-Dioxane	ND		ug/kg	3400	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	88		70-130

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Analytical Method: 97,8260C

Analytical Date: 07/11/18 23:07

Analyst: MV

Percent Solids: 89%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	190	--	1
1,1-Dichloroethane	ND		ug/kg	38	--	1
Chloroform	ND		ug/kg	57	--	1
Carbon tetrachloride	ND		ug/kg	38	--	1
1,2-Dichloropropane	ND		ug/kg	38	--	1
Dibromochloromethane	ND		ug/kg	38	--	1
1,1,2-Trichloroethane	ND		ug/kg	38	--	1
Tetrachloroethene	ND		ug/kg	19	--	1
Chlorobenzene	ND		ug/kg	19	--	1
Trichlorofluoromethane	ND		ug/kg	150	--	1
1,2-Dichloroethane	ND		ug/kg	38	--	1
1,1,1-Trichloroethane	ND		ug/kg	19	--	1
Bromodichloromethane	ND		ug/kg	19	--	1
trans-1,3-Dichloropropene	ND		ug/kg	38	--	1
cis-1,3-Dichloropropene	ND		ug/kg	19	--	1
1,3-Dichloropropene, Total	ND		ug/kg	19	--	1
1,1-Dichloropropene	ND		ug/kg	19	--	1
Bromoform	ND		ug/kg	150	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	19	--	1
Benzene	ND		ug/kg	19	--	1
Toluene	ND		ug/kg	38	--	1
Ethylbenzene	ND		ug/kg	38	--	1
Chloromethane	ND		ug/kg	150	--	1
Bromomethane	ND		ug/kg	76	--	1
Vinyl chloride	ND		ug/kg	38	--	1
Chloroethane	ND		ug/kg	76	--	1
1,1-Dichloroethene	ND		ug/kg	38	--	1
trans-1,2-Dichloroethene	ND		ug/kg	57	--	1

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	19	--	1
1,2-Dichlorobenzene	ND		ug/kg	76	--	1
1,3-Dichlorobenzene	ND		ug/kg	76	--	1
1,4-Dichlorobenzene	ND		ug/kg	76	--	1
Methyl tert butyl ether	ND		ug/kg	76	--	1
p/m-Xylene	ND		ug/kg	76	--	1
o-Xylene	ND		ug/kg	38	--	1
Xylenes, Total	ND		ug/kg	38	--	1
cis-1,2-Dichloroethene	ND		ug/kg	38	--	1
1,2-Dichloroethene, Total	ND		ug/kg	38	--	1
Dibromomethane	ND		ug/kg	76	--	1
1,2,3-Trichloropropane	ND		ug/kg	76	--	1
Styrene	ND		ug/kg	38	--	1
Dichlorodifluoromethane	ND		ug/kg	380	--	1
Acetone	ND		ug/kg	380	--	1
Carbon disulfide	ND		ug/kg	380	--	1
Methyl ethyl ketone	ND		ug/kg	380	--	1
Methyl isobutyl ketone	ND		ug/kg	380	--	1
2-Hexanone	ND		ug/kg	380	--	1
Bromochloromethane	ND		ug/kg	76	--	1
Tetrahydrofuran	ND		ug/kg	150	--	1
2,2-Dichloropropane	ND		ug/kg	76	--	1
1,2-Dibromoethane	ND		ug/kg	38	--	1
1,3-Dichloropropane	ND		ug/kg	76	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	19	--	1
Bromobenzene	ND		ug/kg	76	--	1
n-Butylbenzene	ND		ug/kg	38	--	1
sec-Butylbenzene	ND		ug/kg	38	--	1
tert-Butylbenzene	ND		ug/kg	76	--	1
o-Chlorotoluene	ND		ug/kg	76	--	1
p-Chlorotoluene	ND		ug/kg	76	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	110	--	1
Hexachlorobutadiene	ND		ug/kg	150	--	1
Isopropylbenzene	ND		ug/kg	38	--	1
p-Isopropyltoluene	ND		ug/kg	38	--	1
Naphthalene	ND		ug/kg	150	--	1
n-Propylbenzene	ND		ug/kg	38	--	1

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	76	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	76	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	76	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	76	--	1
Diethyl ether	ND		ug/kg	76	--	1
Diisopropyl Ether	ND		ug/kg	76	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	76	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	76	--	1
1,4-Dioxane	ND		ug/kg	3800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	89		70-130

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/11/18 23:33
Analyst: MV
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	210	--	1
1,1-Dichloroethane	ND		ug/kg	41	--	1
Chloroform	ND		ug/kg	62	--	1
Carbon tetrachloride	ND		ug/kg	41	--	1
1,2-Dichloropropane	ND		ug/kg	41	--	1
Dibromochloromethane	ND		ug/kg	41	--	1
1,1,2-Trichloroethane	ND		ug/kg	41	--	1
Tetrachloroethene	ND		ug/kg	21	--	1
Chlorobenzene	ND		ug/kg	21	--	1
Trichlorofluoromethane	ND		ug/kg	160	--	1
1,2-Dichloroethane	ND		ug/kg	41	--	1
1,1,1-Trichloroethane	ND		ug/kg	21	--	1
Bromodichloromethane	ND		ug/kg	21	--	1
trans-1,3-Dichloropropene	ND		ug/kg	41	--	1
cis-1,3-Dichloropropene	ND		ug/kg	21	--	1
1,3-Dichloropropene, Total	ND		ug/kg	21	--	1
1,1-Dichloropropene	ND		ug/kg	21	--	1
Bromoform	ND		ug/kg	160	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	21	--	1
Benzene	ND		ug/kg	21	--	1
Toluene	ND		ug/kg	41	--	1
Ethylbenzene	ND		ug/kg	41	--	1
Chloromethane	ND		ug/kg	160	--	1
Bromomethane	ND		ug/kg	83	--	1
Vinyl chloride	ND		ug/kg	41	--	1
Chloroethane	ND		ug/kg	83	--	1
1,1-Dichloroethene	ND		ug/kg	41	--	1
trans-1,2-Dichloroethene	ND		ug/kg	62	--	1

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	21	--	1
1,2-Dichlorobenzene	ND		ug/kg	83	--	1
1,3-Dichlorobenzene	ND		ug/kg	83	--	1
1,4-Dichlorobenzene	ND		ug/kg	83	--	1
Methyl tert butyl ether	ND		ug/kg	83	--	1
p/m-Xylene	ND		ug/kg	83	--	1
o-Xylene	ND		ug/kg	41	--	1
Xylenes, Total	ND		ug/kg	41	--	1
cis-1,2-Dichloroethene	ND		ug/kg	41	--	1
1,2-Dichloroethene, Total	ND		ug/kg	41	--	1
Dibromomethane	ND		ug/kg	83	--	1
1,2,3-Trichloropropane	ND		ug/kg	83	--	1
Styrene	ND		ug/kg	41	--	1
Dichlorodifluoromethane	ND		ug/kg	410	--	1
Acetone	ND		ug/kg	410	--	1
Carbon disulfide	ND		ug/kg	410	--	1
Methyl ethyl ketone	ND		ug/kg	410	--	1
Methyl isobutyl ketone	ND		ug/kg	410	--	1
2-Hexanone	ND		ug/kg	410	--	1
Bromochloromethane	ND		ug/kg	83	--	1
Tetrahydrofuran	ND		ug/kg	160	--	1
2,2-Dichloropropane	ND		ug/kg	83	--	1
1,2-Dibromoethane	ND		ug/kg	41	--	1
1,3-Dichloropropane	ND		ug/kg	83	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	21	--	1
Bromobenzene	ND		ug/kg	83	--	1
n-Butylbenzene	ND		ug/kg	41	--	1
sec-Butylbenzene	ND		ug/kg	41	--	1
tert-Butylbenzene	ND		ug/kg	83	--	1
o-Chlorotoluene	ND		ug/kg	83	--	1
p-Chlorotoluene	ND		ug/kg	83	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	120	--	1
Hexachlorobutadiene	ND		ug/kg	160	--	1
Isopropylbenzene	ND		ug/kg	41	--	1
p-Isopropyltoluene	ND		ug/kg	41	--	1
Naphthalene	ND		ug/kg	160	--	1
n-Propylbenzene	ND		ug/kg	41	--	1

SAMPLE RESULTS

Lab ID: L1825765-07
Client ID: A-7
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:56
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	83	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	83	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	83	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	83	--	1
Diethyl ether	ND		ug/kg	83	--	1
Diisopropyl Ether	ND		ug/kg	83	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	83	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	83	--	1
1,4-Dioxane	ND		ug/kg	4100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	87		70-130

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/11/18 23:59
Analyst: MV
Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	140	--	1
1,1-Dichloroethane	ND		ug/kg	29	--	1
Chloroform	ND		ug/kg	43	--	1
Carbon tetrachloride	ND		ug/kg	29	--	1
1,2-Dichloropropane	ND		ug/kg	29	--	1
Dibromochloromethane	ND		ug/kg	29	--	1
1,1,2-Trichloroethane	ND		ug/kg	29	--	1
Tetrachloroethene	ND		ug/kg	14	--	1
Chlorobenzene	ND		ug/kg	14	--	1
Trichlorofluoromethane	ND		ug/kg	110	--	1
1,2-Dichloroethane	ND		ug/kg	29	--	1
1,1,1-Trichloroethane	ND		ug/kg	14	--	1
Bromodichloromethane	ND		ug/kg	14	--	1
trans-1,3-Dichloropropene	ND		ug/kg	29	--	1
cis-1,3-Dichloropropene	ND		ug/kg	14	--	1
1,3-Dichloropropene, Total	ND		ug/kg	14	--	1
1,1-Dichloropropene	ND		ug/kg	14	--	1
Bromoform	ND		ug/kg	110	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	14	--	1
Benzene	ND		ug/kg	14	--	1
Toluene	ND		ug/kg	29	--	1
Ethylbenzene	ND		ug/kg	29	--	1
Chloromethane	ND		ug/kg	110	--	1
Bromomethane	ND		ug/kg	57	--	1
Vinyl chloride	ND		ug/kg	29	--	1
Chloroethane	ND		ug/kg	57	--	1
1,1-Dichloroethene	ND		ug/kg	29	--	1
trans-1,2-Dichloroethene	ND		ug/kg	43	--	1

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	14	--	1
1,2-Dichlorobenzene	ND		ug/kg	57	--	1
1,3-Dichlorobenzene	ND		ug/kg	57	--	1
1,4-Dichlorobenzene	ND		ug/kg	57	--	1
Methyl tert butyl ether	ND		ug/kg	57	--	1
p/m-Xylene	ND		ug/kg	57	--	1
o-Xylene	ND		ug/kg	29	--	1
Xylenes, Total	ND		ug/kg	29	--	1
cis-1,2-Dichloroethene	ND		ug/kg	29	--	1
1,2-Dichloroethene, Total	ND		ug/kg	29	--	1
Dibromomethane	ND		ug/kg	57	--	1
1,2,3-Trichloropropane	ND		ug/kg	57	--	1
Styrene	ND		ug/kg	29	--	1
Dichlorodifluoromethane	ND		ug/kg	290	--	1
Acetone	ND		ug/kg	290	--	1
Carbon disulfide	ND		ug/kg	290	--	1
Methyl ethyl ketone	ND		ug/kg	290	--	1
Methyl isobutyl ketone	ND		ug/kg	290	--	1
2-Hexanone	ND		ug/kg	290	--	1
Bromochloromethane	ND		ug/kg	57	--	1
Tetrahydrofuran	ND		ug/kg	110	--	1
2,2-Dichloropropane	ND		ug/kg	57	--	1
1,2-Dibromoethane	ND		ug/kg	29	--	1
1,3-Dichloropropane	ND		ug/kg	57	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	14	--	1
Bromobenzene	ND		ug/kg	57	--	1
n-Butylbenzene	ND		ug/kg	29	--	1
sec-Butylbenzene	ND		ug/kg	29	--	1
tert-Butylbenzene	ND		ug/kg	57	--	1
o-Chlorotoluene	ND		ug/kg	57	--	1
p-Chlorotoluene	ND		ug/kg	57	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	86	--	1
Hexachlorobutadiene	ND		ug/kg	110	--	1
Isopropylbenzene	ND		ug/kg	29	--	1
p-Isopropyltoluene	ND		ug/kg	29	--	1
Naphthalene	ND		ug/kg	110	--	1
n-Propylbenzene	ND		ug/kg	29	--	1

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	57	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	57	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	57	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	57	--	1
Diethyl ether	ND		ug/kg	57	--	1
Diisopropyl Ether	ND		ug/kg	57	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	57	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	57	--	1
1,4-Dioxane	ND		ug/kg	2900	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	89		70-130

SAMPLE RESULTS

Lab ID: L1825765-09
Client ID: A-9
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:50
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/12/18 00:24
Analyst: MV
Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	150	--	1
1,1-Dichloroethane	ND		ug/kg	30	--	1
Chloroform	ND		ug/kg	45	--	1
Carbon tetrachloride	ND		ug/kg	30	--	1
1,2-Dichloropropane	ND		ug/kg	30	--	1
Dibromochloromethane	ND		ug/kg	30	--	1
1,1,2-Trichloroethane	ND		ug/kg	30	--	1
Tetrachloroethene	ND		ug/kg	15	--	1
Chlorobenzene	ND		ug/kg	15	--	1
Trichlorofluoromethane	ND		ug/kg	120	--	1
1,2-Dichloroethane	ND		ug/kg	30	--	1
1,1,1-Trichloroethane	ND		ug/kg	15	--	1
Bromodichloromethane	ND		ug/kg	15	--	1
trans-1,3-Dichloropropene	ND		ug/kg	30	--	1
cis-1,3-Dichloropropene	ND		ug/kg	15	--	1
1,3-Dichloropropene, Total	ND		ug/kg	15	--	1
1,1-Dichloropropene	ND		ug/kg	15	--	1
Bromoform	ND		ug/kg	120	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	15	--	1
Benzene	ND		ug/kg	15	--	1
Toluene	ND		ug/kg	30	--	1
Ethylbenzene	ND		ug/kg	30	--	1
Chloromethane	ND		ug/kg	120	--	1
Bromomethane	ND		ug/kg	61	--	1
Vinyl chloride	ND		ug/kg	30	--	1
Chloroethane	ND		ug/kg	61	--	1
1,1-Dichloroethene	ND		ug/kg	30	--	1
trans-1,2-Dichloroethene	ND		ug/kg	45	--	1

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	15	--	1
1,2-Dichlorobenzene	ND		ug/kg	61	--	1
1,3-Dichlorobenzene	ND		ug/kg	61	--	1
1,4-Dichlorobenzene	ND		ug/kg	61	--	1
Methyl tert butyl ether	ND		ug/kg	61	--	1
p/m-Xylene	ND		ug/kg	61	--	1
o-Xylene	ND		ug/kg	30	--	1
Xylenes, Total	ND		ug/kg	30	--	1
cis-1,2-Dichloroethene	ND		ug/kg	30	--	1
1,2-Dichloroethene, Total	ND		ug/kg	30	--	1
Dibromomethane	ND		ug/kg	61	--	1
1,2,3-Trichloropropane	ND		ug/kg	61	--	1
Styrene	ND		ug/kg	30	--	1
Dichlorodifluoromethane	ND		ug/kg	300	--	1
Acetone	ND		ug/kg	300	--	1
Carbon disulfide	ND		ug/kg	300	--	1
Methyl ethyl ketone	ND		ug/kg	300	--	1
Methyl isobutyl ketone	ND		ug/kg	300	--	1
2-Hexanone	ND		ug/kg	300	--	1
Bromochloromethane	ND		ug/kg	61	--	1
Tetrahydrofuran	ND		ug/kg	120	--	1
2,2-Dichloropropane	ND		ug/kg	61	--	1
1,2-Dibromoethane	ND		ug/kg	30	--	1
1,3-Dichloropropane	ND		ug/kg	61	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	15	--	1
Bromobenzene	ND		ug/kg	61	--	1
n-Butylbenzene	ND		ug/kg	30	--	1
sec-Butylbenzene	ND		ug/kg	30	--	1
tert-Butylbenzene	ND		ug/kg	61	--	1
o-Chlorotoluene	ND		ug/kg	61	--	1
p-Chlorotoluene	ND		ug/kg	61	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	91	--	1
Hexachlorobutadiene	ND		ug/kg	120	--	1
Isopropylbenzene	ND		ug/kg	30	--	1
p-Isopropyltoluene	ND		ug/kg	30	--	1
Naphthalene	ND		ug/kg	120	--	1
n-Propylbenzene	ND		ug/kg	30	--	1

