APPENDIX A
Geotechnical Data Report

THIS PAGE INTENTIONALLY LEFT BLANK

NBC Phase III CSO Program Consolidation Conduits IIIA-4 and IIIA-5

Geotechnical Data Report

Report Status (Final)
Revision No. 4

McMILLEN JACOBS ASSOCIATES

June 2020

This page intentionally left blank.

Table of Contents

1.0 General 1
1.1 Introduction 1
1.2 Proposed Construction 1
1.3 Elevation Datum and Coordinate System 2
2.0 Subsurface Explorations 3
2.1 Exploration Program 3
2.2 Test Borings 3
3.0 Subsurface Investigations by Others 7
3.1 General 7
3.2 Previous Test Borings by Stantec/Pare 7
3.3 Tidewater Site 7
3.4 Other Sources of Data 7
4.0 Laboratory Testing 8
4.1 General 8
4.2 Soil Testing 8
4.2.1 Grain Size Distribution 8
4.3 Rock Testing 8
4.3.1 Unconfined Compressive Strength 8
4.3.2 Cerchar Abrasivity Index 8
4.3.3 Brazilian Tensile Strength 8
5.0 Limitations 9

List of Tables

Table 1 Summary of Subsurface Exploration Program
Table 2 Summary of Laboratory Testing Program

List of Figures

Figure 1 Project Locus
Figure 2 Site and Subsurface Exploration Location Plan (2A – 2E)

Appendices

Appendix A Test Boring Logs

Appendix B Rock Core Photographs

Appendix C Groundwater Observation Well Installation and Monitoring Reports

Appendix D Subsurface Investigations by Others

Appendix E Geotechnical Laboratory Test Results

Distribution

To: William Skerpan, Jr.
BETA Group, Inc.

From: Tennyson M. Muindi
McMillen Jacobs Associates

Prepared By: Samuel G. Wilbur
McMillen Jacobs Associates

Reviewed By: Katherine R. O'Hara
McMillen Jacobs Associates

Revision Log

Revision No.	Date	Revision Description
0	11/22/2019	1st Internal Draft
1	03/13/2020	2nd Internal Draft – Incorporation of Supplemental Boring Program
2	04/10/2020	Draft for 30% BODR
3	05/12/2020	Draft
4	06/09/2020	Final

1.0 General

1.1 Introduction

This Geotechnical Data Report (GDR) presents a summary of the subsurface investigation program that was conducted by McMillen Jacobs Associates (McMillen Jacobs) for the Narraganset Bay Commission (NBC) Phase III Combined Sewer Overflow (CSO) Consolidation Conduits IIIA-4 and IIIA-5 Project (the Project) located in Pawtucket, Rhode Island. This work was performed under our Subconsultant Agreement with BETA Group, Inc (BETA), dated 5 March 2019.

The specific objective of the investigatory work was to conduct geotechnical subsurface explorations and a laboratory testing program to acquire data on engineering characteristics and properties of the subsurface materials.

In accordance with the referenced contract, McMillen Jacobs completed the following tasks:

- Prepared a Work Plan describing roles, responsibilities, and field investigations.
- Prepared a Health and Safety Plan (HASP) specific to the anticipated field investigation activities that described the health and site safety procedures to be followed during performance of the work.
- Provided on site supervision during drilling of the subsurface explorations.
- Arranged for and contracted with a geotechnical testing laboratory (GeoTesting Express, of Acton, Massachusetts) to perform geotechnical soil and rock testing on selected samples obtained from the test borings.
- Reviewed information from previous subsurface investigations performed for preliminary design of this Project and other projects located adjacent to the proposed alignment.
- Compiled, prepared, and submitted this GDR that documents the results of the subsurface investigation program.

1.2 Proposed Construction

The Project is one component of the NBC Phase III CSO Program, which began in 2016 and is focused primarily on the Bucklin Point Service Area (BPSA) in the communities of Pawtucket and Central Falls. The overall NBC CSO Program is aimed at lowering annual CSO volumes and reducing annual shellfish bed closures in accordance with a 1992 Consent Agreement with the Rhode Island Department of Environmental Management (RIDEM). Phases I and II of this program, which focused on the Field's Point Service Area (FPSA) in Providence, were completed in 2008 and 2015, respectively. Stantec, along with Pare Corporation as a subconsultant, is under contract with NBC to serve in the role as the Program Manager/Construction Manager (PM/CM) for Phase III CSO Program.

The Project includes the design and construction of consolidation conduits, flow diversions, a gate and screening structure, flow meters, instrumentation panels, sluice gates, and other ancillary facilities necessary to convey flow from outfalls OF-210, OF-211, OF-213, OF-214, and OF-217 to a tunnel via Drop Shaft 213 (DS-213), set to be construction under a separate contract.

1.3 Elevation Datum and Coordinate System

Horizontal coordinates in this document are projected to Rhode Island Mainland State Plane, North American Datum (NAD) 1983 and elevations are referenced to the National Geodetic Vertical Datum (NVGD) 1929, in feet.

The survey base plan was provided to McMillen Jacobs by BETA. Plan locations and elevations of the test borings were determined by Bryant Associates, Inc. of Lincoln, Rhode Island. The Project location is included on Figure 1, Project Locus. The locations of the test borings have been plotted on Figures 2A through 2E, Site and Subsurface Exploration Location Plan.

2.0 Subsurface Explorations

2.1 Exploration Program

Geotechnical test borings were performed to assess soil and bedrock conditions at the site and to acquire data on the engineering characteristics and properties of the subsurface materials. Analytical sample collection and assessment of the environmental subsurface conditions was performed by BETA during the exploration program. Details of the subsurface exploration program are described in the following sections.

2.2 Test Borings

Thirteen (13) geotechnical test borings were performed by Geologic Earth Exploration, Inc. (Geologic), Norwood, MA, during the periods of 27 August to 18 September 2019 and 4 February to 12 February 2020 at the locations shown on Figure 2. Table 1 presents a summary of the subsurface exploration program.

A representative from BETA was onsite to monitor air quality. In addition, soil samples were collected in the initial 10 feet of drilling and were submitted to the analytical laboratory for testing. Refer to the Environmental Data Report (EDR) for details and results of analytical testing.

Test borings were designated B-1 through B-13 and were terminated at depths ranging from 4 to 51 feet below existing ground surface. Vacuum excavation was performed to a depth of 6 feet at test boring locations B-1, B-2, B-3, B-6, and B-8 through B-13 to mitigate the potential for damaging any unidentified existing utilities. A representative photograph taken during vacuum excavation is shown below.

Vacuum Excavation at Test Boring B-3

Test borings were advanced using either a rubber track mounted CME-45A drill rig or a rubber track mounted Acker Scout drill rig using rotary drilling techniques with a 3-7/8 in. diameter tri-cone roller bit.

Test borings B-1, B-2, B-3, and B-9 through B-13 were drilled on the former Tidewater Site owned by National Grid. The Tidewater Site is a former MGP and power plant site and is classified as a superfund site. On behalf of National Grid, a representative from GZA GeoEnvironmental, Inc. (GZA) was onsite to provide access and monitor drilling activities for these test borings. In addition, a representative from BETA was onsite to monitor the air quality as stipulated in the National Grid Access Agreement. No environmental soil sampling was performed at the Tidewater Site.

As required by the National Grid Access Agreement, Geologic was responsible for drumming and leaving on site investigation-derived waste (IDW) that could not be placed back into the completed borehole. After completion of drilling activities on the Tidewater Site, drilling equipment was decontaminated by steam cleaning. Steam cleaning took place on a plastic containment pad allowing the wash water to be drummed as IDW. Management and disposal of the drummed IDW will be conducted by National Grid. Below is a representative photograph of steam cleaning on the Tidewater Site.

Steam Cleaning Set up on the Tidewater Site

Test borings B-4 through B-8 were drilled in the public right-of-way on city streets and required a police detail as well as signage for traffic control. Below is a representative photograph of traffic control set up at test boring B-8.

Drilling Test Boring B-8 at the Intersection of South Main St. and Roosevelt Ave. Ext.

Test borings B-4A, B-4B, B-4C and B-6 encountered obstructions before reaching the planned termination depths. Based on review of historic area photographs at test borings B-4A and B-4B, it was determined that the obstruction was likely an existing foundation from a former building. Completed test boring B-4C was offset approximately three feet from test boring B-4B and advanced through a probable foundation approximately five feet thick.

Test boring B-6 was attempted three times in the vicinity of the entrance to the parking lot south of National Grid's Bridge Mill Power Plant. Vacuum excavation was performed at two of the three locations attempted. At each of the three locations, an unidentified obstruction was encountered at approximately four feet below the existing ground surface. As a result of encountered obstructions, test boring B-6A was relocated about 100 feet to the south of the originally planned location and drilled near the southern end of Roosevelt Avenue Extension.

To prevent the potential for creating future pathways for drilling fluids used during trenchless construction, test borings B-1 through B-3 and B-9 through B-12 were tremie grouted upon completion using a cementitious grout. Test borings B-4 through B-8 and B-13 were backfilled with a mixture of silica sand and soil cuttings generated during the drilling.

Soil samples were obtained using techniques and equipment in general accordance with the American Society for Testing and Materials (ASTM) Standard Specification D1586 Standard Penetration Tests (SPT). SPT tests were performed using a standard 1-3/8-in. I.D. split-spoon sampler. SPT blow counts were recorded for 6-in. intervals, where the SPT "N" value is defined as the number of blows required to drive the split-spoon sampler with a 140-lb. hammer falling freely through a distance of 30 in. for a distance of 12 in. counted from the 6th to the 18th inch that the sampler was driven.

Rock coring was performed using a five-foot long NX (2 in. O.D.) core barrel. The top of bedrock was estimated based on the drilling operations (e.g. excessive rig chatter, difficult drilling penetration) and

practical split-spoon refusal. Rock coring was performed in order to confirm bedrock and to assess its relative quality as indicated by Core Recovery[1] and Rock Quality Designation (RQD)[2].