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	61	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	61	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	61	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	61	--	1
Diethyl ether	ND		ug/kg	61	--	1
Diisopropyl Ether	ND		ug/kg	61	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	61	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	61	--	1
1,4-Dioxane	ND		ug/kg	3000	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	89		70-130

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 07/12/18 00:50
Analyst: MV
Percent Solids: 94%

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	170	--	1
1,1-Dichloroethane	ND		ug/kg	33	--	1
Chloroform	ND		ug/kg	50	--	1
Carbon tetrachloride	ND		ug/kg	33	--	1
1,2-Dichloropropane	ND		ug/kg	33	--	1
Dibromochloromethane	ND		ug/kg	33	--	1
1,1,2-Trichloroethane	ND		ug/kg	33	--	1
Tetrachloroethene	ND		ug/kg	17	--	1
Chlorobenzene	ND		ug/kg	17	--	1
Trichlorofluoromethane	ND		ug/kg	130	--	1
1,2-Dichloroethane	ND		ug/kg	33	--	1
1,1,1-Trichloroethane	ND		ug/kg	17	--	1
Bromodichloromethane	ND		ug/kg	17	--	1
trans-1,3-Dichloropropene	ND		ug/kg	33	--	1
cis-1,3-Dichloropropene	ND		ug/kg	17	--	1
1,3-Dichloropropene, Total	ND		ug/kg	17	--	1
1,1-Dichloropropene	ND		ug/kg	17	--	1
Bromoform	ND		ug/kg	130	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	17	--	1
Benzene	ND		ug/kg	17	--	1
Toluene	ND		ug/kg	33	--	1
Ethylbenzene	ND		ug/kg	33	--	1
Chloromethane	ND		ug/kg	130	--	1
Bromomethane	ND		ug/kg	67	--	1
Vinyl chloride	ND		ug/kg	33	--	1
Chloroethane	ND		ug/kg	67	--	1
1,1-Dichloroethene	ND		ug/kg	33	--	1
trans-1,2-Dichloroethene	ND		ug/kg	50	--	1

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	17	--	1
1,2-Dichlorobenzene	ND		ug/kg	67	--	1
1,3-Dichlorobenzene	ND		ug/kg	67	--	1
1,4-Dichlorobenzene	ND		ug/kg	67	--	1
Methyl tert butyl ether	ND		ug/kg	67	--	1
p/m-Xylene	ND		ug/kg	67	--	1
o-Xylene	ND		ug/kg	33	--	1
Xylenes, Total	ND		ug/kg	33	--	1
cis-1,2-Dichloroethene	ND		ug/kg	33	--	1
1,2-Dichloroethene, Total	ND		ug/kg	33	--	1
Dibromomethane	ND		ug/kg	67	--	1
1,2,3-Trichloropropane	ND		ug/kg	67	--	1
Styrene	ND		ug/kg	33	--	1
Dichlorodifluoromethane	ND		ug/kg	330	--	1
Acetone	ND		ug/kg	330	--	1
Carbon disulfide	ND		ug/kg	330	--	1
Methyl ethyl ketone	ND		ug/kg	330	--	1
Methyl isobutyl ketone	ND		ug/kg	330	--	1
2-Hexanone	ND		ug/kg	330	--	1
Bromochloromethane	ND		ug/kg	67	--	1
Tetrahydrofuran	ND		ug/kg	130	--	1
2,2-Dichloropropane	ND		ug/kg	67	--	1
1,2-Dibromoethane	ND		ug/kg	33	--	1
1,3-Dichloropropane	ND		ug/kg	67	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	17	--	1
Bromobenzene	ND		ug/kg	67	--	1
n-Butylbenzene	ND		ug/kg	33	--	1
sec-Butylbenzene	ND		ug/kg	33	--	1
tert-Butylbenzene	ND		ug/kg	67	--	1
o-Chlorotoluene	ND		ug/kg	67	--	1
p-Chlorotoluene	ND		ug/kg	67	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	100	--	1
Hexachlorobutadiene	ND		ug/kg	130	--	1
Isopropylbenzene	ND		ug/kg	33	--	1
p-Isopropyltoluene	ND		ug/kg	33	--	1
Naphthalene	ND		ug/kg	130	--	1
n-Propylbenzene	ND		ug/kg	33	--	1

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Volatile Organics by 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	67	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	67	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	67	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	67	--	1
Diethyl ether	ND		ug/kg	67	--	1
Diisopropyl Ether	ND		ug/kg	67	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	67	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	67	--	1
1,4-Dioxane	ND		ug/kg	3300	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	88		70-130

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 07/11/18 20:34
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-10 Batch: WG1134832-5					
Methylene chloride	ND		ug/kg	250	--
1,1-Dichloroethane	ND		ug/kg	50	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	50	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	50	--
Tetrachloroethene	ND		ug/kg	25	--
Chlorobenzene	ND		ug/kg	25	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	25	--
Bromodichloromethane	ND		ug/kg	25	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	25	--
1,3-Dichloropropene, Total	ND		ug/kg	25	--
1,1-Dichloropropene	ND		ug/kg	25	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	25	--
Benzene	ND		ug/kg	25	--
Toluene	ND		ug/kg	50	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	50	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	25	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 07/11/18 20:34
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-10 Batch: WG1134832-5					
1,2-Dichlorobenzene	ND		ug/kg	100	--
1,3-Dichlorobenzene	ND		ug/kg	100	--
1,4-Dichlorobenzene	ND		ug/kg	100	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	50	--
Xylenes, Total	ND		ug/kg	50	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	100	--
1,2,3-Trichloropropane	ND		ug/kg	100	--
Styrene	ND		ug/kg	50	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	500	--
Carbon disulfide	ND		ug/kg	500	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	100	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	100	--
1,2-Dibromoethane	ND		ug/kg	50	--
1,3-Dichloropropane	ND		ug/kg	100	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	25	--
Bromobenzene	ND		ug/kg	100	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	100	--
o-Chlorotoluene	ND		ug/kg	100	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 07/11/18 20:34
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-10 Batch: WG1134832-5					
p-Chlorotoluene	ND		ug/kg	100	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	150	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	100	--
1,2,4-Trichlorobenzene	ND		ug/kg	100	--
1,3,5-Trimethylbenzene	ND		ug/kg	100	--
1,2,4-Trimethylbenzene	ND		ug/kg	100	--
Diethyl ether	ND		ug/kg	100	--
Diisopropyl Ether	ND		ug/kg	100	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	100	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	100	--
1,4-Dioxane	ND		ug/kg	5000	--
2-Chloroethylvinyl ether	ND		ug/kg	1000	--
Halothane	ND		ug/kg	500	--
Ethyl Acetate	ND		ug/kg	500	--
Freon-113	ND		ug/kg	200	--
Vinyl acetate	ND		ug/kg	500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	89		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-10 Batch: WG1134832-3 WG1134832-4								
Methylene chloride	108		108		70-130	0		20
1,1-Dichloroethane	114		113		70-130	1		20
Chloroform	105		105		70-130	0		20
Carbon tetrachloride	100		98		70-130	2		20
1,2-Dichloropropane	115		116		70-130	1		20
Dibromochloromethane	96		95		70-130	1		20
1,1,2-Trichloroethane	107		106		70-130	1		20
Tetrachloroethene	94		92		70-130	2		20
Chlorobenzene	98		97		70-130	1		20
Trichlorofluoromethane	96		91		70-130	5		20
1,2-Dichloroethane	101		102		70-130	1		20
1,1,1-Trichloroethane	101		102		70-130	1		20
Bromodichloromethane	102		102		70-130	0		20
trans-1,3-Dichloropropene	105		106		70-130	1		20
cis-1,3-Dichloropropene	107		108		70-130	1		20
1,1-Dichloropropene	110		110		70-130	0		20
Bromoform	93		95		70-130	2		20
1,1,2,2-Tetrachloroethane	107		110		70-130	3		20
Benzene	108		107		70-130	1		20
Toluene	101		99		70-130	2		20
Ethylbenzene	101		101		70-130	0		20
Chloromethane	125		124		70-130	1		20
Bromomethane	87		89		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Project Number: 2693

Lab Number: L1825765
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-10 Batch: WG1134832-3 WG1134832-4								
Vinyl chloride	105		105		70-130	0		20
Chloroethane	87		86		70-130	1		20
1,1-Dichloroethene	108		104		70-130	4		20
trans-1,2-Dichloroethene	106		105		70-130	1		20
Trichloroethene	103		103		70-130	0		20
1,2-Dichlorobenzene	96		97		70-130	1		20
1,3-Dichlorobenzene	97		97		70-130	0		20
1,4-Dichlorobenzene	97		96		70-130	1		20
Methyl tert butyl ether	105		106		70-130	1		20
p/m-Xylene	99		97		70-130	2		20
o-Xylene	97		97		70-130	0		20
cis-1,2-Dichloroethene	104		104		70-130	0		20
Dibromomethane	101		102		70-130	1		20
1,2,3-Trichloropropane	107		111		70-130	4		20
Styrene	99		99		70-130	0		20
Dichlorodifluoromethane	106		104		70-130	2		20
Acetone	111		117		70-130	5		20
Carbon disulfide	108		106		70-130	2		20
Methyl ethyl ketone	118		123		70-130	4		20
Methyl isobutyl ketone	111		117		70-130	5		20
2-Hexanone	103		111		70-130	7		20
Bromochloromethane	97		97		70-130	0		20
Tetrahydrofuran	116		124		70-130	7		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-10 Batch: WG1134832-3 WG1134832-4

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
2,2-Dichloropropane	107		104		70-130	3		20
1,2-Dibromoethane	98		100		70-130	2		20
1,3-Dichloropropane	108		109		70-130	1		20
1,1,1,2-Tetrachloroethane	95		94		70-130	1		20
Bromobenzene	96		96		70-130	0		20
n-Butylbenzene	110		110		70-130	0		20
sec-Butylbenzene	106		105		70-130	1		20
tert-Butylbenzene	100		100		70-130	0		20
o-Chlorotoluene	104		104		70-130	0		20
p-Chlorotoluene	106		105		70-130	1		20
1,2-Dibromo-3-chloropropane	91		93		70-130	2		20
Hexachlorobutadiene	98		96		70-130	2		20
Isopropylbenzene	104		103		70-130	1		20
p-Isopropyltoluene	101		101		70-130	0		20
Naphthalene	98		102		70-130	4		20
n-Propylbenzene	108		108		70-130	0		20
1,2,3-Trichlorobenzene	97		96		70-130	1		20
1,2,4-Trichlorobenzene	97		98		70-130	1		20
1,3,5-Trimethylbenzene	103		102		70-130	1		20
1,2,4-Trimethylbenzene	102		102		70-130	0		20
Diethyl ether	110		110		70-130	0		20
Diisopropyl Ether	125		126		70-130	1		20
Ethyl-Tert-Butyl-Ether	110		112		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01-10 Batch: WG1134832-3 WG1134832-4								
Tertiary-Amyl Methyl Ether	103		106		70-130	3		20
1,4-Dioxane	96		103		70-130	7		20
2-Chloroethylvinyl ether	112		116		70-130	4		20
Halothane	103		99		70-130	4		20
Ethyl Acetate	119		126		70-130	6		20
Freon-113	108		106		70-130	2		20
Vinyl acetate	95		101		70-130	6		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	99		100		70-130
Toluene-d8	101		101		70-130
4-Bromofluorobenzene	109		108		70-130
Dibromofluoromethane	91		92		70-130

SEMIVOLATILES

SAMPLE RESULTS

Lab ID: L1825765-01
Client ID: A-1
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 10:30
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8270D
Analytical Date: 07/13/18 03:47
Analyst: PS
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 07/11/18 11:21

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID: L1825765-01

Client ID: A-1

Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 10:30

Date Received: 07/06/18

Field Prep: Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	410	--	1
4-Nitrophenol	ND		ug/kg	270	--	1
2,4-Dinitrophenol	ND		ug/kg	920	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	76		30-130
Phenol-d6	78		30-130
Nitrobenzene-d5	86		30-130
2-Fluorobiphenyl	85		30-130
2,4,6-Tribromophenol	94		30-130
4-Terphenyl-d14	89		30-130

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 11:21
Analytical Date:	07/13/18 04:11		
Analyst:	PS		
Percent Solids:	85%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	160	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1

SAMPLE RESULTS

Lab ID: L1825765-02
Client ID: A-2
Sample Location: ATHLETIC FIELD
Date Collected: 07/06/18 10:20
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	160	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	160	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	160	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	180	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	420	--	1
4-Nitrophenol	ND		ug/kg	270	--	1
2,4-Dinitrophenol	ND		ug/kg	930	--	1
Pentachlorophenol	ND		ug/kg	390	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	68		30-130
Phenol-d6	70		30-130
Nitrobenzene-d5	80		30-130
2-Fluorobiphenyl	78		30-130
2,4,6-Tribromophenol	85		30-130
4-Terphenyl-d14	82		30-130

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 11:21
Analytical Date:	07/13/18 02:59		
Analyst:	PS		
Percent Solids:	88%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	410	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	900	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	66		30-130
Phenol-d6	67		30-130
Nitrobenzene-d5	73		30-130
2-Fluorobiphenyl	69		30-130
2,4,6-Tribromophenol	89		30-130
4-Terphenyl-d14	68		30-130

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 11:21
Analytical Date:	07/13/18 03:23		
Analyst:	PS		
Percent Solids:	93%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	210	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	210	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	210	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
2-Fluorophenol	64		30-130
Phenol-d6	68		30-130
Nitrobenzene-d5	74		30-130
2-Fluorobiphenyl	74		30-130
2,4,6-Tribromophenol	85		30-130
4-Terphenyl-d14	72		30-130

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 11:21
Analytical Date:	07/13/18 02:11		
Analyst:	PS		
Percent Solids:	87%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID: L1825765-05
Client ID: A-5
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:59
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	410	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	900	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

MCP Semivolatile Organics - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	63		30-130
Phenol-d6	62		30-130
Nitrobenzene-d5	67		30-130
2-Fluorobiphenyl	68		30-130
2,4,6-Tribromophenol	75		30-130
4-Terphenyl-d14	69		30-130

SAMPLE RESULTS

Lab ID: L1825765-06
Client ID: A-6
Sample Location: ATHLETIC FIELD

Sample Depth:
Matrix: Soil
Analytical Method: 97,8270D
Analytical Date: 07/13/18 02:35
Analyst: PS
Percent Solids: 89%

Date Collected: 07/06/18 09:55
Date Received: 07/06/18
Field Prep: Not Specified

Extraction Method: EPA 3546
Extraction Date: 07/11/18 11:21

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	400	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	880	--	1
Pentachlorophenol	ND		ug/kg	370	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

MCP Semivolatile Organics - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	70		30-130
Phenol-d6	71		30-130
Nitrobenzene-d5	77		30-130
2-Fluorobiphenyl	74		30-130
2,4,6-Tribromophenol	85		30-130
4-Terphenyl-d14	70		30-130

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 16:24
Analytical Date:	07/12/18 03:44		
Analyst:	EK		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID: L1825765-07
Client ID: A-7
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:56
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	83		30-130
Phenol-d6	85		30-130
Nitrobenzene-d5	84		30-130
2-Fluorobiphenyl	87		30-130
2,4,6-Tribromophenol	71		30-130
4-Terphenyl-d14	83		30-130

SAMPLE RESULTS

Lab ID: L1825765-08
Client ID: A-8
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:55
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8270D
Analytical Date: 07/12/18 03:18
Analyst: EK
Percent Solids: 92%

Extraction Method: EPA 3546
Extraction Date: 07/11/18 16:24

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**

MCP Semivolatile Organics - Westborough Lab

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
2-Fluorophenol	82		30-130
Phenol-d6	82		30-130
Nitrobenzene-d5	81		30-130
2-Fluorobiphenyl	86		30-130
2,4,6-Tribromophenol	72		30-130
4-Terphenyl-d14	88		30-130

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 16:24
Analytical Date:	07/12/18 02:53		
Analyst:	EK		
Percent Solids:	92%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**

MCP Semivolatile Organics - Westborough Lab

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
2-Fluorophenol	75		30-130
Phenol-d6	76		30-130
Nitrobenzene-d5	74		30-130
2-Fluorobiphenyl	81		30-130
2,4,6-Tribromophenol	69		30-130
4-Terphenyl-d14	80		30-130