Soil and rock were classified in the field using visual/manual methods, in accordance with the Unified Soil Classification System (USCS) and the NBC Phase III CSO Program Geotechnical/Environmental Investigation Work Plan Standards as practiced by McMillen Jacobs. Selected soil and rock samples were delivered to GeoTesting Express laboratory in Acton, Massachusetts, for laboratory testing.

Test boring logs are provided in Appendix A and rock coring photographs are provided in Appendix B.

Split-spoon samples were screened in the field for VOCs using a MiniRAE 3000 photoionization detector (PID). Once the soil sample from the split-spoon was collected in a sample jar, the headspace readings were obtained by opening the sample jar and immediately inserting the PID probe into the sample jar headspace to measure the VOCs present within the soil sample. PID results were recorded adjacent to the sample description on the boring logs. In addition to PID readings, any staining, visual and/or olfactory evidence of contamination were also recorded on the boring log within the sample description or as a note beneath the sample descriptions.

Four groundwater observation wells were installed in completed boreholes B-2, B-3, B-4C, and B-7, and two were installed in boreholes adjacent to completed test borings B-9 and B-10. Groundwater observation wells installed in B-2, B-3, B-4C, and B-7 required backfilling to the desired depths of the screened intervals using either grout, bentonite chips, or drill cuttings. The water level observed at the time of drilling is indicated on the test boring logs. Groundwater monitoring was performed between the period 9 September 2019 to 12 February 2020. Groundwater observation well installation and monitoring reports are provided in Appendix C.

[1] The Core Recovery is defined as the ratio (expressed as a percent) of the total length of recovered core to the length cored.
[2] The Rock Quality Designation (RQD) is defined as the sum in inches of all pieces of moderately weathered to less weathered rock core, 4 inches in length or longer, divided by the length in inches of core run (expressed as a percentage). If the core is broken by handling or drilling procedures, the pieces of core are fitted together and counted as one piece, provided they constitute the required 4-inch length.

3.0 Subsurface Investigations by Others

3.1 General

Subsurface explorations have been performed by others in the vicinity of the Project for preliminary design and to construct bridges, roadways, utilities, and conduct environmental assessments. Existing test borings, laboratory testing results, and geophysical data that were judged to be relevant to this Project have been included in this GDR. Brief descriptions of the additional information included is provided below.

Historic data is provided in Appendix D. The locations of the historic test borings are shown on Figure 2.

3.2 Previous Test Borings by Stantec/Pare

Geotechnical subsurface explorations have been performed along the Project alignment by the PM/CM in support of the overall NBC CSO Phase III Program. The following information was provided and reviewed for pertinent information:

- Report entitled "NBC CSO Phase IIIA Contract No. 308.01 C, Request for Proposal, Appendix C, Geotechnical Data Report", prepared by Stantec and Pare Corporation, dated December 23, 2019.

3.3 Tidewater Site

Geotechnical subsurface explorations have been performed across the Tidewater Site by various consultants for National Grid in support of the remediation of the site. The following information was reviewed for pertinent test boring logs:

- Report entitled "Remedial Action Work Plan National Grid Former Tidewater Facility 200 Taft Street Pawtucket, Rhode Island" prepared by GZA GeoEnvironmental, Inc.; dated June 2018.
- Report entitled "Site Investigation Data Report, Former Tidewater MGP and Power Plant Site, Pawtucket, Rhode Island, RIDEM Case No. 95-022" prepared by GZA GeoEnvironmental Inc.; dated January 2011.

3.4 Other Sources of Data

Other subsurface explorations along or adjacent to the project alignment have been performed for various purposes. The following information was reviewed for pertinent test boring logs and data:

- Drawing set entitled "State of Rhode Island and Providence Plantations, Blackstone Valley Sewer District Commission, Taft St. – Pleasant St. Branch Interceptor, Section B, Contract 18", prepared by Metcalf & Eddy Engineers, dated 1950.
- State of Rhode Island, Department of Public Works, Division of Roads and Bridges, Plan, Profile and Sections of Proposed State Highway, Division St. Project, Contract Three, Rhode Island FA Project No.1-01(11), Contract No. 5737, dated 1957.
- State of Rhode Island, Department of Transportation, Plans, Profiles, and Section of Proposed Bridge Replacement, Pawtucket Bridge No. 550, I-95 Over the Seekonk River, Volume 3 Bridge Plans, Rhode Island Contract No. 2010-CB-004, FA Project Nos.BRO-0550(003), IM-0550(004), IMG-0550(005), prepared by Commonwealth Engineers & Consultants Inc., dated April 2010.

4.0 LABORATORY TESTING

4.1 General

A program of geotechnical laboratory testing was performed on selected soil and rock samples collected during the exploration program. Laboratory testing was conducted at the GeoTesting Express geotechnical laboratory, located in Acton, Massachusetts.

A summary of the completed laboratory testing, indicating the number of tests conducted in each exploration, is provided in Table 2. Individual testing results are provided in Appendix E.

4.2 Soil Testing

4.2.1 Grain Size Distribution

A total of nineteen (19) mechanical grain size distribution tests were performed in accordance with ASTM International Standard D421. The results of the grain size analyses were used to confirm field determined soil classifications and material characteristics.

4.3 Rock Testing

4.3.1 Unconfined Compressive Strength

Two unconfined compression strength (UCS) tests were performed on rock core samples in general accordance with ASTM International Standard D7012.

4.3.2 Cerchar Abrasivity Index

Two Cerchar Abrasivity Index (CAI) tests were performed on rock core samples in general accordance with ASTM International Standard D7625. The CAI gives an indication of potential wear of rock excavation equipment.

4.3.3 Brazilian Tensile Strength

Two Brazilian tensile strength (splitting tensile strength) tests were performed on rock core samples in general accordance with ASTM International Standard D3967.

5.0 Limitations

This report has been prepared for specific application to the proposed Consolidation Conduits IIIA-4 and IIIA-5 of the NBC Phase III CSO Program in Pawtucket, Rhode Island, in accordance with generally accepted geotechnical engineering practice.

The data presented herein are based, in part, on information from subsurface explorations that are available to us at this time obtained for design of the proposed facilities. The nature and extent of variations in the subsurface conditions between explorations may vary.

The scope of work undertaken for this GDR does not include a site assessment for the presence of oil or hazardous materials, nor did it include an evaluation of the impact of oil and hazardous materials, if present, to the project, nor any regulatory interaction and remedial activities associated with any contaminated soil, water, or materials that may exist on the site. Observations regarding the presence of oil or hazardous materials were made by McMillen Jacobs on a qualitative basis during drilling of the test borings.

TABLES

TABLE 1
Summary of Subsurface Exploration Program
NBC Phase III CSO Program
Consolidation Conduits IIIA-4 and IIIA-5
Pawtucket, RI

Test Boring Designation	Total Drilled Depth (ft)	Depth Drilled in Soil (ft)	Depth Drilled in Rock (ft)	Observation Well Installed
B-1[1]	22.0	10.0	12.0	
B-2[1]	34.0	29.0	5.0	1
B-3[1]	37.0	27.0	10.0	1
B-4A[2]	8.9	8.9	n/e[3]	
B-4B[2]	10.0	10.0	n/e	
B-4C	35.0	29.5	5.5	1
B-5	35.0	27.0	8.0	
B-6[2]	4.0	4.0	n/e	
B-6A[1]	31.0	26.0	5.0	
B-7	29.2	29.2	n/e	1
B-8[1]	25.0	16.0	9.0	
B-9[1]	39.0	29.0	10.0	1
B-10[1]	31.0	21.0	10.0	1
B-11[1]	39.0	29.0	10.0	
B-12[1]	51.0	29.0	22.0	
B-13[1]	21.0	21.0	n/e	
Totals	**452.1**	**345.6**	**106.5**	**6**

Notes

1. Test borings B-1, B-2, B-3, B-6A, and B-8 through B-13 were vacuum excavated to a depth of about 6 feet below the existing ground surface.

2. Test borings B-4A, B-4B, and B-6 encountered obstructions and were terminated before reaching the planned total depth.

3. "n/e" means not encountered.

TABLE 2
Summary of Laboratory Testing Program
NBC Phase III CSO Program
Consolidation Conduits IIIA-4 and IIIA-5
Pawtucket, RI

Test Boring Designation	Sample ID	Sample Depth (ft)	Soil Testing[1]	Rock Testing[2]		
			Sieve	Cerchar	Brazilian Tensile Strength	Unconfined Compression Strength
B-1	S-1	6-8	1			
B-2	S-3	10-12	1			
B-2	S-7	18-20	1			
B-3	S-2	14-16	1			
B-3	S-5	25-27	1			
B-4C	S-2	14-16	1			
B-4C	S-3b	19-21	1			
B-5	S-4	6-8	1			
B-5	S-8	19-21	1			
B-6A	S-5	19-21	1			
B-7	S-5	8-10	1			
B-7	S-7	14-16	1			
B-8	S-3	10-12	1			
B-9	S-4	17-19	1			
B-9	S-6	21-23	1			
B-9	C-1	29.9-30.3		1	1	1
B-10	S-6	16-18	1			
B-10	C-1	22.3-22.7		1	1	1
B-11	S-7	19-21	1			
B-12	S-7	27-29	1			
B-13	S-2a	8-10	1			
		Totals	**19**	**2**	**2**	**2**

Notes
1. Laboratory soil testing performed in general accordance with ASTM International Standard D421.
2. Laboratory rock testing performed in general accordance with ASTM International Standards D7625, D3967, and D7012C.

FIGURES

PROJECT LOCUS

PROJECT 5980

McMILLEN JACOBS ASSOCIATES

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

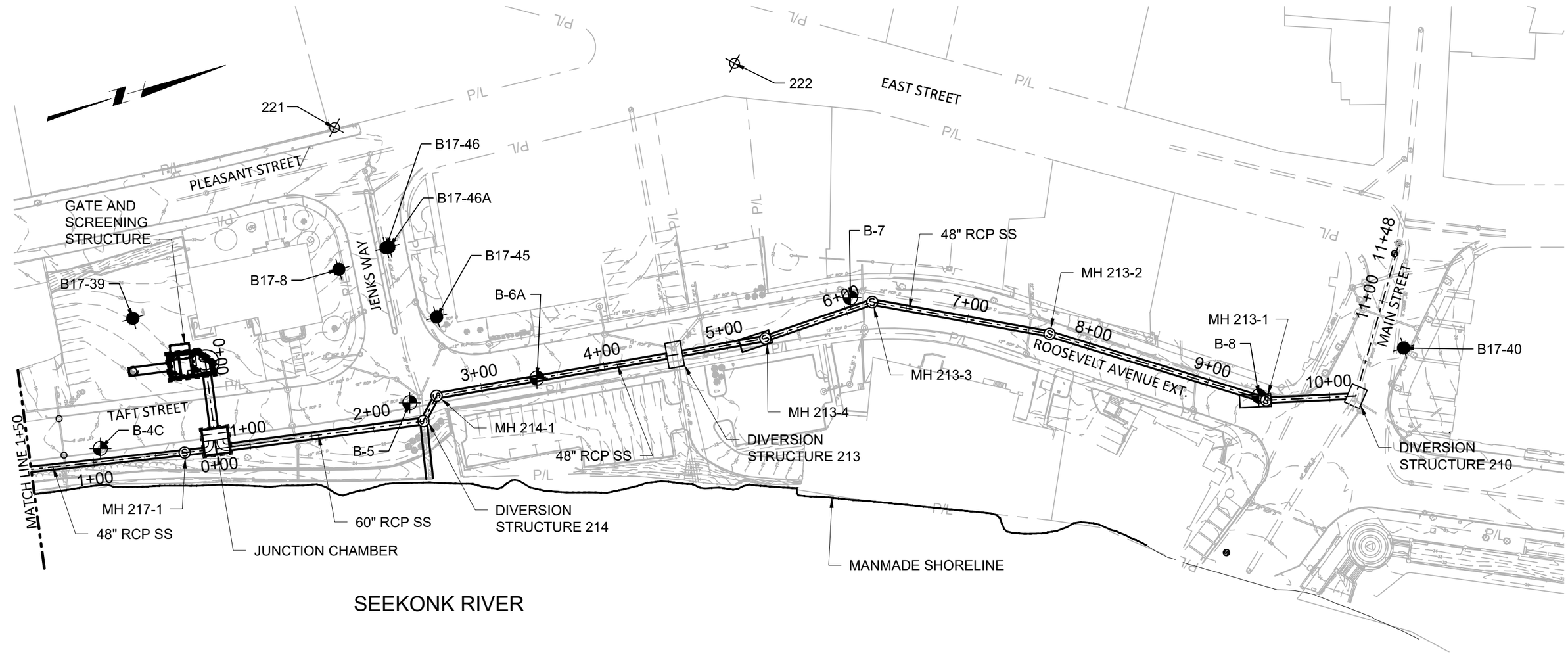
Stantec

PARE

NBC PHASE III CSO PROGRAM
CONSOLIDATION CONDUITS PHASE IIIA-4 AND IIIA-5
PROJECT LOCUS
PAWTUCKET, RHODE ISLAND

DATE
MAY, 2020

FIGURE
1



PLAN

SCALE: 1"=80'

0 80' 160'

NOTE: SEE FIGURE 2E FOR LEGEND AND NOTES.

PROJECT 5980

McMILLEN JACOBS ASSOCIATES

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Narragansett Bay Commission

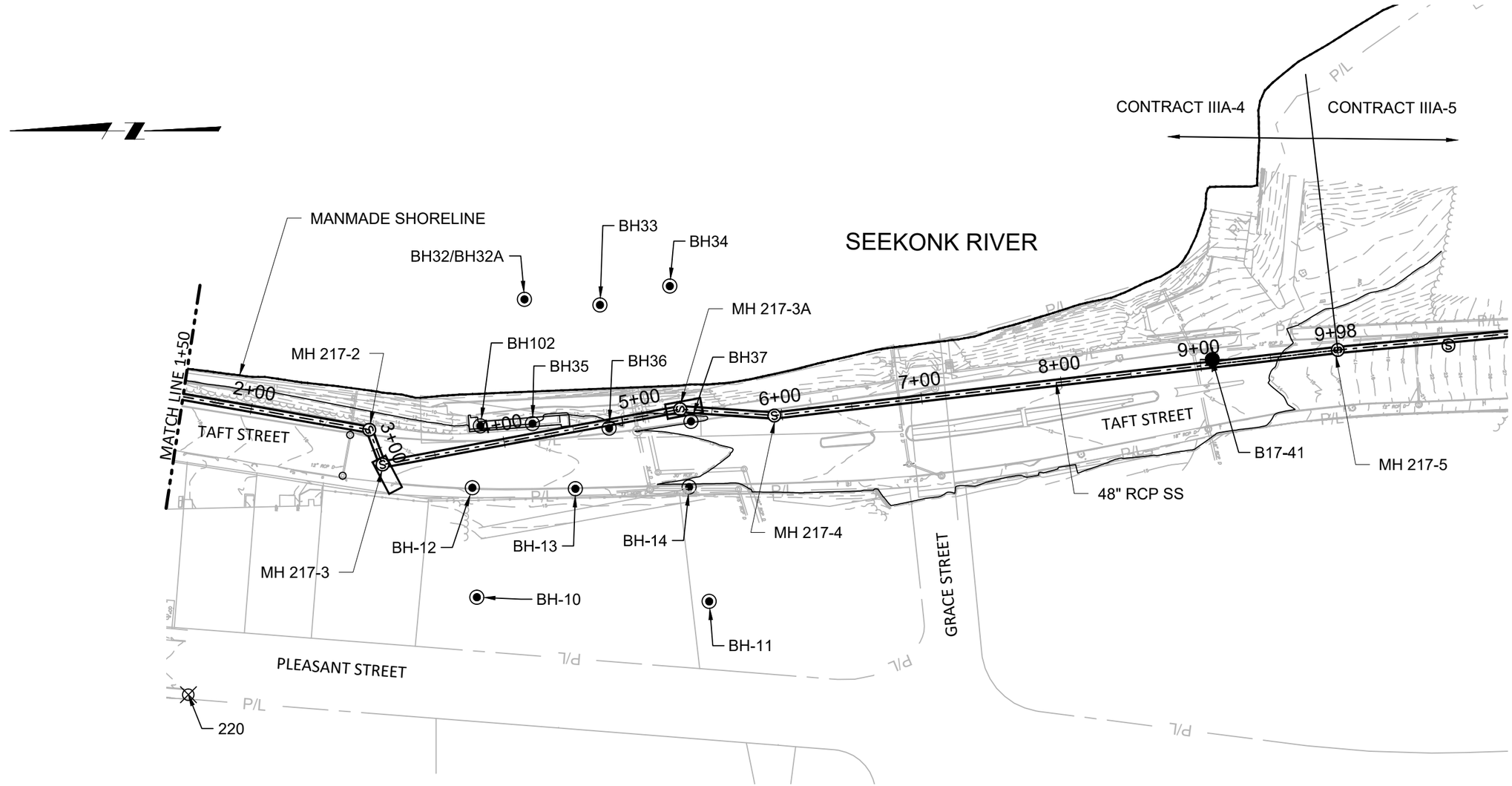
Stantec

PARE

NBC PHASE III CSO PROGRAM
CONSOLIDATION CONDUITS PHASE IIIA-4 AND IIIA-5
SITE AND SUBSURFACE EXPLORATION PLAN
ALIGNMENT IIIA-4 (SHEET 1 OF 2)

DATE
MAY, 2020

FIGURE
2A



PLAN

SCALE: 1"=80'

0 80' 160'

NOTE: SEE FIGURE 2E FOR LEGEND AND NOTES.