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	07/11/18 16:24
Analytical Date:	07/12/18 02:28		
Analyst:	EK		
Percent Solids:	94%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	170	--	1
Hexachlorobenzene	ND		ug/kg	100	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	170	--	1
1,2-Dichlorobenzene	ND		ug/kg	170	--	1
1,3-Dichlorobenzene	ND		ug/kg	170	--	1
1,4-Dichlorobenzene	ND		ug/kg	170	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	170	--	1
2,4-Dinitrotoluene	ND		ug/kg	170	--	1
2,6-Dinitrotoluene	ND		ug/kg	170	--	1
Azobenzene	ND		ug/kg	170	--	1
Fluoranthene	ND		ug/kg	100	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	170	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	210	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	170	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	170	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	170	--	1
Butyl benzyl phthalate	ND		ug/kg	170	--	1
Di-n-butylphthalate	ND		ug/kg	170	--	1
Di-n-octylphthalate	ND		ug/kg	170	--	1
Diethyl phthalate	ND		ug/kg	170	--	1
Dimethyl phthalate	ND		ug/kg	170	--	1
Benzo(a)anthracene	ND		ug/kg	100	--	1

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	100	--	1
Benzo(k)fluoranthene	ND		ug/kg	100	--	1
Chrysene	ND		ug/kg	100	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	100	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	170	--	1
Phenanthrene	ND		ug/kg	100	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	100	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	100	--	1
Aniline	ND		ug/kg	210	--	1
4-Chloroaniline	ND		ug/kg	170	--	1
Dibenzofuran	ND		ug/kg	170	--	1
2-Methylnaphthalene	ND		ug/kg	210	--	1
Acetophenone	ND		ug/kg	170	--	1
2,4,6-Trichlorophenol	ND		ug/kg	100	--	1
2-Chlorophenol	ND		ug/kg	170	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	170	--	1
2-Nitrophenol	ND		ug/kg	380	--	1
4-Nitrophenol	ND		ug/kg	240	--	1
2,4-Dinitrophenol	ND		ug/kg	840	--	1
Pentachlorophenol	ND		ug/kg	350	--	1
Phenol	ND		ug/kg	170	--	1
2-Methylphenol	ND		ug/kg	170	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	250	--	1
2,4,5-Trichlorophenol	ND		ug/kg	170	--	1

SAMPLE RESULTS

Lab ID: L1825765-10 Date Collected: 07/06/18 09:30

Client ID: A-10 Date Received: 07/06/18

Sample Location: ATHLETIC FIELD Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	70		30-130
Phenol-d6	78		30-130
Nitrobenzene-d5	74		30-130
2-Fluorobiphenyl	87		30-130
2,4,6-Tribromophenol	78		30-130
4-Terphenyl-d14	92		30-130

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	07/11/18 22:53	Extraction Date:	07/11/18 11:21
Analyst:	EK		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-06 Batch: WG1134589-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	98	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	07/11/18 22:53	Extraction Date:	07/11/18 11:21
Analyst:	EK		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-06 Batch: WG1134589-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	98	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	98	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 07/11/18 22:53
Analyst: EK

Extraction Method: EPA 3546
Extraction Date: 07/11/18 11:21

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-06 Batch: WG1134589-1					
Tentatively Identified Compounds					
No Tentatively Identified Compounds	ND		ug/kg		

Surrogate	**%Recovery**	**Qualifier**	**Acceptance Criteria**
2-Fluorophenol	89		30-130
Phenol-d6	94		30-130
Nitrobenzene-d5	96		30-130
2-Fluorobiphenyl	83		30-130
2,4,6-Tribromophenol	79		30-130
4-Terphenyl-d14	93		30-130

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	07/12/18 01:12	Extraction Date:	07/11/18 16:24
Analyst:	RC		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 07-10 Batch: WG1134687-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	98	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	07/12/18 01:12	Extraction Date:	07/11/18 16:24
Analyst:	RC		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 07-10 Batch: WG1134687-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	98	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	98	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	07/12/18 01:12	Extraction Date:	07/11/18 16:24
Analyst:	RC		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 07-10 Batch: WG1134687-1					
Tentatively Identified Compounds					
No Tentatively Identified Compounds	ND		ug/kg		

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	76		30-130
Phenol-d6	77		30-130
Nitrobenzene-d5	75		30-130
2-Fluorobiphenyl	83		30-130
2,4,6-Tribromophenol	68		30-130
4-Terphenyl-d14	85		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765

Project Number: 2693
Report Date: 07/16/18

MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-06 Batch: WG1134589-2 WG1134589-3

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Acenaphthene	95		82		40-140	15		30
1,2,4-Trichlorobenzene	84		71		40-140	17		30
Hexachlorobenzene	81		73		40-140	10		30
Bis(2-chloroethyl)ether	102		86		40-140	17		30
2-Chloronaphthalene	87		75		40-140	15		30
1,2-Dichlorobenzene	86		73		40-140	16		30
1,3-Dichlorobenzene	84		71		40-140	17		30
1,4-Dichlorobenzene	84		71		40-140	17		30
3,3'-Dichlorobenzidine	72		65		40-140	10		30
2,4-Dinitrotoluene	100		89		40-140	12		30
2,6-Dinitrotoluene	107		94		40-140	13		30
Azobenzene	111		98		40-140	12		30
Fluoranthene	93		83		40-140	11		30
4-Bromophenyl phenyl ether	90		80		40-140	12		30
Bis(2-chloroisopropyl)ether	122		105		40-140	15		30
Bis(2-chloroethoxy)methane	105		88		40-140	18		30
Hexachlorobutadiene	79		69		40-140	14		30
Hexachloroethane	90		75		40-140	18		30
Isophorone	105		88		40-140	18		30
Naphthalene	88		76		40-140	15		30
Nitrobenzene	110		94		40-140	16		30
Bis(2-ethylhexyl)phthalate	113		101		40-140	11		30
Butyl benzyl phthalate	112		100		40-140	11		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.

Project Number: 2693

Lab Number: L1825765

Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-06 Batch: WG1134589-2 WG1134589-3								
Di-n-butylphthalate	103		91		40-140	12		30
Di-n-octylphthalate	116		105		40-140	10		30
Diethyl phthalate	97		87		40-140	11		30
Dimethyl phthalate	90		79		40-140	13		30
Benzo(a)anthracene	91		84		40-140	8		30
Benzo(a)pyrene	95		86		40-140	10		30
Benzo(b)fluoranthene	94		85		40-140	10		30
Benzo(k)fluoranthene	92		84		40-140	9		30
Chrysene	92		84		40-140	9		30
Acenaphthylene	94		80		40-140	16		30
Anthracene	96		85		40-140	12		30
Benzo(ghi)perylene	90		81		40-140	11		30
Fluorene	95		84		40-140	12		30
Phenanthrene	95		83		40-140	13		30
Dibenzo(a,h)anthracene	89		79		40-140	12		30
Indeno(1,2,3-cd)pyrene	91		81		40-140	12		30
Pyrene	92		83		40-140	10		30
Aniline	75		61		40-140	21		30
4-Chloroaniline	89		74		40-140	18		30
Dibenzofuran	90		80		40-140	12		30
2-Methylnaphthalene	93		81		40-140	14		30
Acetophenone	100		84		40-140	17		30
2,4,6-Trichlorophenol	92		79		30-130	15		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.

Project Number: 2693

Lab Number: L1825765

Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-06 Batch: WG1134589-2 WG1134589-3								
2-Chlorophenol	97		83		30-130	16		30
2,4-Dichlorophenol	97		81		30-130	18		30
2,4-Dimethylphenol	106		90		30-130	16		30
2-Nitrophenol	119		101		30-130	16		30
4-Nitrophenol	115		101		30-130	13		30
2,4-Dinitrophenol	83		66		30-130	23		30
Pentachlorophenol	58		50		30-130	15		30
Phenol	103		85		30-130	19		30
2-Methylphenol	104		87		30-130	18		30
3-Methylphenol/4-Methylphenol	112		94		30-130	17		30
2,4,5-Trichlorophenol	90		79		30-130	13		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	105		87		30-130
Phenol-d6	110		92		30-130
Nitrobenzene-d5	116		98		30-130
2-Fluorobiphenyl	94		80		30-130
2,4,6-Tribromophenol	96		87		30-130
4-Terphenyl-d14	104		91		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 07-10 Batch: WG1134687-2 WG1134687-3								
Acenaphthene	78		74		40-140	5		30
1,2,4-Trichlorobenzene	82		78		40-140	5		30
Hexachlorobenzene	76		68		40-140	11		30
Bis(2-chloroethyl)ether	79		75		40-140	5		30
2-Chloronaphthalene	79		76		40-140	4		30
1,2-Dichlorobenzene	78		77		40-140	1		30
1,3-Dichlorobenzene	74		73		40-140	1		30
1,4-Dichlorobenzene	75		74		40-140	1		30
3,3'-Dichlorobenzidine	56		52		40-140	7		30
2,4-Dinitrotoluene	79		73		40-140	8		30
2,6-Dinitrotoluene	82		76		40-140	8		30
Azobenzene	83		78		40-140	6		30
Fluoranthene	78		72		40-140	8		30
4-Bromophenyl phenyl ether	81		75		40-140	8		30
Bis(2-chloroisopropyl)ether	98		93		40-140	5		30
Bis(2-chloroethoxy)methane	84		77		40-140	9		30
Hexachlorobutadiene	80		78		40-140	3		30
Hexachloroethane	78		77		40-140	1		30
Isophorone	88		80		40-140	10		30
Naphthalene	76		75		40-140	1		30
Nitrobenzene	83		78		40-140	6		30
Bis(2-ethylhexyl)phthalate	94		84		40-140	11		30
Butyl benzyl phthalate	82		75		40-140	9		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 07-10 Batch: WG1134687-2 WG1134687-3								
Di-n-butylphthalate	85		78		40-140	9		30
Di-n-octylphthalate	93		86		40-140	8		30
Diethyl phthalate	81		74		40-140	9		30
Dimethyl phthalate	83		76		40-140	9		30
Benzo(a)anthracene	82		75		40-140	9		30
Benzo(a)pyrene	73		68		40-140	7		30
Benzo(b)fluoranthene	72		68		40-140	6		30
Benzo(k)fluoranthene	78		71		40-140	9		30
Chrysene	82		75		40-140	9		30
Acenaphthylene	82		77		40-140	6		30
Anthracene	81		76		40-140	6		30
Benzo(ghi)perylene	76		71		40-140	7		30
Fluorene	78		72		40-140	8		30
Phenanthrene	79		74		40-140	7		30
Dibenzo(a,h)anthracene	78		74		40-140	5		30
Indeno(1,2,3-cd)pyrene	77		73		40-140	5		30
Pyrene	77		71		40-140	8		30
Aniline	54		49		40-140	10		30
4-Chloroaniline	71		58		40-140	20		30
Dibenzofuran	77		74		40-140	4		30
2-Methylnaphthalene	80		76		40-140	5		30
Acetophenone	83		77		40-140	8		30
2,4,6-Trichlorophenol	83		77		30-130	8		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Project Number: 2693

Lab Number: L1825765
Report Date: 07/16/18

MCP Semivolatile Organics - Westborough Lab Associated sample(s): 07-10 Batch: WG1134687-2 WG1134687-3

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
2-Chlorophenol	82		77		30-130	6		30
2,4-Dichlorophenol	87		80		30-130	8		30
2,4-Dimethylphenol	88		80		30-130	10		30
2-Nitrophenol	85		80		30-130	6		30
4-Nitrophenol	76		69		30-130	10		30
2,4-Dinitrophenol	60		55		30-130	9		30
Pentachlorophenol	55		50		30-130	10		30
Phenol	83		78		30-130	6		30
2-Methylphenol	85		79		30-130	7		30
3-Methylphenol/4-Methylphenol	82		75		30-130	9		30
2,4,5-Trichlorophenol	81		74		30-130	9		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	76		73		30-130
Phenol-d6	79		73		30-130
Nitrobenzene-d5	79		73		30-130
2-Fluorobiphenyl	79		73		30-130
2,4,6-Tribromophenol	66		60		30-130
4-Terphenyl-d14	78		72		30-130

PETROLEUM HYDROCARBONS

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 12:59
Analytical Date:	07/12/18 20:54		
Analyst:	LL		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	37100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	84		40-140

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 12:59
Analytical Date:	07/12/18 21:25		
Analyst:	LL		
Percent Solids:	85%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	40500		ug/kg	37800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	87		40-140

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 12:59
Analytical Date:	07/12/18 20:22		
Analyst:	LL		
Percent Solids:	88%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	37100	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	94		40-140

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 12:59
Analytical Date:	07/12/18 21:57		
Analyst:	LL		
Percent Solids:	93%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	34300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	93		40-140

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 12:59
Analytical Date:	07/12/18 19:50		
Analyst:	LL		
Percent Solids:	87%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	36800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	95		40-140

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 12:59
Analytical Date:	07/12/18 19:18		
Analyst:	LL		
Percent Solids:	89%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	35300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	88		40-140

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 15:33
Analytical Date:	07/12/18 09:41		
Analyst:	MEO		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	35900	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	86		40-140

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 15:33
Analytical Date:	07/12/18 10:13		
Analyst:	MEO		
Percent Solids:	92%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	34800	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	88		40-140

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 15:33
Analytical Date:	07/12/18 16:38		
Analyst:	LL		
Percent Solids:	92%		

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	34900	--	1

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**
o-Terphenyl	72		40-140

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015D(M)	Extraction Date:	07/11/18 15:33
Analytical Date:	07/12/18 17:10		
Analyst:	LL		
Percent Solids:	94%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	34600	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	73		40-140

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	1,8015D(M)	Extraction Method:	EPA 3546
Analytical Date:	07/11/18 17:11	Extraction Date:	07/11/18 05:47
Analyst:	LL		

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 07-10 Batch: WG1134437-1					
TPH	ND		ug/kg	32400	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	85		40-140

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	1,8015D(M)	Extraction Method:	EPA 3546
Analytical Date:	07/12/18 17:10	Extraction Date:	07/11/18 12:59
Analyst:	LL		

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-06 Batch: WG1134625-1					
TPH	ND		ug/kg	32100	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	81		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 07-10 Batch: WG1134437-2								
TPH	78		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	68				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.

Project Number: 2693

Lab Number: L1825765

Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-06 Batch: WG1134625-2								
TPH	70		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	72				40-140

PCBS

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/11/18 07:33
Analytical Date:	07/15/18 23:37	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	07/12/18
Percent Solids:	86%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.8	--	1	A
Aroclor 1221	ND		ug/kg	37.8	--	1	A
Aroclor 1232	ND		ug/kg	37.8	--	1	A
Aroclor 1242	ND		ug/kg	37.8	--	1	A
Aroclor 1248	ND		ug/kg	37.8	--	1	A
Aroclor 1254	ND		ug/kg	37.8	--	1	A
Aroclor 1260	ND		ug/kg	37.8	--	1	A
Aroclor 1262	ND		ug/kg	37.8	--	1	A
Aroclor 1268	ND		ug/kg	37.8	--	1	A
PCBs, Total	ND		ug/kg	37.8	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		30-150	A
Decachlorobiphenyl	65		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		30-150	B
Decachlorobiphenyl	69		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/11/18 07:33
Analytical Date:	07/15/18 23:49	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	07/12/18
Percent Solids:	85%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.2	--	1	A
Aroclor 1221	ND		ug/kg	37.2	--	1	A
Aroclor 1232	ND		ug/kg	37.2	--	1	A
Aroclor 1242	ND		ug/kg	37.2	--	1	A
Aroclor 1248	ND		ug/kg	37.2	--	1	A
Aroclor 1254	ND		ug/kg	37.2	--	1	A
Aroclor 1260	ND		ug/kg	37.2	--	1	A
Aroclor 1262	ND		ug/kg	37.2	--	1	A
Aroclor 1268	ND		ug/kg	37.2	--	1	A
PCBs, Total	ND		ug/kg	37.2	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	62		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		30-150	B
Decachlorobiphenyl	67		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/11/18 07:33
Analytical Date:	07/16/18 00:02	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	07/12/18
Percent Solids:	88%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.5	--	1	A
Aroclor 1221	ND		ug/kg	36.5	--	1	A
Aroclor 1232	ND		ug/kg	36.5	--	1	A
Aroclor 1242	ND		ug/kg	36.5	--	1	A
Aroclor 1248	ND		ug/kg	36.5	--	1	A
Aroclor 1254	ND		ug/kg	36.5	--	1	A
Aroclor 1260	ND		ug/kg	36.5	--	1	A
Aroclor 1262	ND		ug/kg	36.5	--	1	A
Aroclor 1268	ND		ug/kg	36.5	--	1	A
PCBs, Total	ND		ug/kg	36.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	65		30-150	A
2,4,5,6-Tetrachloro-m-xylene	79		30-150	B
Decachlorobiphenyl	72		30-150	B

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/11/18 07:33
Analytical Date:	07/16/18 00:14	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	07/12/18
Percent Solids:	93%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**	**Column**
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.1	--	1	A
Aroclor 1221	ND		ug/kg	35.1	--	1	A
Aroclor 1232	ND		ug/kg	35.1	--	1	A
Aroclor 1242	ND		ug/kg	35.1	--	1	A
Aroclor 1248	ND		ug/kg	35.1	--	1	A
Aroclor 1254	ND		ug/kg	35.1	--	1	A
Aroclor 1260	ND		ug/kg	35.1	--	1	A
Aroclor 1262	ND		ug/kg	35.1	--	1	A
Aroclor 1268	ND		ug/kg	35.1	--	1	A
PCBs, Total	ND		ug/kg	35.1	--	1	A

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**	**Column**
2,4,5,6-Tetrachloro-m-xylene	84		30-150	A
Decachlorobiphenyl	73		30-150	A
2,4,5,6-Tetrachloro-m-xylene	82		30-150	B
Decachlorobiphenyl	74		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/11/18 07:33
Analytical Date:	07/16/18 00:26	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	07/12/18
Percent Solids:	87%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**	**Column**
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.5	--	1	A
Aroclor 1221	ND		ug/kg	36.5	--	1	A
Aroclor 1232	ND		ug/kg	36.5	--	1	A
Aroclor 1242	ND		ug/kg	36.5	--	1	A
Aroclor 1248	ND		ug/kg	36.5	--	1	A
Aroclor 1254	ND		ug/kg	36.5	--	1	A
Aroclor 1260	ND		ug/kg	36.5	--	1	A
Aroclor 1262	ND		ug/kg	36.5	--	1	A
Aroclor 1268	ND		ug/kg	36.5	--	1	A
PCBs, Total	ND		ug/kg	36.5	--	1	A

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**	**Column**
2,4,5,6-Tetrachloro-m-xylene	83		30-150	A
Decachlorobiphenyl	70		30-150	A
2,4,5,6-Tetrachloro-m-xylene	83		30-150	B
Decachlorobiphenyl	78		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-06	Date Collected:	07/06/18 09:55
Client ID:	A-6	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/11/18 07:33
Analytical Date:	07/16/18 00:39	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	07/12/18
Percent Solids:	89%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.0	--	1	A
Aroclor 1221	ND		ug/kg	37.0	--	1	A
Aroclor 1232	ND		ug/kg	37.0	--	1	A
Aroclor 1242	ND		ug/kg	37.0	--	1	A
Aroclor 1248	ND		ug/kg	37.0	--	1	A
Aroclor 1254	ND		ug/kg	37.0	--	1	A
Aroclor 1260	ND		ug/kg	37.0	--	1	A
Aroclor 1262	ND		ug/kg	37.0	--	1	A
Aroclor 1268	ND		ug/kg	37.0	--	1	A
PCBs, Total	ND		ug/kg	37.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	89		30-150	A
Decachlorobiphenyl	76		30-150	A
2,4,5,6-Tetrachloro-m-xylene	86		30-150	B
Decachlorobiphenyl	82		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/12/18 08:23
Analytical Date:	07/16/18 11:59	Cleanup Method:	EPA 3665A
Analyst:	HT	Cleanup Date:	07/12/18
Percent Solids:	91%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	**Result**	**Qualifier**	**Units**	**RL**	**MDL**	**Dilution Factor**	**Column**
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	34.8	--	1	A
Aroclor 1221	ND		ug/kg	34.8	--	1	A
Aroclor 1232	ND		ug/kg	34.8	--	1	A
Aroclor 1242	ND		ug/kg	34.8	--	1	A
Aroclor 1248	ND		ug/kg	34.8	--	1	A
Aroclor 1254	ND		ug/kg	34.8	--	1	A
Aroclor 1260	ND		ug/kg	34.8	--	1	A
Aroclor 1262	ND		ug/kg	34.8	--	1	A
Aroclor 1268	ND		ug/kg	34.8	--	1	A
PCBs, Total	ND		ug/kg	34.8	--	1	A

Surrogate	**% Recovery**	**Qualifier**	**Acceptance Criteria**	**Column**
2,4,5,6-Tetrachloro-m-xylene	81		30-150	A
Decachlorobiphenyl	41		30-150	A
2,4,5,6-Tetrachloro-m-xylene	76		30-150	B
Decachlorobiphenyl	51		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/12/18 08:23
Analytical Date:	07/16/18 12:11	Cleanup Method:	EPA 3665A
Analyst:	HT	Cleanup Date:	07/12/18
Percent Solids:	92%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.1	--	1	A
Aroclor 1221	ND		ug/kg	35.1	--	1	A
Aroclor 1232	ND		ug/kg	35.1	--	1	A
Aroclor 1242	ND		ug/kg	35.1	--	1	A
Aroclor 1248	ND		ug/kg	35.1	--	1	A
Aroclor 1254	ND		ug/kg	35.1	--	1	A
Aroclor 1260	ND		ug/kg	35.1	--	1	A
Aroclor 1262	ND		ug/kg	35.1	--	1	A
Aroclor 1268	ND		ug/kg	35.1	--	1	A
PCBs, Total	ND		ug/kg	35.1	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	92		30-150	A
Decachlorobiphenyl	46		30-150	A
2,4,5,6-Tetrachloro-m-xylene	87		30-150	B
Decachlorobiphenyl	55		30-150	B

SAMPLE RESULTS

Lab ID: L1825765-09
Client ID: A-9
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 09:50
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 07/16/18 12:23
Analyst: HT
Percent Solids: 92%

Extraction Method: EPA 3546
Extraction Date: 07/12/18 08:23
Cleanup Method: EPA 3665A
Cleanup Date: 07/12/18
Cleanup Method: EPA 3660B
Cleanup Date: 07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.5	--	1	A
Aroclor 1221	ND		ug/kg	35.5	--	1	A
Aroclor 1232	ND		ug/kg	35.5	--	1	A
Aroclor 1242	ND		ug/kg	35.5	--	1	A
Aroclor 1248	ND		ug/kg	35.5	--	1	A
Aroclor 1254	ND		ug/kg	35.5	--	1	A
Aroclor 1260	ND		ug/kg	35.5	--	1	A
Aroclor 1262	ND		ug/kg	35.5	--	1	A
Aroclor 1268	ND		ug/kg	35.5	--	1	A
PCBs, Total	ND		ug/kg	35.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		30-150	A
Decachlorobiphenyl	45		30-150	A
2,4,5,6-Tetrachloro-m-xylene	77		30-150	B
Decachlorobiphenyl	54		30-150	B

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	07/12/18 08:23
Analytical Date:	07/16/18 12:36	Cleanup Method:	EPA 3665A
Analyst:	HT	Cleanup Date:	07/12/18
Percent Solids:	94%	Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	83.1	--	1	A
Aroclor 1221	ND		ug/kg	83.1	--	1	A
Aroclor 1232	ND		ug/kg	83.1	--	1	A
Aroclor 1242	ND		ug/kg	83.1	--	1	A
Aroclor 1248	ND		ug/kg	83.1	--	1	A
Aroclor 1254	ND		ug/kg	83.1	--	1	A
Aroclor 1260	ND		ug/kg	83.1	--	1	A
Aroclor 1262	ND		ug/kg	83.1	--	1	A
Aroclor 1268	ND		ug/kg	83.1	--	1	A
PCBs, Total	ND		ug/kg	83.1	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	99		30-150	A
Decachlorobiphenyl	53		30-150	A
2,4,5,6-Tetrachloro-m-xylene	89		30-150	B
Decachlorobiphenyl	62		30-150	B

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8082A	Extraction Method:	EPA 3546
Analytical Date:	07/16/18 03:07	Extraction Date:	07/11/18 07:33
Analyst:	JW	Cleanup Method:	EPA 3665A
		Cleanup Date:	07/12/18
		Cleanup Method:	EPA 3660B
		Cleanup Date:	07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-06 Batch: WG1134462-1						
Aroclor 1016	ND		ug/kg	32.5	--	A
Aroclor 1221	ND		ug/kg	32.5	--	A
Aroclor 1232	ND		ug/kg	32.5	--	A
Aroclor 1242	ND		ug/kg	32.5	--	A
Aroclor 1248	ND		ug/kg	32.5	--	A
Aroclor 1254	ND		ug/kg	32.5	--	A
Aroclor 1260	ND		ug/kg	32.5	--	A
Aroclor 1262	ND		ug/kg	32.5	--	A
Aroclor 1268	ND		ug/kg	32.5	--	A
PCBs, Total	ND		ug/kg	32.5	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		30-150	A
Decachlorobiphenyl	72		30-150	A
2,4,5,6-Tetrachloro-m-xylene	75		30-150	B
Decachlorobiphenyl	72		30-150	B

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 07/12/18 11:56
Analyst: WR

Extraction Method: EPA 3546
Extraction Date: 07/11/18 21:38
Cleanup Method: EPA 3665A
Cleanup Date: 07/12/18
Cleanup Method: EPA 3660B
Cleanup Date: 07/12/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 07-10 Batch: WG1134749-1						
Aroclor 1016	ND		ug/kg	32.4	--	A
Aroclor 1221	ND		ug/kg	32.4	--	A
Aroclor 1232	ND		ug/kg	32.4	--	A
Aroclor 1242	ND		ug/kg	32.4	--	A
Aroclor 1248	ND		ug/kg	32.4	--	A
Aroclor 1254	ND		ug/kg	32.4	--	A
Aroclor 1260	ND		ug/kg	32.4	--	A
Aroclor 1262	ND		ug/kg	32.4	--	A
Aroclor 1268	ND		ug/kg	32.4	--	A
PCBs, Total	ND		ug/kg	32.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	110		30-150	A
Decachlorobiphenyl	109		30-150	A
2,4,5,6-Tetrachloro-m-xylene	112		30-150	B
Decachlorobiphenyl	132		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SO HS.
Project Number: 2693

Lab Number: L1825765
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-06 Batch: WG1134462-2 WG1134462-3									
Aroclor 1016	89		89		40-140	0		30	A
Aroclor 1260	81		85		40-140	5		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	81		85		30-150	A
Decachlorobiphenyl	66		77		30-150	A
2,4,5,6-Tetrachloro-m-xylene	75		73		30-150	B
Decachlorobiphenyl	73		75		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SO HS. **Lab Number:** L1825765
Project Number: 2693 **Report Date:** 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 07-10 Batch: WG1134749-2 WG1134749-3									
Aroclor 1016	95		98		40-140	3		30	A
Aroclor 1260	86		91		40-140	6		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	109		106		30-150	A
Decachlorobiphenyl	103		104		30-150	A
2,4,5,6-Tetrachloro-m-xylene	103		107		30-150	B
Decachlorobiphenyl	112		121		30-150	B

METALS

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-01	Date Collected:	07/06/18 10:30
Client ID:	A-1	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 86%

MCP Total Metals - Mansfield Lab

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Antimony, Total	ND		mg/kg	2.26	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Arsenic, Total	37.3		mg/kg	0.451	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Barium, Total	43.0		mg/kg	0.451	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Beryllium, Total	0.817		mg/kg	0.226	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.451	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Chromium, Total	31.4		mg/kg	0.451	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Lead, Total	7.18		mg/kg	2.26	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.073	--	1	07/11/18 07:00	07/11/18 12:34	EPA 7471B	97,7471B	MG
Nickel, Total	17.8		mg/kg	1.13	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.26	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.451	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.26	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Vanadium, Total	23.4		mg/kg	0.451	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE
Zinc, Total	26.9		mg/kg	2.26	--	1	07/10/18 16:40	07/12/18 08:27	EPA 3050B	97,6010D	PE

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-02	Date Collected:	07/06/18 10:20
Client ID:	A-2	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	85%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.21	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Arsenic, Total	40.5		mg/kg	0.442	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Barium, Total	51.8		mg/kg	0.442	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Beryllium, Total	1.22		mg/kg	0.221	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.442	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Chromium, Total	32.4		mg/kg	0.442	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Lead, Total	7.23		mg/kg	2.21	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.074	--	1	07/11/18 07:00	07/11/18 12:36	EPA 7471B	97,7471B	MG
Nickel, Total	19.0		mg/kg	1.11	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.21	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.442	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.21	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Vanadium, Total	23.4		mg/kg	0.442	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE
Zinc, Total	26.8		mg/kg	2.21	--	1	07/10/18 16:40	07/12/18 08:31	EPA 3050B	97,6010D	PE

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

SAMPLE RESULTS

Lab ID: L1825765-03
Client ID: A-3
Sample Location: ATHLETIC FIELD
Date Collected: 07/06/18 10:10
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Arsenic, Total	28.6		mg/kg	0.426	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Barium, Total	37.7		mg/kg	0.426	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Beryllium, Total	0.656		mg/kg	0.213	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.426	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Chromium, Total	25.6		mg/kg	0.426	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Lead, Total	6.97		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.071	--	1	07/11/18 07:00	07/11/18 12:41	EPA 7471B	97,7471B	MG
Nickel, Total	14.6		mg/kg	1.06	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.426	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Vanadium, Total	19.8		mg/kg	0.426	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE
Zinc, Total	23.4		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:36	EPA 3050B	97,6010D	PE

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-04	Date Collected:	07/06/18 10:00
Client ID:	A-4	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 93%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Arsenic, Total	34.7		mg/kg	0.420	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Barium, Total	35.9		mg/kg	0.420	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Beryllium, Total	0.742		mg/kg	0.210	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.420	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Chromium, Total	29.8		mg/kg	0.420	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Lead, Total	9.16		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.069	--	1	07/11/18 07:00	07/11/18 12:43	EPA 7471B	97,7471B	MG
Nickel, Total	15.4		mg/kg	1.05	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.420	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Vanadium, Total	23.7		mg/kg	0.420	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE
Zinc, Total	26.8		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:40	EPA 3050B	97,6010D	PE

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.18	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Arsenic, Total	27.9		mg/kg	0.435	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Barium, Total	83.5		mg/kg	0.435	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Beryllium, Total	0.722		mg/kg	0.218	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.435	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Chromium, Total	46.1		mg/kg	0.435	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Lead, Total	4.01		mg/kg	2.18	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.072	--	1	07/11/18 07:00	07/11/18 12:45	EPA 7471B	97,7471B	MG
Nickel, Total	26.8		mg/kg	1.09	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.18	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.435	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.18	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Vanadium, Total	38.2		mg/kg	0.435	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE
Zinc, Total	34.8		mg/kg	2.18	--	1	07/10/18 16:40	07/12/18 08:44	EPA 3050B	97,6010D	PE

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

SAMPLE RESULTS

Lab ID: L1825765-06
Date Collected: 07/06/18 09:55
Client ID: A-6
Date Received: 07/06/18
Sample Location: ATHLETIC FIELD
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Arsenic, Total	32.0		mg/kg	0.427	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Barium, Total	40.9		mg/kg	0.427	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Beryllium, Total	0.892		mg/kg	0.213	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.427	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Chromium, Total	32.6		mg/kg	0.427	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Lead, Total	4.06		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.071	--	1	07/11/18 07:00	07/11/18 12:47	EPA 7471B	97,7471B	MG
Nickel, Total	18.6		mg/kg	1.07	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.427	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Vanadium, Total	22.4		mg/kg	0.427	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE
Zinc, Total	21.8		mg/kg	2.13	--	1	07/10/18 16:40	07/12/18 08:49	EPA 3050B	97,6010D	PE

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Arsenic, Total	31.0		mg/kg	0.421	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Barium, Total	42.4		mg/kg	0.421	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Beryllium, Total	1.05		mg/kg	0.210	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.421	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Chromium, Total	24.8		mg/kg	0.421	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Lead, Total	3.29		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Mercury, Total	ND		mg/kg	0.069	--	1	07/11/18 07:00	07/11/18 12:49	EPA 7471B	97,7471B	MG
Nickel, Total	15.8		mg/kg	1.05	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Selenium, Total	ND		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Silver, Total	ND		mg/kg	0.421	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Thallium, Total	ND		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Vanadium, Total	16.5		mg/kg	0.421	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE
Zinc, Total	18.8		mg/kg	2.10	--	1	07/10/18 16:40	07/12/18 08:53	EPA 3050B	97,6010D	PE

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.09	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Arsenic, Total	26.4		mg/kg	0.419	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Barium, Total	53.3		mg/kg	0.419	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Beryllium, Total	0.754		mg/kg	0.209	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Cadmium, Total	ND		mg/kg	0.419	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Chromium, Total	33.3		mg/kg	0.419	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Lead, Total	3.10		mg/kg	2.09	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Mercury, Total	ND		mg/kg	0.068	--	1	07/11/18 07:00	07/11/18 12:50	EPA 7471B	97,7471B	MG
Nickel, Total	15.6		mg/kg	1.05	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Selenium, Total	ND		mg/kg	2.09	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Silver, Total	ND		mg/kg	0.419	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Thallium, Total	ND		mg/kg	2.09	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Vanadium, Total	18.3		mg/kg	0.419	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC
Zinc, Total	20.7		mg/kg	2.09	--	1	07/10/18 16:40	07/12/18 11:43	EPA 3050B	97,6010D	LC