PROJECT 5980

McMILLEN JACOBS ASSOCIATES

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Narragansett Bay Commission

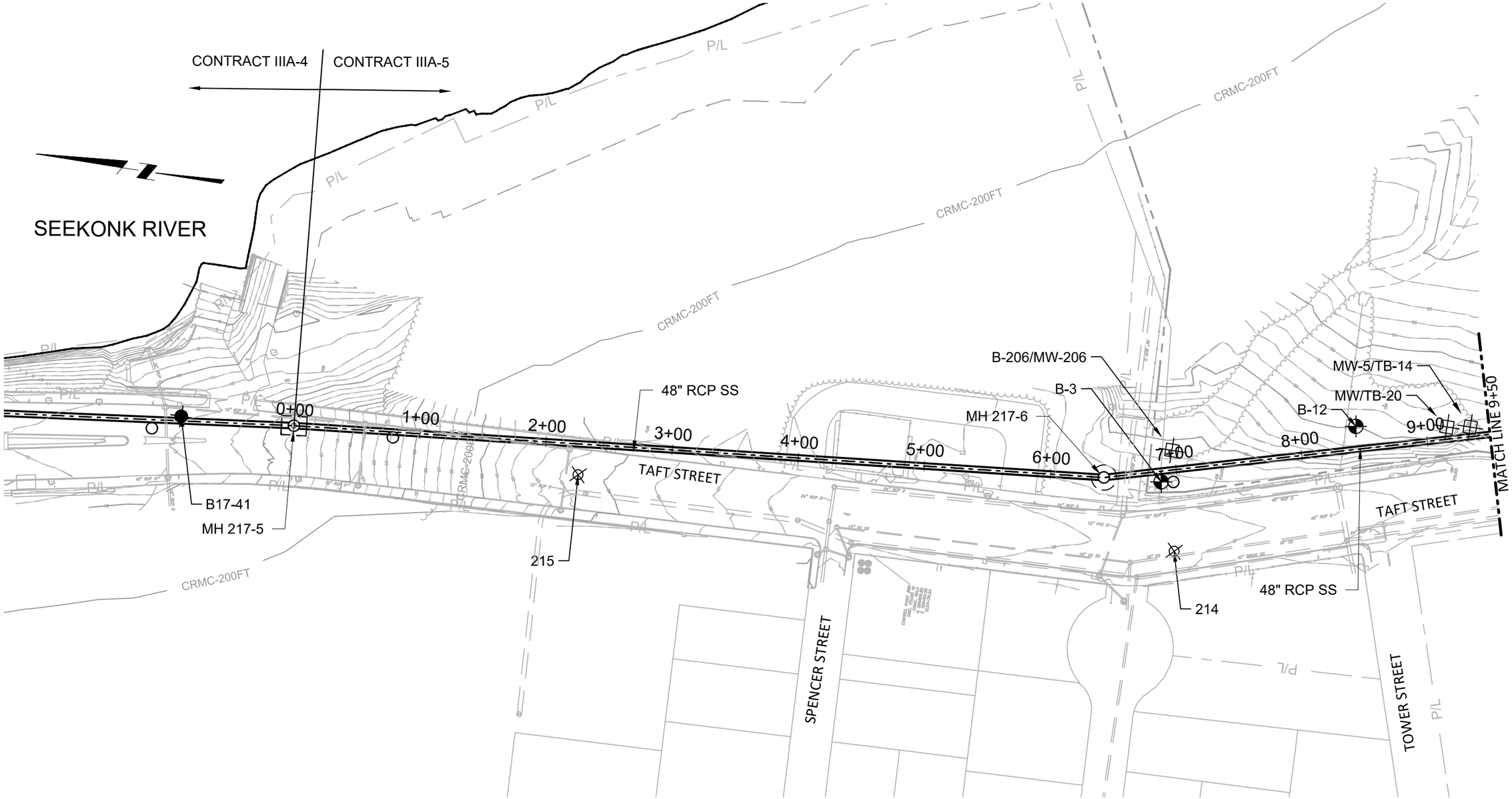
Stantec

PARE

NBC PHASE III CSO PROGRAM
CONSOLIDATION CONDUITS PHASE IIIA-4 AND IIIA-5
SITE AND SUBSURFACE EXPLORATION PLAN
ALIGNMENT IIIA-4 (SHEET 2 OF 2)

DATE
MAY, 2020

FIGURE
2B



PLAN

SCALE: 1"=80'

0 80' 160'

NOTE: SEE FIGURE 2E FOR LEGEND AND NOTES.

PROJECT 5980

McMILLEN JACOBS ASSOCIATES

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

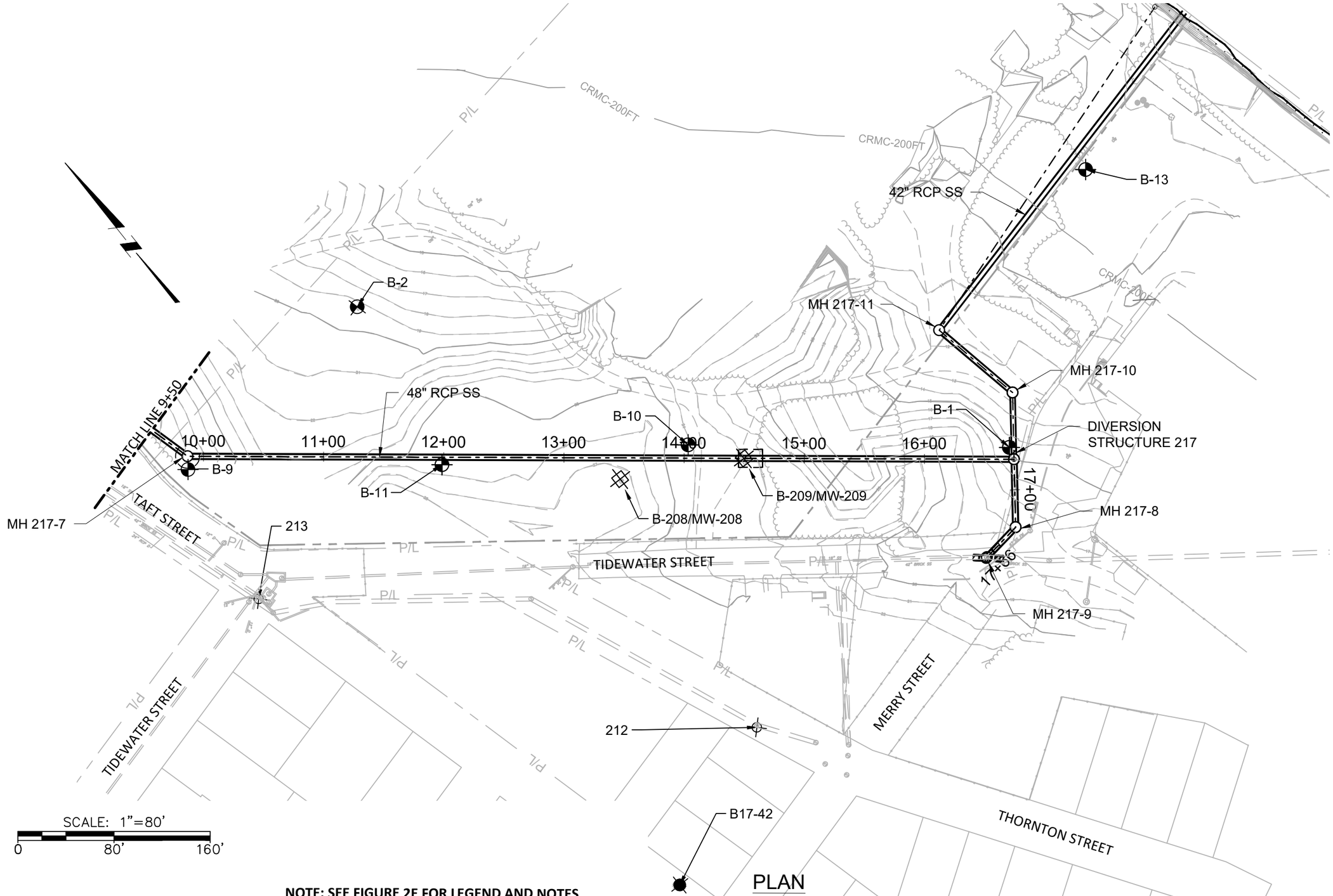
Stantec

PARE

NBC PHASE III CSO PROGRAM
CONSOLIDATION CONDUITS PHASE IIIA-4 AND IIIA-5
SITE AND SUBSURFACE EXPLORATION PLAN
ALIGNMENT IIIA-5 (SHEET 1 OF 2)

DATE
MAY, 2020

FIGURE
2C



PLAN

NOTE: SEE FIGURE 2E FOR LEGEND AND NOTES.

PROJECT 5980

McMILLEN JACOBS ASSOCIATES

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Narragansett Bay Commission

Stantec

PARE

NBC PHASE III CSO PROGRAM
CONSOLIDATION CONDUITS PHASE IIIA-4 AND IIIA-5
SITE AND SUBSURFACE EXPLORATION PLAN
ALIGNMENT IIIA-5 (SHEET 2 OF 2)

DATE
MAY, 2020

FIGURE
2D

LEGEND

B-7	DESIGNATION AND LOCATION OF TEST BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIODS 27 AUGUST THROUGH 18 SEPTEMBER AND 04 FEBRUARY THROUGH 12 FEBRUARY UNDER THE SUPERVISION OF MCMILLEN JACOBS ASSOCIATES.
BH-35	DESIGNATION AND LOCATION OF TEST BORING PERFORMED FOR THE PAWTUCKET BRIDGE AND PAWTUCKET BRIDGE REPLACEMENT PERFORMED IN 1955 AND 2010.
B17-39	DESIGNATION AND LOCATION OF TEST BORING PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. PERFORMED BETWEEN 04 MAY 2018 AND 08 AUGUST 2019 UNDER THE SUPERVISION OF PARE CORPORATION.
221	DESIGNATION AND LOCATION OF TEST BORING PERFORMED FOR THE TAFT ST. - PLEASANT ST. BRANCH INTERCEPTOR SECTION B DATED 1950.
MW/TB-20	DESIGNATION AND LOCATION OF PREVIOUS TEST BORING CONDUCTED ON THE FORMER TIDEWATER FACILITY.

NOTES

1. BASE PLAN USED FOR FIGURES 2A, 2B AND PART OF 2C WAS A CAD-GENERATED DRAWING TITLED “PAWT_SITE_PLAN_&_PROFILE_IIIA-4” PREPARED BY BETA GROUP, INC. AND OBTAINED ON 2/24/2020 BY MCMILLEN JACOBS ASSOCIATES VIA PROJECTWISE SHAREPOINT.
2. BASE PLAN USED FOR PART OF FIGURE 2C AND 2D WAS A CAD-GENERATED DRAWING TITLED “PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3 ” PREPARED BY BETA GROUP, INC. AND OBTAINED ON 2/24/2020 BY MCMILLEN JACOBS ASSOCIATES VIA PROJECTWISE SHAREPOINT.
3. AS DRILLED LOCATIONS OF THE B-SERIES TEST BORINGS CONDUCTED IN 2019 AND 2020 WERE SURVEYED BY BRYANT AND ASSOCIATES, INC. IN NOVEMBER 2019 AND FEBRUARY 2020 AND PROVIDED TO MCMILLEN JACOBS ASSOCIATES BY BETA GROUP, INC.
4. ALL ELEVATIONS ARE IN FEET AND REFER TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NVGD29).
5. NORTH ARROW ALIGNED WITH GRID NORTH, RHODE ISLAND STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (NAD83).
6. REFER TO THE APPENDICES OF THIS REPORT FOR TEST BORING LOGS AND GROUNDWATER INSTALLATION AND MONITORING REPORTS.