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Percent Solids:	92%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.04	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Arsenic, Total	28.5		mg/kg	0.408	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Barium, Total	45.4		mg/kg	0.408	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Beryllium, Total	0.917		mg/kg	0.204	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Cadmium, Total	ND		mg/kg	0.408	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Chromium, Total	26.2		mg/kg	0.408	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Lead, Total	3.92		mg/kg	2.04	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Mercury, Total	ND		mg/kg	0.068	--	1	07/11/18 07:00	07/11/18 12:52	EPA 7471B	97,7471B	MG
Nickel, Total	15.9		mg/kg	1.02	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Selenium, Total	ND		mg/kg	2.04	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Silver, Total	ND		mg/kg	0.408	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Thallium, Total	ND		mg/kg	2.04	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Vanadium, Total	17.7		mg/kg	0.408	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC
Zinc, Total	20.2		mg/kg	2.04	--	1	07/10/18 16:40	07/12/18 11:47	EPA 3050B	97,6010D	LC

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-10	Date Collected:	07/06/18 09:30
Client ID:	A-10	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 94%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Arsenic, Total	41.5		mg/kg	0.399	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Barium, Total	37.2		mg/kg	0.399	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Beryllium, Total	0.759		mg/kg	0.200	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Cadmium, Total	ND		mg/kg	0.399	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Chromium, Total	24.8		mg/kg	0.399	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Lead, Total	3.69		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Mercury, Total	ND		mg/kg	0.067	--	1	07/11/18 07:00	07/11/18 12:54	EPA 7471B	97,7471B	MG
Nickel, Total	16.7		mg/kg	0.998	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Selenium, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Silver, Total	ND		mg/kg	0.399	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Thallium, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Vanadium, Total	16.4		mg/kg	0.399	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC
Zinc, Total	21.6		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 11:51	EPA 3050B	97,6010D	LC

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-10 Batch: WG1134263-1										
Antimony, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Arsenic, Total	ND		mg/kg	0.400	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Barium, Total	ND		mg/kg	0.400	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Beryllium, Total	ND		mg/kg	0.200	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Cadmium, Total	ND		mg/kg	0.400	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Chromium, Total	ND		mg/kg	0.400	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Lead, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Nickel, Total	ND		mg/kg	1.00	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Selenium, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Silver, Total	ND		mg/kg	0.400	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Thallium, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Vanadium, Total	ND		mg/kg	0.400	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE
Zinc, Total	ND		mg/kg	2.00	--	1	07/10/18 16:40	07/12/18 07:00	97,6010D	PE

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-10 Batch: WG1134425-1										
Mercury, Total	ND		mg/kg	0.083	--	1	07/11/18 07:00	07/11/18 12:12	97,7471B	MG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis
Batch Quality Control

Project Name: WORC SO HS.
Lab Number: L1825765
Project Number: 2693
Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-10 Batch: WG1134263-2 WG1134263-3 SRM Lot Number: D098-540								
Antimony, Total	144		142		6-194	1		30
Arsenic, Total	94		93		83-117	1		30
Barium, Total	87		88		82-118	1		30
Beryllium, Total	90		89		83-117	1		30
Cadmium, Total	91		94		82-117	3		30
Chromium, Total	87		86		83-119	1		30
Lead, Total	85		85		82-117	0		30
Nickel, Total	90		89		82-117	1		30
Selenium, Total	95		96		78-121	1		30
Silver, Total	96		94		80-120	2		30
Thallium, Total	89		92		80-119	3		30
Vanadium, Total	88		86		79-121	2		30
Zinc, Total	88		88		81-119	0		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-10 Batch: WG1134425-2 WG1134425-3 SRM Lot Number: D098-540								
Mercury, Total	105		98		50-149	7		30

INORGANICS
&
MISCELLANEOUS

SAMPLE RESULTS

Lab ID: L1825765-01
Client ID: A-1
Sample Location: ATHLETIC FIELD

Date Collected: 07/06/18 10:30
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	86.2		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1825765-02
Client ID: A-2
Sample Location: ATHLETIC FIELD
Date Collected: 07/06/18 10:20
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	85.2		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-03	Date Collected:	07/06/18 10:10
Client ID:	A-3	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	88.0		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1825765-04
Client ID: A-4
Sample Location: ATHLETIC FIELD
Date Collected: 07/06/18 10:00
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	92.6		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

Project Name:	WORC SO HS.	**Lab Number:**	L1825765
Project Number:	2693	**Report Date:**	07/16/18

SAMPLE RESULTS

Lab ID:	L1825765-05	Date Collected:	07/06/18 09:59
Client ID:	A-5	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	87.2		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

SAMPLE RESULTS

Lab ID: L1825765-06
Client ID: A-6
Sample Location: ATHLETIC FIELD
Date Collected: 07/06/18 09:55
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	89.4		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

SAMPLE RESULTS

Lab ID:	L1825765-07	Date Collected:	07/06/18 09:56
Client ID:	A-7	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	91.4		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

SAMPLE RESULTS

Lab ID:	L1825765-08	Date Collected:	07/06/18 09:55
Client ID:	A-8	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	91.6		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

SAMPLE RESULTS

Lab ID:	L1825765-09	Date Collected:	07/06/18 09:50
Client ID:	A-9	Date Received:	07/06/18
Sample Location:	ATHLETIC FIELD	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	92.0		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

Project Name: WORC SO HS.

Project Number: 2693

Lab Number: L1825765

Report Date: 07/16/18

SAMPLE RESULTS

Lab ID: L1825765-10
Client ID: A-10
Sample Location: ATHLETIC FIELD
Date Collected: 07/06/18 09:30
Date Received: 07/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	ND		umhos/cm	10	--	1	-	07/07/18 06:00	1,9050A	MA
Solids, Total	94.3		%	0.100	NA	1	-	07/07/18 11:27	121,2540G	RI

Lab Control Sample Analysis

Batch Quality Control

Project Name: WORC SO HS.

Project Number: 2693

Lab Number: L1825765

Report Date: 07/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-10 Batch: WG1133348-1								
Specific Conductance	100		-		99-101	-		

Lab Duplicate Analysis

Batch Quality Control

Project Name: WORC SO HS.
Project Number: 2693

Lab Number: L1825765
Report Date: 07/16/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-10 QC Batch ID: WG1133348-2 QC Sample: L1825765-01 Client ID: A-1						
Specific Conductance @ 25 C	ND	ND	umhos/cm	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-10 QC Batch ID: WG1133415-1 QC Sample: L1825765-01 Client ID: A-1						
Solids, Total	86.2	88.2	%	2		20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1825765-01A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-01B	Plastic 2oz unpreserved for TS	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-01C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-02A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-02B	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-02C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-03A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-03B	Plastic 2oz unpreserved for TS	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-03C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-04A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1825765-04B	Plastic 2oz unpreserved for TS	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-04C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-05A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-05B	Plastic 2oz unpreserved for TS	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-05C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-06A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-06B	Plastic 2oz unpreserved for TS	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-06C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-07A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-07B	Glass 60ml unpreserved split	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-07C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-08A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1825765-08B	Glass 60ml unpreserved split	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-08C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-09A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-09B	Glass 60ml unpreserved split	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-09C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)
L1825765-10A	Vial MeOH preserved	A	NA		23.3	Y	Absent		MCP-8260H-10(14)
L1825765-10B	Glass 60ml unpreserved split	A	NA		23.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L1825765-10C	Glass 120ml/4oz unpreserved	A	NA		23.3	Y	Absent		MCP-8082-10(365),MCP-8270-10(14),TS(7),TPH-DRO-D(14),COND-9050(28)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

ALPHA ANALYTICAL

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 7/6/18

ALPHA Job #: L1825765

Client Information

Client: LORD ASSOC. INC.
Address: 1506 PROV HGWY, STE 30
NORWOOD, MA.
Phone: 781-255-5554
Email: RTella@LORDENV.com

Project Information

Project Name: WORC SO H.S.
Project Location: ATHLETIC FIELD
Project #: 2693
Project Manager: RALPH
ALPHA Quote #: JOE FOLEY / DAVE SANFORD

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due:

Additional Project Information:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods
☐ Yes ☑ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program ______ Criteria ______

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	Com-97 + MCP14 Metals						Sample Comments	TOTAL # BOTTLES
2576501	A-1	7/6/18	10:30	S	RT									X							3
.02	A-2	↓	10:20	↓	↓									↓							3
.03	A-3	↓	10:10	↓	↓									↓							3
.04	A-4	↓	10:00	↓	↓									↓							3
.05	A-5	↓	~~9~~ 9:54	↓	↓									↓							3
.06	A-6	↓	~~[illegible]~~ 9:50	↓	↓									↓							3
.07	A-7	↓	~~[illegible]~~ 9:56	↓	↓									↓							2
.08	A-8	↓	9:55	↓	↓									↓							2
.09	A-9	↓	9:50	↓	↓									↓							2
.10	A-10	↓	9:30	↓	↓									↓							2

	VOC	SVOC	METALS	METALS	EPH	VPH	PCB/PEST	TPH	Com-97 + MCP14 Metals					
Container Type														
Preservative	F								A					

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
R Tella	7/6/18 11:35	Chris [illegible]	7/6/18 11:35

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
VOLATILES

Client	: Lord Associates, Inc.	**Lab Number**	: L1825765
Project Name	: WORC SO HS.	**Project Number**	:
Lab Sample ID	: WG1134832-5	**Lab File ID**	: V23180711N05
Instrument ID	: VOA123		
Matrix	: SOIL	**Analysis Date**	: 07/11/18 20:34

Client Sample No.	Lab Sample ID	Analysis Date
WG1134832-3LCS	WG1134832-3	07/11/18 18:52
WG1134832-4LCSD	WG1134832-4	07/11/18 19:17
A-1	L1825765-01	07/11/18 21:00
A-2	L1825765-02	07/11/18 21:25
A-3	L1825765-03	07/11/18 21:51
A-4	L1825765-04	07/11/18 22:16
A-5	L1825765-05	07/11/18 22:42
A-6	L1825765-06	07/11/18 23:07
A-7	L1825765-07	07/11/18 23:33
A-8	L1825765-08	07/11/18 23:59
A-9	L1825765-09	07/12/18 00:24
A-10	L1825765-10	07/12/18 00:50

Continuing Calibration
Form 7

Client : Lord Associates, Inc.
Project Name : WORC SO HS.
Instrument ID : VOA123
Lab File ID : V23180711N01
Sample No : WG1134832-2
Channel :

Lab Number : L1825765
Project Number :
Calibration Date : 07/11/18 18:52
Init. Calib. Date(s) : 06/06/18 06/07/18
Init. Calib. Times : 16:59 12:17

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	60	-.01
Dichlorodifluoromethane	0.226	0.239	-	-5.8	20	66	0
Chloromethane	0.244	0.307	-	-25.8*	20	78	0
Vinyl chloride	0.27	0.283	-	-4.8	20	63	0
Bromomethane	20	17.315	-	13.4	20	50	0
Chloroethane	0.184	0.16	-	13	20	52	.01
Trichlorofluoromethane	0.326	0.313	-	4	20	58	.02
Ethyl ether	0.139	0.154	-	-10.8	20	66	0
1,1-Dichloroethene	0.197	0.213	-	-8.1	20	67	0
Carbon disulfide	0.665	0.718	-	-8	20	68	0
Freon-113	0.197	0.214	-	-8.6	20	67	0
Acrolein	0.048	0.053	-	-10.4	20	67	0
Methylene chloride	20	21.689	-	-8.4	20	64	0
Acetone	20	22.228	-	-11.1	20	63	-.01
trans-1,2-Dichloroethene	0.23	0.244	-	-6.1	20	63	0
Methyl acetate	0.183	0.22	-	-20.2*	20	72	0
Methyl tert-butyl ether	0.717	0.751	-	-4.7	20	62	-.01
tert-Butyl alcohol	0.04	0.041*	-	-2.5	20	58	-.03
Diisopropyl ether	0.691	0.863	-	-24.9*	20	73	-.02
1,1-Dichloroethane	0.409	0.468	-	-14.4	20	68	-.01
Halothane	0.177	0.182	-	-2.8	20	62	0
Acrylonitrile	0.092	0.112	-	-21.7*	20	70	-.01
Ethyl tert-butyl ether	0.746	0.821	-	-10.1	20	65	-.01
Vinyl acetate	0.566	0.537	-	5.1	20	55	-.01
cis-1,2-Dichloroethene	0.257	0.267	-	-3.9	20	61	0
2,2-Dichloropropane	0.355	0.379	-	-6.8	20	65	0
Bromochloromethane	0.12	0.116	-	3.3	20	56	-.01
Cyclohexane	0.359	0.448	-	-24.8*	20	79	-.01
Chloroform	0.409	0.43	-	-5.1	20	62	-.01
Ethyl acetate	0.27	0.321	-	-18.9	20	70	-.02
Carbon tetrachloride	0.302	0.302	-	0	20	61	0
Tetrahydrofuran	0.099	0.115	-	-16.2	20	70	-.02
Dibromofluoromethane	0.252	0.228	-	9.5	20	54	-.01
1,1,1-Trichloroethane	0.349	0.353	-	-1.1	20	61	-.01
2-Butanone	0.128	0.151	-	-18	20	71	-.02
1,1-Dichloropropene	0.305	0.335	-	-9.8	20	67	-.01
Benzene	0.959	1.034	-	-7.8	20	65	-.01
tert-Amyl methyl ether	0.757	0.78	-	-3	20	61	-.01
1,2-Dichloroethane-d4	0.283	0.281	-	0.7	20	61	-.02
1,2-Dichloroethane	0.318	0.323	-	-1.6	20	59	-.01
Methyl cyclohexane	0.404	0.452	-	-11.9	20	69	0
Trichloroethene	0.241	0.249	-	-3.3	20	62	-.01
Dibromomethane	0.153	0.154	-	-0.7	20	59	-.01
1,2-Dichloropropane	0.236	0.272	-	-15.3	20	67	-.02
2-Chloroethyl vinyl ether	0.175	0.196	-	-12	20	66	-.02

* Value outside of QC limits.

Continuing Calibration
Form 7

Client : Lord Associates, Inc.
Project Name : WORC SO HS.
Instrument ID : VOA123
Lab File ID : V23180711N01
Sample No : WG1134832-2
Channel :

Lab Number : L1825765
Project Number :
Calibration Date : 07/11/18 18:52
Init. Calib. Date(s) : 06/06/18 06/07/18
Init. Calib. Times : 16:59 12:17

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Bromodichloromethane	0.334	0.339	-	-1.5	20	61	-.01
1,4-Dioxane	0.00396	0.00379*	-	4.3	20	51	-.02
cis-1,3-Dichloropropene	0.414	0.442	-	-6.8	20	62	-.02
Chlorobenzene-d5	1	1	-	0	20	60	-.02
Toluene-d8	1.259	1.274	-	-1.2	20	60	-.02
Toluene	0.77	0.775	-	-0.6	20	61	-.02
4-Methyl-2-pentanone	0.132	0.147	-	-11.4	20	65	-.02
Tetrachloroethene	0.308	0.291	-	5.5	20	57	-.01
trans-1,3-Dichloropropene	0.474	0.499	-	-5.3	20	61	-.02
Ethyl methacrylate	0.422	0.445	-	-5.5	20	62	-.02
1,1,2-Trichloroethane	0.235	0.252	-	-7.2	20	63	-.02
Chlorodibromomethane	0.317	0.304	-	4.1	20	56	-.02
1,3-Dichloropropane	0.476	0.514	-	-8	20	63	-.02
1,2-Dibromoethane	0.285	0.28	-	1.8	20	58	-.02
2-Hexanone	0.25	0.257	-	-2.8	20	64	-.02
Chlorobenzene	0.84	0.822	-	2.1	20	58	-.02
Ethylbenzene	1.42	1.439	-	-1.3	20	60	-.02
1,1,1,2-Tetrachloroethane	0.298	0.283	-	5	20	55	-.02
p/m Xylene	0.552	0.545	-	1.3	20	58	-.02
o Xylene	0.545	0.528	-	3.1	20	57	-.02
Styrene	0.884	0.876	-	0.9	20	57	-.02
1,4-Dichlorobenzene-d4	1	1	-	0	20	57	-.02
Bromoform	0.441	0.41	-	7	20	52	-.02
Isopropylbenzene	2.608	2.716	-	-4.1	20	58	-.02
4-Bromofluorobenzene	0.936	1.017	-	-8.7	20	61	-.01
Bromobenzene	0.675	0.651	-	3.6	20	54	-.01
n-Propylbenzene	3.135	3.404	-	-8.6	20	60	-.02
1,4-Dichlorobutane	0.929	1.08	-	-16.3	20	65	-.02
1,1,2,2-Tetrachloroethane	0.78	0.834	-	-6.9	20	59	-.02
4-Ethyltoluene	2.764	2.89	-	-4.6	20	58	-.02
2-Chlorotoluene	1.899	1.979	-	-4.2	20	58	-.02
1,3,5-Trimethylbenzene	2.203	2.264	-	-2.8	20	57	-.02
1,2,3-Trichloropropane	0.625	0.667	-	-6.7	20	59	-.02
trans-1,4-Dichloro-2-buten	0.231	0.255	-	-10.4	20	60	-.02
4-Chlorotoluene	1.96	2.069	-	-5.6	20	58	-.02
tert-Butylbenzene	1.861	1.871	-	-0.5	20	56	-.02
1,2,4-Trimethylbenzene	2.257	2.299	-	-1.9	20	56	-.02
sec-Butylbenzene	2.822	2.984	-	-5.7	20	58	-.02
p-Isopropyltoluene	2.405	2.44	-	-1.5	20	56	-.02
1,3-Dichlorobenzene	1.304	1.266	-	2.9	20	54	-.02
1,4-Dichlorobenzene	1.314	1.271	-	3.3	20	54	-.02
p-Diethylbenzene	1.565	1.575	-	-0.6	20	56	-.02
n-Butylbenzene	2.316	2.545	-	-9.9	20	60	-.02
1,2-Dichlorobenzene	1.236	1.191	-	3.6	20	54	-.01
1,2,4,5-Tetramethylbenzene	2.478	2.473	-	0.2	20	55	-.02

* Value outside of QC limits.