PROJECT 5980

McMILLEN JACOBS ASSOCIATES

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec

PARE

NBC PHASE III CSO PROGRAM
CONSOLIDATION CONDUITS PHASE IIIA-4 AND IIIA-5
SITE AND SUBSURFACE EXPLORATION PLAN
LEGEND AND NOTES (SHEET 1 OF 1)

DATE
MAY, 2020

FIGURE
2E

APPENDICES

APPENDIX A
Test Boring Logs

SOIL

Soil description on logs of subsurface explorations are based on Standard Penetration Test (SPT) results, visual-manual examination of exposed soil samples, and the results of laboratory tests on selected samples. The criteria, descriptive terms, and definitions are presented herein.
The natural soils are identified and described by visual-manual procedures (ASTM D2488) and in accordance with the United Soil Classification System (USCS) (ASTM D2487) as practiced by McMillen Jacobs Associates. Fill materials may not be classified by USCS criteria.

PENETRATION RESISTANCE

Standard penetration resistance (SPT) (ASTM D1586) - Number of blows required to drive a standard 2 in. O.D. split spoon sampler one foot with a 140 lb. weight falling 30 inches freely downward.

DENSITY / CONSISTENCY

Coarse - Grained Soils	
Apparent Density	SPT Resistance, N (BPF)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

Fine - Grained Soils	
Apparent Consistency	SPT Resistance, N (BPF)
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

Notes: BPF = Blows Per Foot (uncorrected)

WOR = Weight of Rod

COLOR

Basic colors (black, brown, gray, olive, red, and yellow) and combinations (i.e. gray-brown, olive-brown, olive-gray, red-gray, red-brown, yellow-brown, and red-yellow). Modifiers such as light and dark may be used.

SUPPLEMENTAL SOIL DESCRIPTIONS AND STRUCTURE:

Laminating	- 0 to 1/16 in. thick (cohesive)
Parting	- 0 to 1/16 in. thick (granular)
Seam	- 1/16 to 1/2 in. thick
Layer	- 1/2 to 12 in. thick
Stratum	- > 12 in. thick
Pocket	- Small, erratic deposit less than 12 in. size
Lens	- Lenticular deposit larger than a pocket
Occasional	- One or less per 12 in. of thickness
Frequent	- More than one per 12 in. of thickness
Interbedded	- Alternating soil layers of differing composition
Varved	- Alternating thin seams of silt and clay
Mottled	- Variation of color

SAMPLE SYMBOLS

- SPT Sample 2 in. OD
- X SPT Sample 3 in. OD
- Shelby Tube Sample

ADDITIONAL GRAPHIC DESCRIPTIONS

- Asphalt
- Fill

SOIL IDENTIFICATION AND DESCRIPTION

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS Based on ASTM D2488 & D2487)

MAJOR DIVISIONS			GROUP/SYMBOL	TYPICAL DESCRIPTION
COARSE-GRAINED SOILS (50% or more retained on No. 200 sieve)	GRAVELS (more than 50% retained on No. 4 sieve)	CLEAN GRAVELS (less than 5% fines)	GW	WELL-GRADED GRAVEL
			GP	POORLY GRADED GRAVEL
		GRAVELS (with 5 to 12% fines)	GW-GM	WELL-GRADED GRAVEL WITH SILT
			GW-GC	WELL-GRADED GRAVEL WITH CLAY
			GP-GM	POORLY GRADED GRAVEL WITH SILT
			GP-GC	POORLY GRADED GRAVEL WITH CLAY
		GRAVELS WITH FINES (more than 12% fines)	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SANDS (less than 50% retained on No. 4 sieve)	CLEAN SANDS (less than 5% fines)	SW	WELL-GRADED SAND
			SP	POORLY GRADED SAND
		SANDS (with 5 to 12% fines)	SW-SM	WELL-GRADED SAND WITH SILT
			SW-SC	WELL-GRADED SAND WITH CLAY
			SP-SM	POORLY GRADED SAND WITH SILT
			SP-SC	POORLY GRADED SAND WITH CLAY
		SANDS WITH FINES (more than 12% fines)	SM	SILTY SAND
			SC	CLAYEY SAND
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS & CLAYS (liquid limit less than 50)	INORGANIC	ML	SILT
			CL	LEAN CLAY
		ORGANIC	OL	LOW PLASTICITY ORGANIC CLAY
	SILTS & CLAYS (liquid limit greater than 50)	INORGANIC	MH	ELASTIC SILT
			CH	FAT CLAY
		ORGANIC	OH	HIGH PLASTICITY ORGANIC CLAY
	SILT/CLAY (liquid limit between 12 and 25)	INORGANIC	CL-ML	CLAYEY SILT / SILTY CLAY
HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT	PEAT

Notes:

1. Dual symbols (symbols separated by a hyphen, e.g. SP-SM, slightly silty fine SAND) are used for soils between 5% and 12% fines or when liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

ROCK

Rock descriptions noted on logs of subsurface explorations are based on visual-manual examination of exposed rock outcrops and core samples. The criteria, descriptive terms and definitions used are as follows:

FIELD HARDNESS / STRENGTH

(after ISRM, 1978; CGS, 1985; Marinos & Hoek, 2001)

Extremely Strong	Cannot be scratched with a knife point or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Strong	Cannot be scratched with a knife point or sharp pick; core breaks with repeated heavy hammer blows.
Strong	Can be scratched with a knife or pick; core breaks with heavy hammer blow.
Moderately Weak	Can be grooved 1/16 in. deep by knife or sharp pick; core breaks with light hammer blow.
Weak	Can be grooved easily with a knife or pick; can be scratched with fingernail; core breaks with light pressure.
Very Weak	Can be readily indented; grooved with fingernail or carved with a knife; core beaks with light pressure.

WEATHERING (after ISRM, 1978)

The action of organic and inorganic chemical and physical processes resulting in alteration of color, texture, and composition

Fresh	No visible sign of alteration, except perhaps slight discoloration on major discontinuity surfaces
Slight	Discoloration of rock material and discontinuity surfaces
Moderate	Less than half the rock material decomposed to soil. Some fresh rock; continuous "framework".
High	More than half the rock material decomposed and/or disintegrated to soil.
Completely	All rock material disintegrated to soil, but mass still intact
Residual Soil	All rock material converted to soil. Material has not been significantly transported.

COLOR:

Basic colors and combinations: gray, light gray, brown, red-brown

TEXTURE

Size, shape and arrangements of constituents

Aphantic	Individual grains invisible
Fine-grained	Grains barely visible to the unaided eye, up to 1/16 in. dia.
Medium Grained	Grains between 1/16 and 3/16 in. dia.
Coarse Grained	Grains between 3/16 and 1/4 in. dia.
Very Coarse Grained	Grains larger than 1/4 in. dia.

LITHOLOGY

Rock Classification and modifiers; accepted formation names

DISCONTINUITIES:

Type	Definition
Joint	A natural fracture along which no displacement has occurred. May occur in parallel groups called sets.
Shear	A natural fracture along which displacement has occurred. Surface may be slickensided or striated.
Fault	A natural fracture along which displacement has occurred. Usually lined with gouge and slickensides.
Shear or Fault Zone	Zone of fractured rock and gouge bordering the displacement plane.

ORIENTATION / ATTITUDE

Term	Angle (degrees)
Horizontal	0-5
Low Angle	6-35
Moderately Dipping	36-55
High Angle	56-85
Vertical	86-100

SPACING

Term	Inches
Extremely Close	<3/4
Very Close	3/4 - 2-1/2
Close	2-1/2 - 8
Moderate	8 - 24
Wide	24 - 80
Very Wide	80- 20 ft.
Extremely Wide	> 20 ft.

ROUGHNESS OF DISCONTINUITY SURFACE

Term	Abbreviation	Description
Very Rough	VR	Near-vertical steps and ridges
Rough	R	Ridges, side-steps, and asperities evident; abrasive to the touch
Slightly Rough	SR	Asperities can be felt.
Smooth	SM	Smooth to the touch
Slickensided	SL	Smooth glossy finish with visible striations

APERTURE/GAP

Term	MM
Very Tight	< .1
Tight	0.1 - 0.25
Partly Open	0.25 - 0.5
Open	0.5 - 2.5
Moderately Wide	2.5 - 10
Wide	> 10
Very Wide	10 - 100
Extremely Wide	100 - 1000
Cavernous	> 1000

INFILLING

Material	Abbreviation
Clay	CL
Silt	SI
Sand	SA
Serpentine	SE
Sulfide	SL
Calcite	CA
Pyrite	PY
Quartz	QZ
Chlorite	CH
Iron Oxide Staining	FE
Could not be determined	X

BEDDING

Term	Inches	Term	Inches
Very Thin	< 2.5	Thick	25-36
Thin	2.5 - 8	Very Thick	< 36
Medium	9 - 24		

GENERAL NOTES:

1. Logs of subsurface exploration depict soil, rock and groundwater conditions only at the boring locations specified on the dates indicated. Subsurface conditions may vary at other locations and at other times.
2. Water levels, where noted on the logs, were measured at the times under the conditions indicated. During test boring drilling, these water levels could have been affected by the introduction of water in to the borehole, extraction of tools or other procedures and thus may not reflect actual groundwater levels at the test boring location. Groundwater level fluctuations may also occur as a results of variations in precipitation, temperature, season, tides, river stage, adjacent construction operations, construction dewatering systems, water supply well pumping, and other conditions.

McMILLEN JACOBS ASSOCIATES

SUBSURFACE EXPLORATION KEY

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-1

Date(s) Drilled	09/05/2019 - 09/06/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	22.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	14.5 ft / NGVD 1929		
Location	Southerly end of Tidewater Site	Coordinates	360205.11E,285935.78N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
10		5								
			6-8	S-1	13/24	18-18-17-20 (N=35)	SM		Moist, dense, brown, fine SAND and gravel, little silt (FILL)	PID=0
			8-10	S-2	10/24	14-30-22-19 (N=52)	SP-SM		Moist, very dense, brown, fine SAND, some gravel (FILL)	
5		10								
									Top of possible boulder/bedrock. See Core Boring Report for rock details.	
0	▽	15								
			15-16.9	S-3	14/23	16-27-31-50/5" (N=58)	SW-SM		Wet, very dense, gray, SAND, some gravel and silt (Completely Weathered Bedrock)	PID=30
-5									See Core Boring Report for Rock Details	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-1

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-1

Date(s) Drilled:	09/05/2019 - 09/06/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	22.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	14.5 ft / NGVD 1929		
Location:	Southerly end of Tidewater Site	Coordinates:	360205.11E,285935.78N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
			4						See Test Boring Report for Overburden Details							
			4													
		10-15	3	2	C-1	24/ 40%	20/ 33%		Strong, gray, moderately weathered, medium-grained CONGLOMERATE. Mechanical breaks at 10.5 ft, 11.3 ft, and 11.8 ft.							
			1													
0			2													
	15								Sample obtained using split spoon sampler. See Test Boring Report for details.							
			2							17.3	J	30	S	1.00	FR	
		17-22	2	2	C-2	45/ 75%	17/ 28%		Strong, gray, moderately weathered, fine-grained SILTSTONE	18.8	J	30	SR	1.00	FR	
										19.1	J	40	SR	1.00	FR	
-5			2							19.8	J	40	SR	1.00	FR	

McMILLEN JACOBS ASSOCIATES

Boring B-1

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-1

Date(s) Drilled:	09/05/2019 - 09/06/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	22.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	14.5 ft / NGVD 1929		
Location:	Southerly end of Tidewater Site	Coordinates:	360205.11E,285935.78N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		17-22	6 5	2	C-2	45/ 75%	17/ 28%		Strong, gray, moderately weathered, fine-grained SILTSTONE	20.0 20.1	J J	30 30	SR R	5.00 5.00	FR FR	
-10	25								Bottom of borehole at 22.0 ft.							
-15																

McMILLEN JACOBS ASSOCIATES

Boring B-1

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-2

Date(s) Drilled	09/03/2019 - 09/05/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	34.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	22.2 ft / NGVD 1929		
Location	Tidewater Site	Coordinates	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
18		5								
			6-8	S-1	24/24	2-1-2-4 (N=3)	CL		Moist, soft, grayish brown, silty CLAY (FILL)	PID=20
13			8-10	S-2	18/24	1-1-0-3 (N=1)	ML		Moist, very soft, gray, SILT (FILL)	PID=32
	▽	10	10-12	S-3	12/24	1-4-1-17 (N=5)	ML		Wet, medium stiff, light gray, SILT, some gravel, little fine sand (FILL)	PID=50
			12-14	S-4	12/24	9-6-7-12 (N=13)	SP		Wet, medium dense, brown, medium SAND some gravel, little silt (FILL)	PID=20
8		15	14-16	S-5	8/24	8-8-5-8 (N=13)	SW-SM		Wet, medium dense, brown, coarse to fine SAND, some gravel, trace fines (ALLUVIUM)	PID=3
			16-18	S-6	20/24	7-3-3-11 (N=6)	ML		Wet, medium stiff, light brown, SILT, some fine sand (ALLUVIUM)	PID=0
3			18-20	S-7	9/24	9-7-6-9 (N=13)			Wet, medium dense, brown, fine to medium SAND, some silt (ALLUVIUM)	PID=0

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-2

Date(s) Drilled	09/03/2019 - 09/05/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	34.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	22.2 ft / NGVD 1929		
Location	Tidewater Site	Coordinates	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
							SM		Wet, medium dense, brown, fine to medium SAND, some silt (ALLUVIUM)	Occasional rig chatter starting at 21'
-2		25	24-26	S-8	6/24	9-8-8-8 (N=16)	SC		Wet, medium dense, gray and brown SAND, some clay, little gravel (GLACIAL TILL)	
-7		30	29-29	S-9	0/0	50/0"			Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-12		35								
-17										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-2

Date(s) Drilled:	09/03/2019 - 09/05/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	34.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	22.2 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
-2	25								See Test Boring Report for Overburden Details							
-7		29-34	5	1	C-1	56/ 93%	36/ 60%		Strong, fresh, gray, medium-grained SANDSTONE	29.5	J	40	SR	1.00	FR	

McMILLEN JACOBS ASSOCIATES

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-2

Date(s) Drilled:	09/03/2019 - 09/05/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	34.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	22.2 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
			4							30.7	J	40	SR	5.00	FR	
			4							31.2	J	40	S	1.00	FR	
										31.6	J	20	S	5.00	FR	
										31.8	J	30	S	1.00	FR	
		29-34		1	C-1	56/ 93%	36/ 60%		Strong, fresh, gray, medium-grained SANDSTONE	32.0	J	20	SR	1.00	FR	
			4							32.8	J	20	SR	1.00	SL	
										32.9	J	20	S	1.00	FR	
										33.0	J	20	S	1.00	FR	
										33.2	J	10	S	1.00	FR	
			4							33.3	J	40	SR	5.00	FR	
										33.5	J	20	S	1.00	FR	
										33.7	J	20	R	5.00	SL	
-12									Bottom of borehole at 34.0 ft.							
	35															
-17																

McMILLEN JACOBS ASSOCIATES

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-3

Date(s) Drilled	09/06/2019 - 09/09/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	37.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	37.4 ft / NGVD 1929		
Location	Northwestern corner of Tidewater Site	Coordinates	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
33		5								
									Drilled from 6 to 8 ft without sampling (FILL)	Rig Chatter/Slow Drilling
			8-10	S-1	19/24	15-35-20-19 (N=55)				PID=0
28		10					SP-SM		Moist, very dense, brown, SAND, little gravel and silt. Fragments of brick. (FILL)	
23	▽	15	14-16	S-2	9/24	14-10-9-8 (N=19)				PID=0
							SM		Wet, medium dense, tan, coarse to fine SAND, trace gravel and fines (ALLUVIUM)	
18									Wet, medium dense, tan, coarse to fine SAND, trace gravel and fines (ALLUVIUM)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-3

Date(s) Drilled	09/06/2019 - 09/09/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	37.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	37.4 ft / NGVD 1929		
Location	Northwestern corner of Tidewater Site	Coordinates	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	19-21	S-3	9/24	10-9-9-9 (N=18)	SM		Wet, medium dense, tan, coarse to fine SAND, trace gravel and fines (ALLUVIUM)	PID=0
13	23-25	S-4	10/24	15-21-26-38 (N=47)	CL-GC		Wet, hard, brown, sandy CLAY and coarse to fine gravel (GLACIAL TILL)	PID=0
25	25-27	S-5	13/24	16-34-34-28 (N=68)	SM-GM		Wet, very dense, brown, SAND and gravel, little silt (GLACIAL TILL)	PID=0
8 30 3 35 -2							Top of Bedrock at 27.0 ft. See Core Boring Report for rock details.	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-3

Date(s) Drilled:	09/06/2019 - 09/09/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	37.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	37.4 ft / NGVD 1929		
Location:	Northwestern corner of Tidewater Site	Coordinates:	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
13	25								See Test Boring Report for Overburden Details							
			3						Recovered material described as follows: Strong, slightly weathered, purple, fine-grained SILTSTONE. No water return while coring run C-1.	27.3	J	30	SR	1.00	FR
										27.4	J	30	SR	1.00	FR
		27-32	1	2	C-1	22/ 37%	14/ 24%			28.4	J	20	SR	1.00	FR
8			2													

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-3

Date(s) Drilled:	09/06/2019 - 09/09/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	37.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	37.4 ft / NGVD 1929		
Location:	Northwestern corner of Tidewater Site	Coordinates:	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		27-32	1 2	2	C-1	22/ 37%	14/ 24%		Recovered material described as follows: Strong, slightly weathered, purple, fine-grained SILTSTONE. No water return while coring run C-1.							
3	35	32-37	2 2 2 1 4	2	C-2	16/ 27%	0/ 0%		Recovered material described as follows: Strong, slightly weathered, purple to gray, fine-grained SILTSTONE. No water return while coring run C-2.							
-2									Bottom of borehole at 37.0 ft.							

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4A

Date(s) Drilled	08/28/2019 - 08/28/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	8.9 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates		Elevation Source	Google Earth		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	13/18	23-24-30 (N=54)	SP		Moist, very dense, reddish brown, coarse to fine SAND, little gravel (FILL)	PID=0
			2-4	S-2	10/24	23-26-21-16 (N=47)	SP-SM		Moist, dense, gray, medium to fine SAND, some gravel, little fines (FILL)	PID=0
15	▽	5	4-6	S-3	10/24	19-19-10-5 (N=29)	ML-SM		Wet, very stiff, light brown, medium to fine sandy SILT, little gravel. Fragments of brick and glass. (FILL)	PID=0
			6-8	S-4	6/24	5-5-6-13 (N=11)	SP-SM		Wet, medium dense, dark brown, medium to fine SAND, some gravel, trace fines (FILL)	
			8-8.9	S-5	4/11	71-50/5" (N=50/5")	SP-SM		Wet, very dense, light brown, coarse to fine SAND, some gravel, trace silt. Pieces of concrete. (FILL)	PID=0
10		10							Bottom of borehole at 8.9 ft.	
									Pieces of possible concrete in tip of sampler. Relocated to new location at Boring B-4B.	
5		15								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4B

Date(s) Drilled	08/28/2019 - 08/28/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	10.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates		Elevation Source	Google Earth		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
15		5							No sampling from 0 to 8 ft (FILL)	Offset hole about 1 ft from B-4A and continued drilling and sampling from 8 ft below ground surface.
	▽		8-10	S-1	14/24	15-12-14-23 (N=26)	SP-SM		Wet, medium dense, light brown, medium to fine SAND, some gravel, trace fines (FILL)	PID=0
10		10							Bottom of borehole at 10.0 ft. Pieces of possible concrete in tip of sample. Relocated to new location at Boring B-4C.	
5		15								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4B