Continuing Calibration
Form 7

Client	: Lord Associates, Inc.	**Lab Number**	: L1825765		
Project Name	: WORC SO HS.	**Project Number**	:		
Instrument ID	: VOA123	**Calibration Date**	: 07/11/18 18:52		
Lab File ID	: V23180711N01	**Init. Calib. Date(s)**	: 06/06/18	06/07/18	
Sample No	: WG1134832-2	**Init. Calib. Times**	: 16:59	12:17	
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dibromo-3-chloropropan	0.146	0.132	-	9.6	20	51	-.02
1,3,5-Trichlorobenzene	1.039	1.01	-	2.8	20	54	-.01
Hexachlorobutadiene	0.464	0.453	-	2.4	20	55	0
1,2,4-Trichlorobenzene	0.92	0.897	-	2.5	20	54	-.02
Naphthalene	2.497	2.453	-	1.8	20	54	-.02
1,2,3-Trichlorobenzene	0.885	0.856	-	3.3	20	53	-.01

* Value outside of QC limits.

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APPENDIX M

ORDER OF CONDITIONS

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2018 00100296
Bk: 59440 Pg: 269
Page: 1 of 20 09/21/2018 02:19 PM WD

CC-2018-063
(Amendment to CC-2018-024)
South High Community School

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1194
MassDEP File #

eDEP Transaction #
Worcester
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: City of Worcester
Conservation Commission

2. This issuance is for (check one): a. ☐ Order of Conditions b. ☒ Amended Order of Conditions

3. To: Applicant:

a. First Name: Paul J.
b. Last Name: Moosey
c. Organization: City of Worcester Department of Public Works & Parks
d. Mailing Address: 20 East Worcester Street
e. City/Town: Worcester
f. State: MA
g. Zip Code: 01604

4. Property Owner (if different from applicant):

a. First Name:
b. Last Name:
c. Organization:
d. Mailing Address:
e. City/Town:
f. State:
g. Zip Code:

5. Project Location:

a. Street Address: 170 (aka 140) Apricot Street
b. City/Town: Worcester
c. Assessors Map/Plat Number: 56-016
d. Parcel/Lot Number: -00013

Latitude and Longitude, if known: d. Latitude: d m s e. Longitude: d m s

10
20

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1194
MassDEP File #

eDEP Transaction #
Worcester
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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Worcester
a. County

b. Certificate Number (if registered land)

5436
c. Book

61
d. Page

7. Dates:

8/1/2018
a. Date Notice of Intent Filed

8/20/2018
b. Date Public Hearing Closed

9/10/2018
c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

South High Community School - Amendment to Order of Conditions
a. Plan Title

Nitsch Engineering and Lamoureux Pagano Associates, Architects
b. Prepared By

Jared E. Gentilucci, P.E.
c. Signed and Stamped by

August 1, 2018, as revised by Attachment A
d. Final Revision Date

Various
e. Scale

Amendment to An Order of Conditions Application Materials & Supplemental Information
f. Additional Plan or Document Title

8/1/2018
8/13/2018
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☒ Private Water Supply
e. ☒ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

CC-2018-063
(Amendment to CC-2018-024)
South High Community School

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1194
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B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) 0' a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

B. Findings (cont.)

23. ☐ Restoration/Enhancement *:

a. square feet of BVW

b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

* **#23**. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on **5/18/2021** unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number 349-1194 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☒ is subject to the Massachusetts Stormwater Standards
    (2) ☐ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
  1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
  2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
  3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

See Attachment A.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

CC-2018-063
(Amendment to CC-2018-024)
South High Community School

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1194
MassDEP File #

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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The City of Worcester Conservation Commission hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   City of Worcester Wetlands Protection Ordinance & Regulations
   1. Municipal Ordinance or Bylaw
   COW GRO Part 1. Ch. 6.
   2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   City of Worcester Wetlands Protection Ordinance & Regulations
   1. Municipal Ordinance or Bylaw
   COW GRO Part 1. Ch. 6.
   2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):
   See Attachment A.

ATTACHMENT A

Worcester Conservation Commission

Special Order of Conditions

City of Worcester Wetlands Protection Ordinance & City of Worcester Wetlands Protection Regulations
(City of Worcester Revised Ordinance Part I, Chapter 6)
And
Massachusetts General Laws, Chapter 131, §40 - Massachusetts Wetlands Protection Act

170 (aka 140) Apricot Street (CC-2018-063)

Project Description: To construct the new South High Community School, associated drives, parking areas and athletic facilities, including the eventual demolition of the existing high school, to conduct related grading, drainage, paving, and site work including work to restore and upgrade drainage outlet #4 to appropriate standars.

Table of Contents

Notes:

- **Office of the Commission** is located at the Division of Planning and Regulatory Services (455 Main Street 4th floor, Worcester, MA), which can be contacted by e-mailing planning@worcesterma.gov or calling 508-799-1400 ext. 31440.
- **Asterisked (*) conditions** are standard conditions of approval for all projects.

I. Conditions to Meet Prior to and During Construction

21. Person Responsible for Compliance with the Order of Conditions* – A person shall be designated to be responsible to monitor compliance with the Order of Conditions. Their name and contact information (24/7) shall be provided to the Office of the Commission prior to start of any activity. This person shall conduct:
    a) periodic inspections to assure the adequacy and continued effectiveness of erosion and sediment controls;
    b) inspections of said controls following 0.5-inch or greater rain events, or after a heavy snow melt.
22. Contract* - This Order of Conditions and all approved plans shall be included as part of any contract and subcontract and shall be posted in a prominently displayed location in the supervisory office on site during all phases of construction.
23. Notification* - The applicant shall notify the Office of the Commission a minimum of 48 hours prior to the start of any activity.
24. Wetland & Bank Flagging – Prior to construction, wetland and bank flags shall be installed along the wetland and bank boundary, and shall remain in place during and after construction until approved for removal through the issuance of Certificate of Compliance for the entire project.

II. Conditions to Meet Before the Start of Any Activity

25. Revised Plans – That three (3) to-scale copies of revised plans shall be provided to the Office of the Commission, prior to commencement of work, showing the below changes. These plans shall be considered the final revised plans approved for the project -
    a) Provide calculations addressing appropriate volumetric sizing of all temporary sediment basins;
    b) Addressing the following comments outlined in the DPRS staff comment letter:
        i. Clearly depict a revised limit of work associated with the improvement of the conditions at outlet #4, including installation of a straw wattle or other similar barrier at the limit of work, adjacent to the BVW;
        ii. Re-locate LOW around tennis court to edge of work;
        iii. Add a note regarding installation of erosion control blankets on all slopes 3:1 or greater;
        iv. Update erosion control details to reflect silt fence with straw wattles;
        v. Provide a detail for the earth retention system;
        vi. Provide information regarding proposed dewatering protocols;
        vii. Show protection around rain-gardens/bio-retention areas;
        viii. Provide a detail for the proposed retaining wall;
        ix. Update plans to include new Amended OOC date;
        x. Add Conservation Agent to Demo Note #17;
        xi. Revise phasing plan to show existing conditions on a separate sheet;
        xii. Include slope stabilization along the NW side of the new school in Phase 1A.
        xiii. Address potential to re-locate construction trailer sot the East side of the temporary access road on revised plans

26. Stormwater Pollution Prevention Plan (SWPPP)* – That one (1) copy of the SWPPP submitted to the EPA in compliance with the NPDES permit requirements, if applicable, shall be provided to the Office of the Commission prior to commencement of work.

27. Tree Cutting* – Tree cutting is allowed following installation of erosion and sediment controls; otherwise, it may be allowed, prior to such installation, with the explicit permission of the Commission or its Agents.

28. Trees To Remain* – All trees to remain post construction shall be marked on site as shown on the approved plan so that the Commission or its representative can verify them before any clearing takes place.

29. Pre-Construction Conference* -

    a) The Conservation Commission or its Agents shall conduct a pre-construction conference prior to commencement of activities in each phase of the project. Phasing, if any, shall conform to the approved plans.

    b) The property owner / applicant and any person performing work that is subject to this Order are responsible for understanding and complying with the requirements of this Order, the Wetlands Protection Act, 310 CMR 10.00 and City of Worcester Wetlands Protection Ordinance and Regulations. Said persons shall acknowledge such in writing prior to commencement of activities.

30. Inspections Prior to Site Preparation and Site Work* - Erosion and sediment controls shall be installed and verified, in compliance with final approved plans, by the Commission or its Agents prior to the commencement of any excavation, grubbing and/or stumping of vegetation, grading, construction, or other site preparation.

31. Demarcation of Limit of Work – For areas of work within the 100 foot buffer to a bordering vegetated wetland/bank, prior to construction, the contractor shall stake out the 15 foot Worcester Wetlands Protection Ordinance no-disturb buffer or limit of work, whichever is further from the bordering vegetated wetlands, using an orange snow/construction fence to demarcate the no-disturbance zone during construction in order to prevent encroachments beyond the approved limit of work and prevent resource area impacts.

32. Construction Schedule - Submit a Construction Schedule consistent with Work Sequencing plans provided to the Office of the Commission prior to the start of any activities. The schedule shall include provisions for the required improvements for outlet #4 to commence *prior* to any other phases of construction and site work. Said schedule shall include a separate inspection by the Commission and/or its agents of the erosion controls to be located at stormwater outlet #4 prior to commencement of any restoration activities.

33. Stormwater Outlet Restoration -

    a) Improvements and maintenance required at outlet #4 shall be completed by hand, under the direct supervision of the designated environmental monitor, as shown in the approved plans.

    b) Said restoration shall be completed prior to other site activities to ensure optimal dissipation of flow velocity to prevent erosion associated with scour from stormwater runoff as construction progresses.

    c) This system shall be monitored to ensure appropriate performance and shall be maintained in good hydraulic condition (e.g. any accumulated silt/sediment shall be removed; the system shall be kept free of any litter, refuse, or other extraneous matter, etc.) throughout the duration of other site construction activities.

34. Infiltration Unit Inspection - Prior to back-filling, the applicant shall request and have conducted an inspection by the Commission or its Agents in order to verify the installation of the infiltration unit was conducted in a manner consistent with that provided on the approved plans.

III. Stormwater Management System

35. Catch Basins* –

   a) The paved roadways and parking lots shall be bermed and shall be installed with standard City of Worcester catch basins.

   b) Prior to start of activity on site that causes soil erosion and sedimentation, catch basin filter traps shall be installed in the existing and new catch basins.

   c) Catch basins shall be cleaned as warranted during construction to keep them clear of sediment, and minimum twice a year thereafter.

36. Stormwater Management System Maintenance* – The stormwater management system shall be maintained in accordance with the approved design plans and Operation and Maintenance Plan on file with the Office of the Commission. The system shall be maintained in good hydraulic condition (e.g. any accumulated silt/sediment shall be removed; the system shall be kept free of any litter, refuse, or other extraneous matter, etc.). This condition shall extend in perpetuity beyond the issuance of the Certificate of Compliance.

IV. Conditions to Meet During Construction

37. Limit of Work* – No removal, filling, dredging or altering of jurisdictional areas shall take place outside the approved work under this Order of Condition.

38. Work Sequencing* – Activities shall take place in accordance with all phasing and sequencing shown on the plan and/or provided in the application materials on file with the Office of the Commission and shall follow any lot opening restrictions otherwise provided herein.

39. Erosion Stabilization -

   a) *Erosion and Sediment Controls** - All erosion and sediment controls shall be monitored, maintained, and adjusted for the duration of the project to prevent adverse impacts to jurisdictional areas. Additional erosion and sediment controls may be utilized on site as needed.

   b) *Off Site Impacts** - There shall be no off-site erosion, flooding, ponding, or flood-related damage from runoff caused by the project activities.

   c) *Unanticipated Drainage or Erosion** - The applicant shall control any unanticipated drainage and/or erosion conditions that may cause damage to jurisdictional areas and/or abutting or downstream properties. Said control measures shall be implemented immediately upon need. The Office of the Conservation Commission shall be notified if such conditions arise and of the measures utilized.

   d) *Soil Stabilization due to Delay in Work** - If there is an interruption of more than 14 days between completion of grading and revegetation, the applicant shall sow all disturbed areas with annual rye grass to prevent erosion. If soils are to be exposed for longer than 60 days, a temporary cover of rye or other grass should be established following US Soil Conservation Services procedures, as recently amended, to prevent erosion and sedimentation. Once final grading is complete, loaming and seeding of final cover should be completed promptly.

   e) *Grading of Slopes**-

      i. >40% Slope – Slopes shall not exceed those specified in the plans approved by the Conservation Commission. Any slope equal to or greater than 40% (1 vertical to 2 1/2 horizontal) shall be stabilized with erosion control matting.

    ii. <40% Slope – Final grades of vegetated areas shall not exceed a slope of 1 vertical to 2 1/2 horizontal (40%) and shall be stabilized to prevent erosion, particularly during the construction period.

f) *Stockpile Maintenance** - Any stockpiling of loose materials shall be properly stabilized to prevent erosion into and sedimentation of jurisdictional areas. Preventative controls such as haybales or erosion control matting shall be implemented to prevent such an occurrence.

g) *Stockpile Location* – In no case shall any soil or excavated material be stockpiled within 100 feet of any wetland, or storm drain inlet.

h) *Site Stabilization Prior to Winter** - Prior to winter, exposed soils shall be stabilized (e.g. with demonstrated vegetative growth, impermeable barriers, erosion control blankets, etc.).

40. Invasive Insects* -

a) *Plantings* – No trees to be planted shall be species susceptible to the Asian Longhorned Beetle or Emerald Ash Borer.

b) *Wood Removal* – All tree, brush & wood removal shall adhere to the most recently amended requirements set forth by the Massachusetts Department of Conservation & Recreation for any project located in the Asian Longhorned Beetle Quarantine Zone.

41. Dust Control* - Provisions for dust control shall be provided during all construction and demolition activities. Such provisions shall be conducted in compliance with all City of Worcester Water Use Restrictions, if in effect, during such activities.

42. Dewatering* – If dewatering is required,

a) Notice of such activities shall be given to the Office of the Commission within 24 hours of commencement;

b) There shall be no discharge of untreated dewatered stormwater or groundwater to jurisdictional areas either by direct or indirect discharge to existing drainage systems;

c) Any discharge to surface waters or drainage structures must be visibly free of sediment;

d) To the maximum extent practicable, proposed dewatering activities should be located outside of the 100' buffer. If such activities must be located within the 100' buffer, they shall be monitored at all times when the pumps are running;

e) Dewatering activities shall be confined within an area of secondary containment at all times.