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4C

Date(s) Drilled	08/29/2019 - 08/29/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates	359477.61E,288205.01N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
15		5							No sampling from 0 to 9.5 ft (FILL)	Offset hole about 3 ft from B-4B and continued drilling and sampling from 9.5 ft below ground surface. Occasional rig chatter from 0 to 9.5 ft.
10		10	9.5-11.5	S-1	14/24	18-18-29-23 (N=47)	SP		Dry, dense, light brown, coarse to fine SAND, some gravel, trace fines. Possible concrete. (FILL)	PID=0
5		15	14-16	S-2	10/24	15-10-10-15 (N=20)	SP-SM		Moist, dense, light brown, coarse to fine SAND, little gravel, trace fines (FILL)	PID=0
	▽						GP		Wet, dense, dark brown, GRAVEL, little sand, trace fines (FILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4C

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4C

Date(s) Drilled	08/29/2019 - 08/29/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates	359477.61E,288205.01N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
			19-21	S-3	14/24	10-23-18-12 (N=41)	ML-SM		Wet, hard, red, SILT and fine to medium SAND, trace gravel (GLACIOFLUVIAL)	PID=0
-5		25	24-26	S-4	13/24	38-29-20-16 (N=49)	GP-GM		Wet, dense, gray, coarse to fine GRAVEL, little sand (GLACIAL TILL)	PID=0 Rig Chatter
			29-29.5	S-5	6/6	70-50/0"	ML		Wet, very stiff, gray, sandy SILT, little gravel (GLACIAL TILL)	
-10		30							Top of Bedrock at 29.5 ft. See Core Boring Report for rock details.	
-15		35								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4C

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-4C

Date(s) Drilled:	08/29/2019 - 08/29/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	35.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	19.9 ft / NGVD 1929		
Location:	Taft St north of I-95 bridge	Coordinates:	359477.61E,288205.01N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
			3						See Test Boring Report for Overburden Details							
			4													
		30-35	4	1	C-1	60/ 100%	26/ 43%		Strong, slightly weathered, purple, fine-grained SILTSTONE							
			4							33.4	J	40	S	1.00	FR	
										33.5	J	40	SR	1.00	FR	
			4							34.2	J	50	SR	1.00	FR	
										34.5	J	40	SR	1.00	FR	
-15	35									34.6	J	10	S	1.00	FR	
									Bottom of borehole at 35.0 ft.							
-20																

McMILLEN JACOBS ASSOCIATES

Boring B-4C

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-5

Date(s) Drilled	08/27/2019 - 08/27/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	26.8 ft / NGVD 1929		
Location	Intersection of Taft St. and Jenks Way	Coordinates	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	14/18	44-30-30 (N=60)	SM		Dry, very dense, dark gray, coarse to fine SAND, little gravel and silt (FILL)	PID=0
			2-4	S-2	15/24	22-23-19-16 (N=42)	SM		Dry, very dense, light brown, medium to fine SAND, little silt, trace gravel (FILL)	PID=0
22		5	4-6	S-3	6/24	15-8-5-4 (N=13)	GP		Moist, medium dense, gray, coarse GRAVEL (FILL)	
			6-8	S-4	10/24	7-10-12-5 (N=22)	SM		Moist, medium dense, dark gray, coarse to fine SAND and GRAVEL, little silt (FILL)	PID=0
			8-10	S-5	0/24	7-6-6-6 (N=12)			No recovery. Gravel stuck in tip of sampler. (FILL)	PID=0
17		10	10-12	S-6	11/24	5-6-6-7 (N=12)	ML		Moist, stiff, light brown SILT, trace gravel (FILL)	PID=0
	▽									
12		15	14-16	S-7	9/24	5-7-5-3 (N=12)	GW		Wet, medium dense, gray, coarse to fine GRAVEL, little sand, trace fines. Fragments of brick. (FILL)	PID=0 Cobble from 16-17.5 ft
7									Wet, dense, brownish-gray, coarse GRAVEL and sand, little silt (GLACIAL TILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-5

Date(s) Drilled	08/27/2019 - 08/27/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	26.8 ft / NGVD 1929		
Location	Intersection of Taft St. and Jenks Way	Coordinates	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	▽		19-21	S-8	10/24	10-21-19-29 (N=40)	GM		Wet, dense, brownish-gray, coarse GRAVEL, little sand and silt (GLACIAL TILL)	PID=0
-2		25	24-26	S-9	12/24	13-16-19-29 (N=35)	SM		Wet, dense, brownish-gray, SAND, some gravel, little silt (GLACIAL TILL)	PID=0
-3		30							Top of Bedrock at 27.0 ft. See Core Boring Report for rock details.	
-8		35								
-13										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-5

Date(s) Drilled:	08/27/2019 - 08/27/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	35.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	26.8 ft / NGVD 1929		
Location:	Intersection of Taft St. and Jenks Way	Coordinates:	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
2	25								See Test Boring Report for Overburden Details							
		27-32	2 2 2	1	C-1	58/ 97%	47/ 78%		Strong, fresh, gray, medium-grained SANDSTONE	28.9	J	40	SR	5.00	FR	
-3																

McMILLEN JACOBS ASSOCIATES

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-5

Date(s) Drilled:	08/27/2019 - 08/27/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	35.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	26.8 ft / NGVD 1929		
Location:	Intersection of Taft St. and Jenks Way	Coordinates:	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		27-32	4 5	1	C-1	58/ 97%	47/ 78%		Strong, fresh, gray, medium-grained SANDSTONE	30.5 30.6	J J	40 40	SR SR	5.00 5.00	FR FR	
-8	35	32-35	3 3	1	C-2	32/ 90%	24/ 67%		Strong, fresh, gray, fine-grained SILTSTONE	32.6 33.7	J J	40 30	SR R	1.00 5.00	FR FR	
-13									Bottom of borehole at 35.0 ft.							

McMILLEN JACOBS ASSOCIATES

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-6

Date(s) Drilled	08/29/2019 - 08/29/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	4.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum			
Location	On Roosevelt Ave Ext. north of Jenks Way	Coordinates		Elevation Source	Google Earth		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	10/18	9-9-11 (N=20)	SW		Moist, medium dense, brown, coarse to fine SAND with gravel, trace silt (FILL)	
			2-4	S-2	15/24	5-5-6-39 (N=11)	SP		Moist, medium dense, dark brown, medium to fine SAND, little gravel, trace silt. Trace brick fragments. Possible concrete in tip. (FILL)	
-5		5							Bottom of borehole at 4.0 ft.	
									Pieces of possible concrete in tip of sampler. Relocated to new location at Boring B-6A.	
-10		10								
-15		15								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-6

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-6A

Date(s) Drilled	09/18/2019 - 09/18/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	25.4 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. north of Jenks Way	Coordinates	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
21		5								
			6-8	S-1	8/24	7-4-5-8 (N=9)	SM		Moist, loose, brown, medium to fine SAND, little silt. Black sand in tip of sampler. (FILL)	PID=0
16			8-10	S-2	8/24	10-14-20-15 (N=34)	SP-SM		Moist, dense, brown to black, medium to fine SAND, trace silt (FILL)	PID=0
	▽	10	10-12	S-3	10/24	7-6-4-3 (N=10)	SP-SM		Wet, medium dense, dark brown, medium to fine SAND, little gravel, trace fines (FILL)	Water loss while drilling from 10-14 ft PID=0
11		15	14-16	S-4	8/24	12-5-13-9 (N=18)	SP-SM		Wet, medium dense, gray, SAND, some coarse to fine gravel, little silt. Pieces of glass. (FILL)	PID=0
6									Wet, very dense, gray, SAND and gravel, little silt (GLACIAL TILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-6A

Date(s) Drilled	09/18/2019 - 09/18/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	25.4 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. north of Jenks Way	Coordinates	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
			19-21	S-5	15/24	26-35-39-38 (N=74)	SM		Wet, very dense, gray, SAND and GRAVEL, little silt (GLACIAL TILL)	PID=0 Rig Chatter
			24-24.1	S-6	1/1	50/1"				
1		25					GW		Wet, very dense, gray, coarse to fine GRAVEL, little silt (GLACIAL TILL)	Rig Chatter
									Top of Bedrock at 26.0 ft. See Core Boring Report for rock details.	Rollerbit from 24.1 ft to 26 ft and hit refusal
-4		30								
-9		35								
-14										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-6A

Date(s) Drilled:	09/18/2019 - 09/18/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.4 ft / NGVD 1929		
Location:	On Roosevelt Ave Ext. north of Jenks Way	Coordinates:	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
1	25								See Test Boring Report for Overburden Details							
		26-31	3	3	C-1	59/ 98%	34/ 57%		Strong, fresh, gray, fine-grained SILTSTONE	26.5	J	40	R	1.00	FR	
										26.7	J	40	SR	1.00	FR	
										26.9	J	30	SR	1.00	SL	
			5							27.6	J	30	SR	1.00	FR	
										27.6	J	20	S	1.00	FR	
										27.9	J	40	S	1.00	SL	
										28.0	J	10	S	1.00	FR	
			4							28.2	J	40	SR	1.00	FR	
										28.7	J	40	S	1.00	FR	
										28.8	J	40	SR	1.00	FR	
										29.0	J	30	SR	1.00	FR	
										29.0	J	20	S	1.00	FR	
-4			6							29.2	J	20	SR	5.00	FR	

McMILLEN JACOBS ASSOCIATES

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-6A

Date(s) Drilled:	09/18/2019 - 09/18/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.4 ft / NGVD 1929		
Location:	On Roosevelt Ave Ext. north of Jenks Way	Coordinates:	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		26-31	5	3	C-1	59/ 98%	34/ 57%		Strong, fresh, gray, fine-grained SILTSTONE	30.1	J	50	SR	5.00	FR	
										30.2	J	30	S	1.00	FR	
										30.6	J	30	SR	1.00	FR	
										30.7	J	40	SR	5.00	FR	
									Bottom of borehole at 31.0 ft.							
-9																
	35															
-14																