43. Cement Truck Washing - Cement trucks shall not be washed out in any resource area or buffer zone area, or into any drainage system.

44. Equipment/Material Placement - No equipment or materials are to enter or be placed in the wetland resource area at any time.

45. Turbidity Monitoring Construction Reports –

a) Written construction reports, prepared by a competent individual specializing in erosion and sediment controls independent of the project contractor (e.g. professional engineer, professional wetland scientist, etc.), shall be submitted to the Commission during all earthwork and drainage construction.

b) The *first report* shall be submitted to the Conservation Commission prior to commencement of construction activities and shall include base line measurements at the three existing outfall locations to be selected by the Conservation Commission for turbidity monitoring during low flow conditions and a rain event of 0.5 inches or greater.

c) *Consequent reports* shall be submitted monthly or after each rain event of 0.5 inches or greater, whichever is more frequent, and shall include:

    i. turbidity measurements at the same locations as specified above and comparisons to the base line measurements;
    ii. an evaluation of all existing erosion and sedimentation controls, as well as stormwater management system/s; and
    iii. solutions employed and/or recommendations to fix areas found to be deficient, if any.

46. Invasive Vegetation – The goal of this condition is to keep jurisdictional areas (bufferzone and resource areas) free of all invasive, likely invasive, and potentially invasive species as identified in *The Evaluation of Non-native Plant Species for Invasiveness in Massachusetts,* published by the MA Invasive Plant Advisory Group in April 1, 2005. This condition is intended to prevent the introduction and spread of non-native and invasive species which are known to result in resource area alterations and have impacts on wildlife habitat, etc.
    a) *Material Introduction* – All imported materials, such as compost, topsoil, etc. shall be inspected for evidence of invasive vegetation prior to use within jurisdictional areas at the site in order to prevent introduction and/or the spread of invasive vegetation. No materials with evidence of invasive vegetation shall be used in jurisdictional areas.
    b) *On-going Management* - A weeding program must be implemented within all jurisdictional areas that are disturbed as part of the project. The weeding program shall begin within one month of when final grades are reached and shall continue, at a minimum of, twice per growing season until a Certificate of Compliance is issued for the project.
47. Spill Prevention* -
    a) No fuel, oil, or other pollutants shall be stored in any resource area or the buffer zone thereto, unless specified in this Order;
    b) No refueling shall take place within resource areas or 100-ft to a resource area;
    c) The applicant shall take all necessary precautions to prevent discharge or spillage of fuel, oil or other pollutants onto any part of the site;
    d) A spill kit shall be present on site at all times.

V. Conditions to Meet at Completion of Project

48. Site Stabilization* - All disturbed areas shall be properly stabilized with well-established perennial vegetation or other approved methods before the project is considered complete.
49. Erosion and Sediment Controls* - Erosion and sediment controls shall not be removed from the site until all disturbed areas have been stabilized with final vegetative cover and approval has been received from the Commission or its Agents to do so. The controls must then be removed within two weeks of receipt of that certification.
50. Certificate of Compliance* - Upon completion of the project, the applicant shall request in writing a Certificate of Compliance from the Commission. If the project has been completed in accordance with plans stamped by a registered professional engineer, architect, landscape architect, or land surveyor, certification must include a written statement by such professional certifying the same.
    a) If the project required compliance with the Massachusetts Stormwater Standards and/or work was conducted within Riverfront Area or Bordering Land Subject to Flooding, a certified as-built plan-of-land shall be provided showing final grades, resource areas, and all constructed improvements;
    b) If permanent markers were required, the certified as-built plan-of-land shall depict their location.

51. Pesticides, Etc. – No pesticides, herbicides, or fertilizers, with the exception of lime, shall be used on lawn(s) within the buffer zone to bordering vegetated wetland or bank after completion of the project, exceptions shall be made for management of invasive species if otherwise approved by the Commission.

52. Sand/Salt – The use of sand and salt on paved surfaces shall be kept to an absolute minimum during the winter months.

53. Snow Storage – At no time shall snow be stored or stockpiled within 30' of a bordering vegetated wetland or bank or a stormwater basin or inlet.

54. Deed Condition – Conditions numbered **36, 51, 52, & 53** shall extend beyond the Certificate of Compliance, in perpetuity, and shall be referred to in all future deeds to this property.

VI. General Conditions

55. Change in Ownership* - If a change in ownership takes place while this Order is still in effect, it is the responsibility of the new owner to notify the Commission of the change and to provide the name of the person responsible for compliance with the Order.

56. Conservation Agent's Power to Act* - With respect to all conditions, the Conservation Commission designates the Conservation Agent as its Agent with full powers to act on its behalf in administering and enforcing this Order, unless the Agent determines approval from the Commission is appropriate.

57. Right to Inspect* - A member of the Conservation Commission or its Agent may enter and inspect the property and the activity that are the subjects of this Order at all reasonable times, with or without probable cause or prior notice, and until a Certificate of Compliance is issued, for the purpose of evaluating compliance with this Order (and other applicable laws and regulations).

58. Changes to the Plan or Errors & Omissions* -

    (a) If any plan, calculation, or other data presented to the Office of the Commission is in error or have omissions, and are deemed significant by the Commissioners or their Agents, all work will stop at the discretion of the Commission, until the discrepancies have been rectified to the Commission's satisfaction.

    (b) The applicant must notify the Commission in writing of any changes in the plans or implementation of the proposed activity where mandated by any local, state, or federal agencies having jurisdiction over the proposed activity. If, in the opinion of the Commission, any changes in the plans or implementation of the proposed activity so require, then the Commission may modify, amend or rescind this Order in a way consistent with:

    - M.G.L. Chapter 131, Section 40,
    - 310 CMR 10.00, *Wetlands Protection*,
    - the City of Worcester's *Wetlands Protection Ordinance*, and
    - the Commission's *Wetlands Protection Regulations*

    If any provisions of any conditions, or application thereof is held to be invalid, such invalidity shall not affect any other provisions of this Order. If the Commission deems that a proposed change is major or substantial, a new hearing may be required.

59. Liability* - The applicant shall indemnify and save harmless the Commonwealth, the City of Worcester, the Conservation Commission, and its Agents against all sites, claims or liabilities of every name and nature arising at any time out of or in consequence of the acts of the Commission

or its Agents in the performance of the work covered by this Order and/or failure to comply with the terms and conditions or this Order whether by itself or its employees or subcontractors.

170 Apricot St.

CC-2018-063

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1194
MassDEP File #

eDEP Transaction #

Worcester
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

9/18/2018
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☒ by hand delivery on

9/10/2018
Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

CC-2018-063
(Amendment to CC-2018-024)
South High Community School

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Worcester Conservation Commission
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:
Worcester Conservation Commission
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

170 (aka 140) Apricot Street — 349-1194
Project Location — MassDEP File Number

Has been recorded at the Registry of Deeds of:

Worcester
County — Book — Page

for: City of Worcester
Property Owner

and has been noted in the chain of title of the affected property in:

Book — Page

In accordance with the Order of Conditions issued on:

9/10/18
Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

ATTEST: WORC. Anthony J. Vigliotti, Register

Official Receipt for Recording in:

Worcester South Registry of Deeds
90 Front St.

Worcester, Massachusetts 01608

Issued To:
JARED GENTILUCCI
978-771-6498

Recording Fees

Document Description	Number	Book/Page	Recording Amount
ORD	00100296	59440 269	$75.00
			$75.00

Collected Amounts

Payment Type		Amount
Check	1083	$75.00
		$75.00

Total Received :	$75.00
Less Total Recordings:	$75.00
Change Due :	$.00

Thank You
ANTHONY J. VIGLIOTTI - Register of Deeds

By: L Martone

Receipt#	Date	Time
1101224	09/21/2018	02:19p

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APPENDIX N

FONTAINE – WT RICH PHASING PLANS

(PH-2, PH-2A, PH-2B, PH-3, PH-3A)

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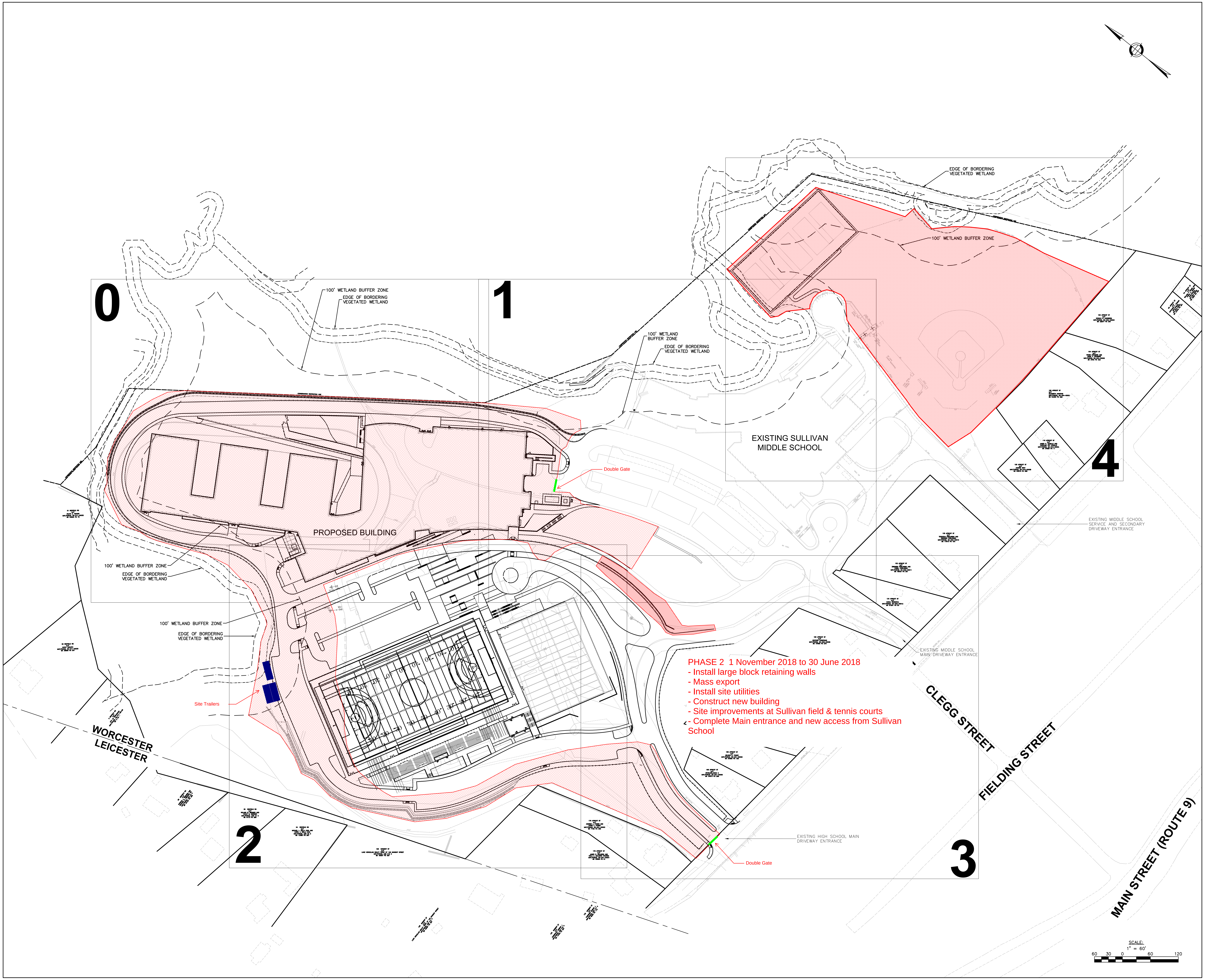

PHASE 2 1 November 2018 to 30 June 2018
- Install large block retaining walls
- Mass export
- Install site utilities
- Construct new building
- Site improvements at Sullivan field & tennis courts
- Complete Main entrance and new access from Sullivan School

LAMOUREUX PAGANO
ASSOCIATES, ARCHITECTS
108 GROVE STREET, SUITE 300
WORCESTER, MASSACHUSETTS 01605

MEMBER OF
THE AMERICAN INSTITUTE OF ARCHITECTS

CONSULTANT

Worcester Public Schools

Worcester, MA

Project North

PROJECT

EARLY SITE BID PACKAGE #2

South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

FONTAINE-WT RICH
PHASING
PLAN

Key Plan

REVISIONS		
No.	Description	Date

FILE: 11677clo
DWN. BY: ER
JOB NO: #1611
CKD. BY: JEG
SCALE: 1"=60'
DATE: August 3, 2018

PH-2

Nitsch Project #11677

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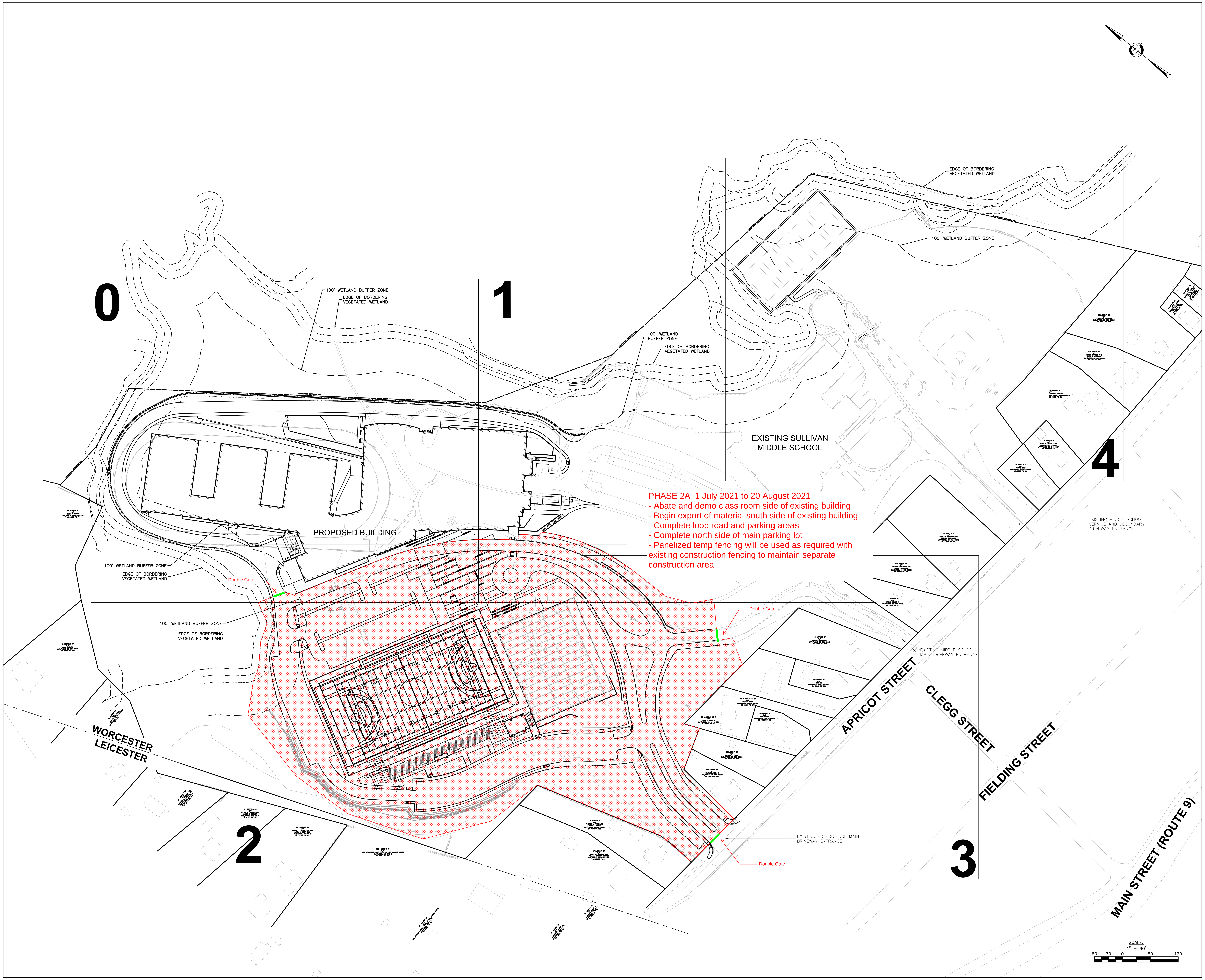

PHASE 2A 1 July 2021 to 20 August 2021
- Abate and demo class room side of existing building
- Begin export of material south side of existing building
- Complete loop road and parking areas
- Complete north side of main parking lot
- Panelized temp fencing will be used as required with existing construction fencing to maintain separate construction area

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Worcester Public
Schools

Worcester, MA

Project North

PROJECT

EARLY SITE BID PACKAGE #2

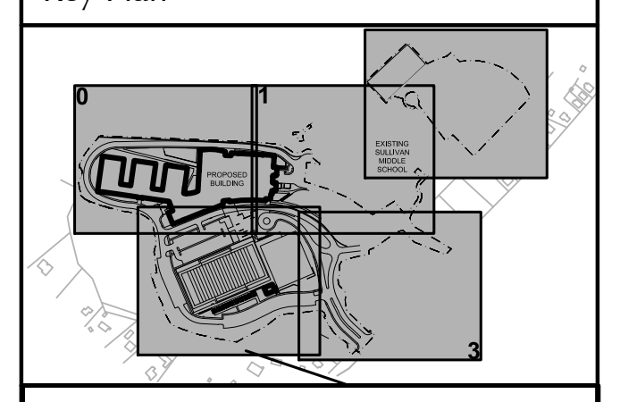
South High
Community School

170 Apricot Street, Worcester, MA 01603

TITLE

FONTAINE-WT RICH
PHASING
PLAN

Key Plan



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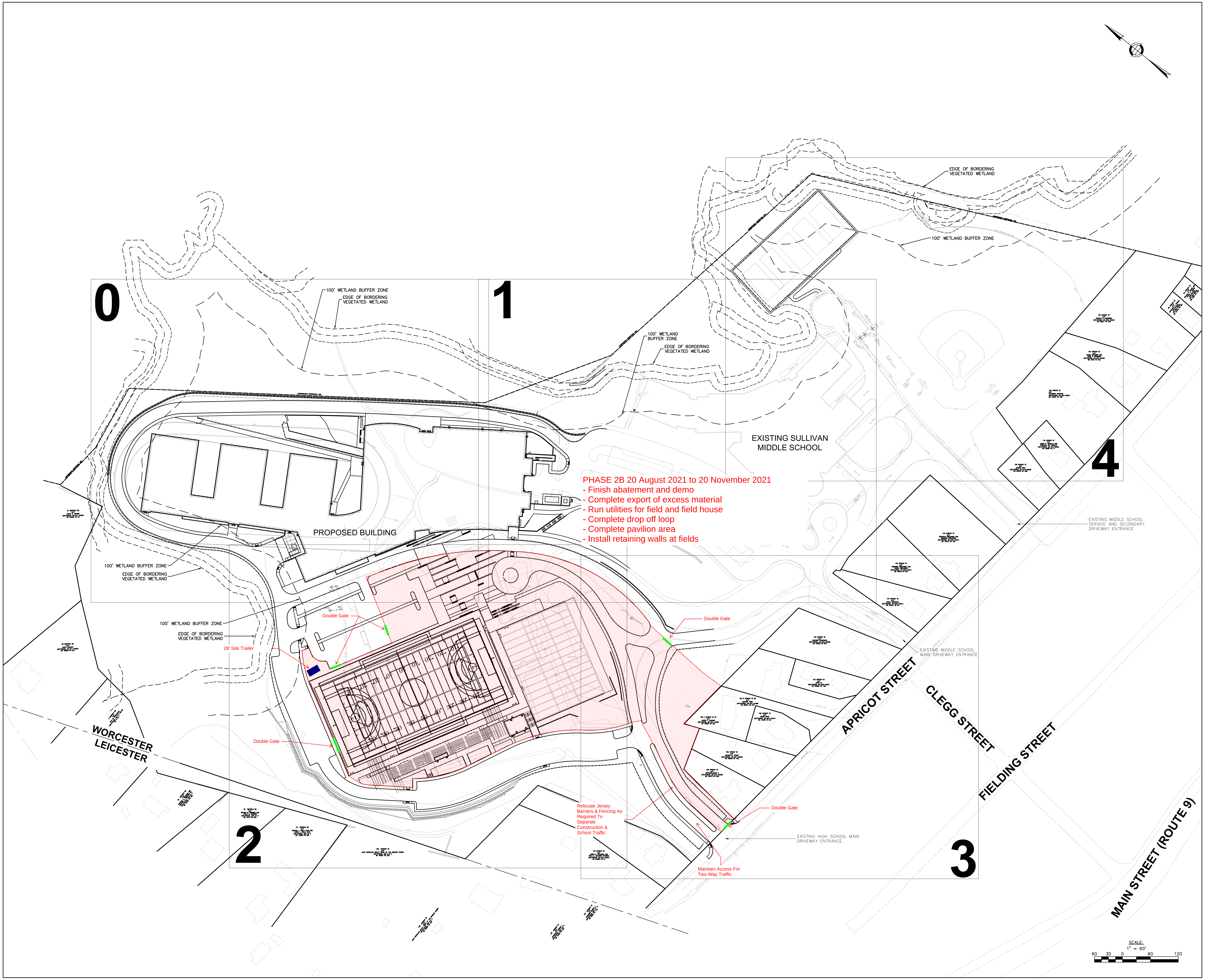

PHASE 2B 20 August 2021 to 20 November 2021
- Finish abatement and demo
- Complete export of excess material
- Run utilities for field and field house
- Complete drop off loop
- Complete pavilion area
- Install retaining walls at fields

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EARLY SITE BID PACKAGE #2

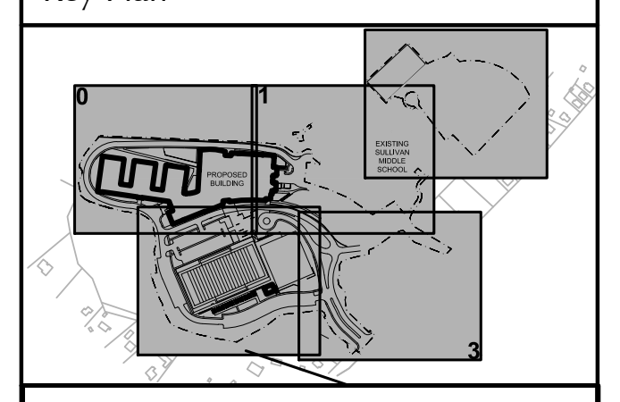
South High
Community School

170 Apricot Street, Worcester, MA 01603

TITLE

FONTAINE-WT RICH
PHASING
PLAN

Key Plan



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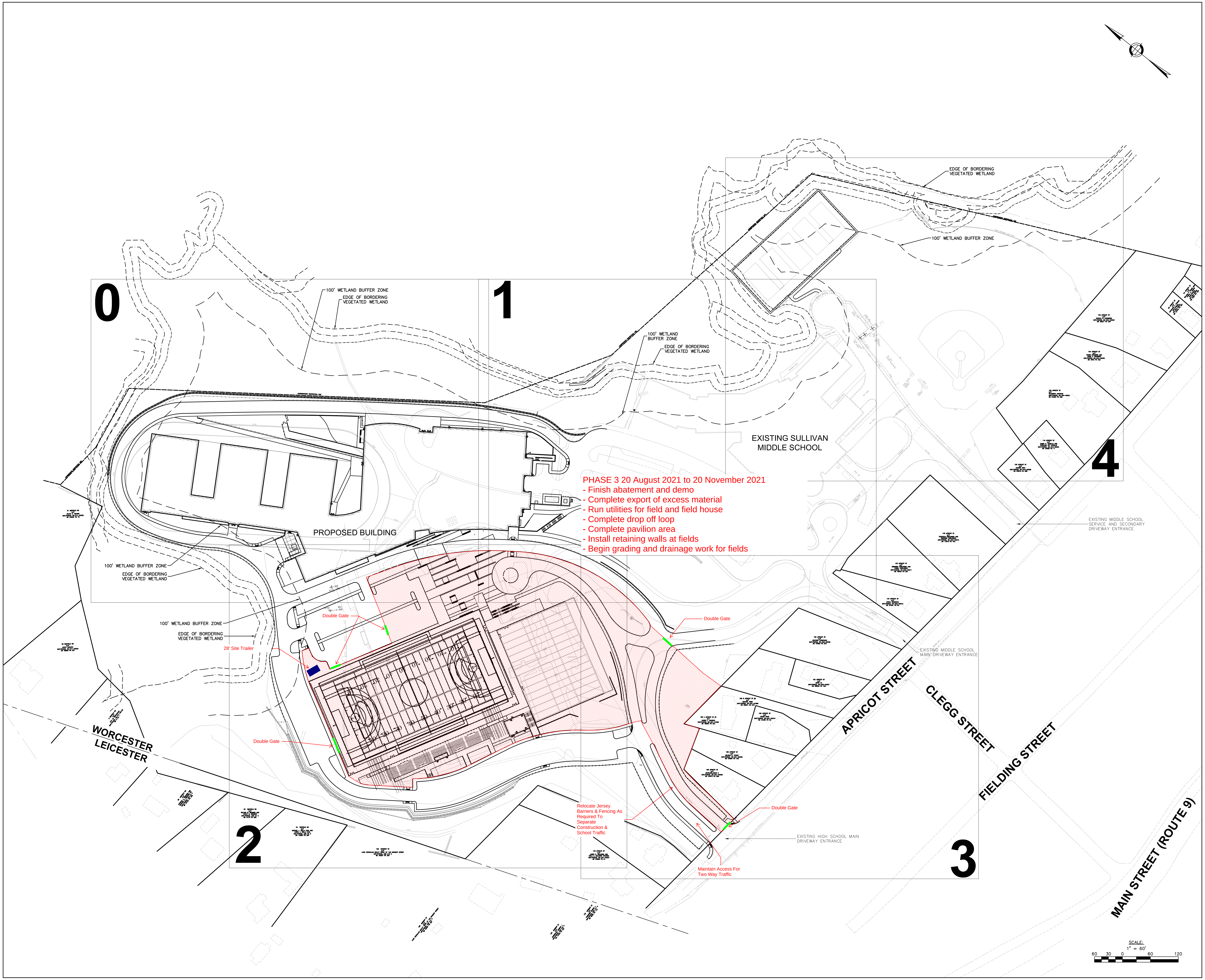

PHASE 3 20 August 2021 to 20 November 2021

- Finish abatement and demo
- Complete export of excess material
- Run utilities for field and field house
- Complete drop off loop
- Complete pavilion area
- Install retaining walls at fields
- Begin grading and drainage work for fields

Double Gate

Double Gate

28' Site Trailer

Double Gate

Double Gate

Relocate Jersey Barriers & Fencing As Required To Separate Construction & School Traffic

Maintain Access For Two Way Traffic

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PROJECT

EARLY SITE BID PACKAGE #2

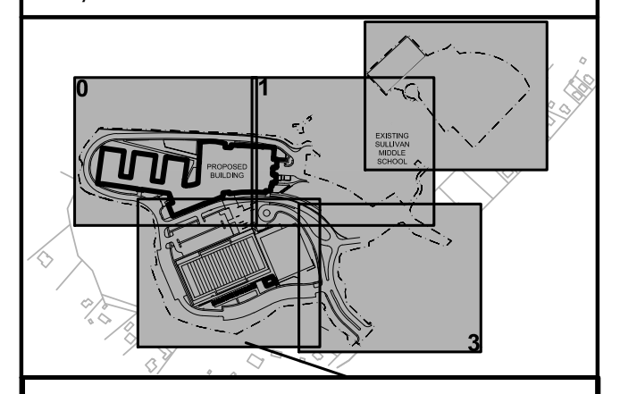
South High Community School

170 Apricot Street, Worcester, MA 01603

TITLE

FONTAINE-WT RICH PHASING PLAN

Key Plan



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FILE: 11677clo

DWN. BY: ER

JOB NO: #1611

CKD. BY: JEG

SCALE: 1"=60'

DATE: August 3, 2018

PH-3

Nitsch Project #11677

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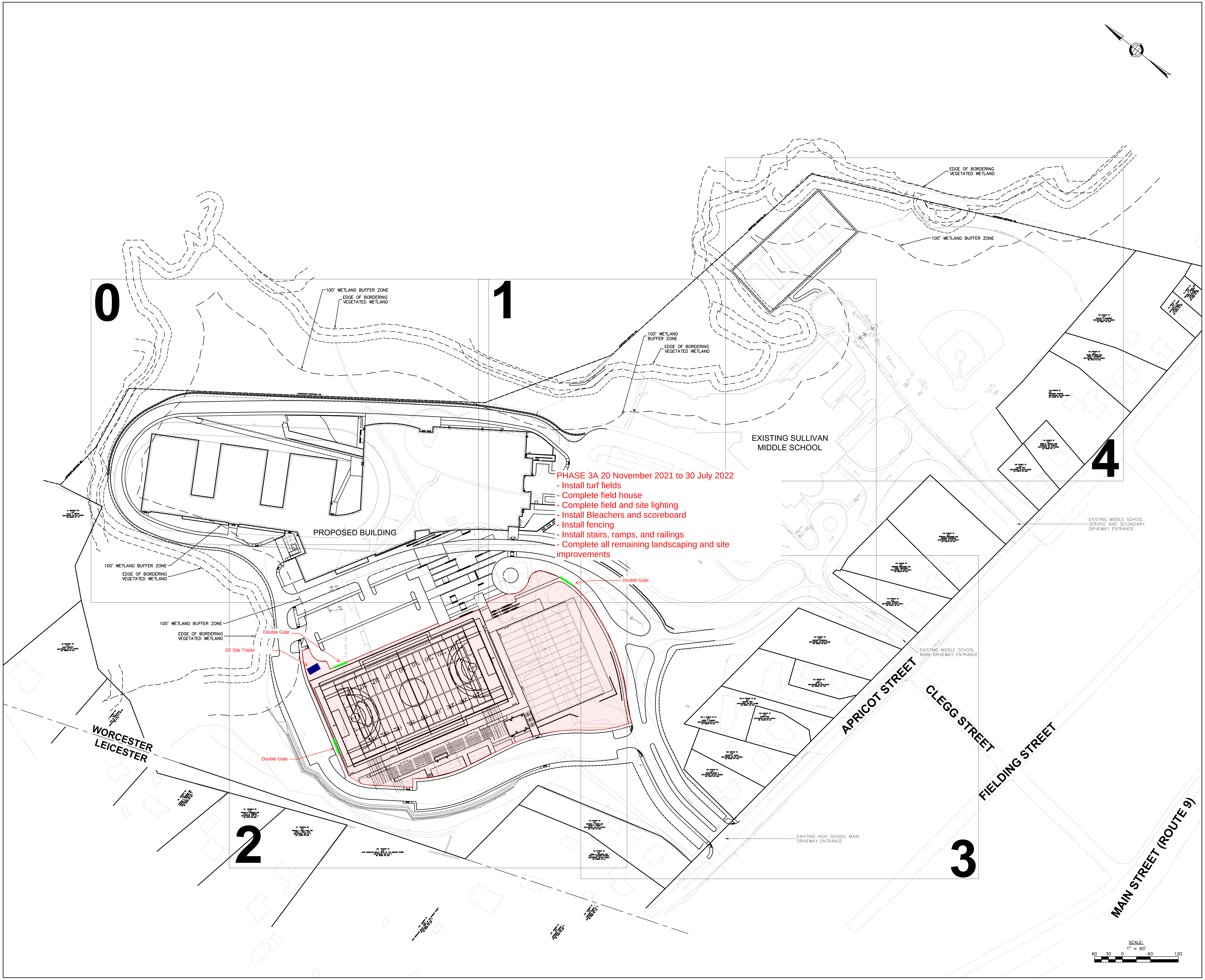

PHASE 3A 20 November 2021 to 30 July 2022
- Install turf fields
- Complete field house
- Complete field and site lighting
- Install Bleachers and scoreboard
- Install fencing
- Install stairs, ramps, and railings
- Complete all remaining landscaping and site improvements

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Worcester, MA

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PROJECT

EARLY SITE BID PACKAGE #2

South High
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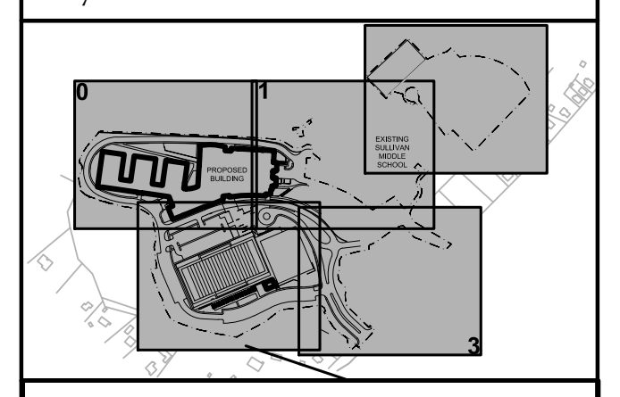
170 Apricot Street, Worcester, MA 01603

TITLE

FONTAINE-WT RICH
PHASING
PLAN

Key Plan



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