McMILLEN JACOBS ASSOCIATES

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-7

Date(s) Drilled	08/30/2019 - 08/30/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	29.2 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	23.3 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. across from National Grid Property	Coordinates	359529.70E,288817.39N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	11/18	5-11-17 (N=28)	SP-SM		Moist, medium dense, light brown/red, coarse to fine SAND, some gravel, trace silt (FILL)	PID=0
			2-4	S-2	16/24	11-11-7-6 (N=18)	SP-SM		Moist, medium dense, black, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
19	▽	5	4-6	S-3	4/24	4-2-3-2 (N=5)	SP-SM		Wet, loose, black, medium to fine SAND, little gravel, trace silt (FILL)	
			6-8	S-4	6/24	1-2-1-0 (N=3)	GW		Wet, very loose, black, coarse to fine GRAVEL, little sand (FILL)	PID=0
14			8-10	S-5	8/24	1-1-18-6 (N=19)	GW-GM		Wet, medium dense, black, coarse to fine GRAVEL, trace sand and silt (FILL)	PID=0
		10	10-12	S-6	15/24	10-47-34-18 (N=81)	GW		Wet, very dense, dark brown decomposed wood. Bottom 3": Gray coarse to fine GRAVEL, some silt, little sand (FILL)	3 in split spoon sample. PID=0
9		15	14-16	S-7	13/24	8-9-24-36 (N=33)	SM		Wet, dense, light brown, medium to fine SAND, some gravel, little silt (GLACIOFLUVIAL)	PID=0 Rig Chatter
4			19-20.8	S-8	15/22	21-35-52-50/4" (N=87)			Wet, very dense, light brown, medium to fine SAND, little gravel, trace silt (GLACIOFLUVIAL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-7

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-7

Date(s) Drilled	08/30/2019 - 08/30/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	29.2 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	23.3 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. across from National Grid Property	Coordinates	359529.70E,288817.39N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
							SP		Wet, very dense, light brown, medium to fine SAND, little gravel, trace silt (GLACIOFLUVIAL)	PID=0
			24-24.08	S-9	1/1	80/1"				
-1		25					SC		Wet, very dense, gray, fine SAND and clay, some fractured rock (GLACIAL TILL)	Rig Chatter
			29-29.13	S-10	0/2	50/2"				
-6		30							Bottom of borehole at 29.2 ft.	
-11		35								
-16										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-7

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-8

Date(s) Drilled	09/10/2019 - 09/10/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	25.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	31.1 ft / NGVD 1929		
Location	Intersection of Roosevelt Ave. Ext. and Main St.	Coordinates	359697.13E,289110.39N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
27		5								
			6-8	S-1	6/24	14-8-5-8 (N=13)	SM		Moist, stiff, brown, SAND, some silt, little gravel (FILL)	PID=0
22			8-10	S-2	9/24	7-4-4-5 (N=8)	SP		Wet, loose, brown, coarse to fine SAND, little gravel, trace silt (GLACIOFLUVIAL)	PID=0
	▽	10	10-12	S-3	7/24	6-5-2-1 (N=7)	SM		Wet, loose, brown, SAND, some silt, little gravel (GLACIOFLUVIAL)	PID=0
17			~~14-14.08~~	~~S-4~~	~~1/1~~	~~50/1"~~				No casing advancement
		15					GW		Wet, very dense, gray, coarse to fine GRAVEL, trace silt (GLACIAL TILL)	
										Sampler refusal at 14.1 ft. Rollerbit from 14.1 ft to 16 ft.
12									See Core Boring Report for rock details	

▽ - Water Level at Time of Drilling

McMILLEN JACOBS ASSOCIATES

Boring B-8

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-8

Date(s) Drilled:	09/10/2019 - 09/10/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	25.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	31.1 ft / NGVD 1929		
Location:	Intersection of Roosevelt Ave. Ext. and Main St.	Coordinates:	359697.13E,289110.39N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
17	15								See Test Boring Report for Overburden Details
12		16-21	3	3	C-1	58/ 97%	16/ 27%		Strong, fresh, gray, medium-grained SANDSTONE
			3						
			2						
			2						

DISCONTINUITIES

DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
16.3	J	30	SR	5.00	FR	
16.4	J	30	SR	10.0	FR	
16.5	J	30	S	0	FR	
16.8	J	40	R	1.00	FR	
16.8	J	20	SR	10.0	FR	
16.9	J	50	SR	0	FR	
17.2	J	30	SR	10.0	FR	FE
17.3	J	30	SR	0	FR	FE
17.6	J	40	SR	5.00	FR	FE
17.7	J	40	R	5.00	FR	FE
17.8	J	40	SR	5.00	FR	
17.9	J	40	SR	10.0	FR	
18.0	J	50	R	0	FR	FE
18.7	J	50	SR	10.0	FR	FE
19.0	J	40	SR	0	FR	
19.2	J	30	SR	5.00	FR	
19.3	J	40	SR	5.00	FR	
19.4	J	50	SR		FR	
19.5						

McMILLEN JACOBS ASSOCIATES

Boring B-8

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-8

Date(s) Drilled:	09/10/2019 - 09/10/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	25.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	31.1 ft / NGVD 1929		
Location:	Intersection of Roosevelt Ave. Ext. and Main St.	Coordinates:	359697.13E,289110.39N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
		16-21	2	3	C-1	58/ 97%	16/ 27%		Strong, fresh, gray, medium-grained SANDSTONE
		21-25	3	3	C-2	42/ 88%	11/ 23%		Strong, fresh, gray, medium-grained SANDSTONE with conglomeratic material between 21-22.2 ft
			2						
			8						
7			1						
	25								Bottom of borehole at 25.0 ft.
2									

DISCONTINUITIES

DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
19.8	J	20	SR	10.0	FR	
20.0	J	30	SR	0	FR	
	J	30	SR	5.00	FR	
20.6	J	10	SR	5.00	FR	
20.7	J	30	SR	1.00	FR	
21.1	J	10	SR	5.00	FR	
21.2	J	50	SR	10.0	FR	
21.5	J	40	SR	0	FR	
21.6	J	40	SR	10.0	FR	
21.7	J	50	S	0	FR	
21.9	J	40	SR	10.0	FR	
22.2	J	40	SR	0	FR	
				5.00		
				5.00		
				5.00		
				5.00		
				5.00		
				5.00		
23.7	J	30	R	5.00	SL	
				1.00		
24.0	J	30	SR	5.00	FR	
				1.00		
				5.00		
				1.00		

McMILLEN JACOBS ASSOCIATES

Boring B-8

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-9

Date(s) Drilled	02/10/2020 - 02/10/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	39.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	28.0 ft / NGVD 1929		
Location	Across Taft St. from charter school on Tidewater Site	Coordinates	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
24		5								
			6-8	S-1	6/24	7-16-19-19 (N=35)	SP		Moist, dense, brown, fine SAND little gravel, trace silt (FILL)	PID=0
			8-10	S-2	20/24	13-16-13-9 (N=29)	SP		Top 7": Moist, brown, SAND, some gravel (FILL)	PID=0
19		10					ML		Bottom 13": Moist, very stiff, light brown, SILT, trace sand (ALLUVIUM)	
14		15	14-16	S-3	6/24	15-11-5-5 (N=16)	ML		Moist, very stiff, brown, SILT, trace sand (ALLUVIUM)	PID=0
	▽		17-19	S-4	20/24	6-3-2-3 (N=5)	ML		Wet, medium stiff, dark gray, clayey SILT (ALLUVIUM)	PID=0
9									Wet, medium stiff, dark gray, clayey SILT (ALLUVIUM)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-9

Date(s) Drilled	02/10/2020 - 02/10/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	39.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	28.0 ft / NGVD 1929		
Location	Across Taft St. from charter school on Tidewater Site	Coordinates	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	19-21	S-5	19/24	5-1-6-23 (N=7)	ML		Wet, medium stiff, dark gray, clayey SILT (ALLUVIUM)	PID=0
	21-23	S-6	16/24	19-28-19-26 (N=47)	SW		Moist, dense, orange brown, coarse to medium SAND, little gravel (GLACIAL TILL)	PID=0
-4	23-25	S-7	16/24	42-38-50- 58 (N=88)	GM		Moist, very dense, gray, coarse to fine GRAVEL, some clayey silt, little sand (GLACIAL TILL)	PID=0
25	25-27	S-8	16/24	62-44-37-52 (N=81)	SM		Moist, very dense, gray, medium to fine SAND and coarse to fine GRAVEL, little silt (GLACIAL TILL)	PID=0
	27-28.75	S-9	17/21	38-30-32-100/3" (N=62)	SM		Moist, very dense, gray, medium to fine SAND and coarse to fine GRAVEL, little clayey silt (GLACIAL TILL)	PID=0. Rock fragments in tip of sampler.
-1								
30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-6								
35								
-11								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-9

Date(s) Drilled:	02/10/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	28.0 ft / NGVD 1929		
Location:	Across Taft St. from charter school on Tidewater Site	Coordinates:	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
4																
	25															
									See Test Boring Report for Overburden Details							
-1		29-34	6	5	C-1	58/ 97%	41/ 68%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-9

Date(s) Drilled:	02/10/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	28.0 ft / NGVD 1929		
Location:	Across Taft St. from charter school on Tidewater Site	Coordinates:	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
		29-34	4, 3, 2, 2	5	C-1	58/ 97%	41/ 68%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE
-6	35	34-39	3, 2, 2, 2, 4	5	C-2	60/ 100%	39/ 65%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE
-11									Bottom of borehole at 39.0 ft.

DISCONTINUITIES

DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
30.9	HJ	30				
31.4	J	35	SR	0.50	SW	SL
31.8	J	30	SM	0.50	SW	
32.0	HJ	40				
32.3	J	40	SM	1.00	SW	SL
32.3	J	30	SM	0.50	SW	SL
32.5	J	30	SM	0.50	SW	
32.7	J	30	SM	0.50	SW	
32.8	J	30	SM	0.50	SW	SL
32.9	J	30		0.50	SW	
33.2	J	30	SR	0.50	SW	
33.3	HJ	30	SM	0.50	SW	
33.6	J	30				
33.7	HJ	30				
33.8	J	25				
34.1	HJ	40	SM	0.50	SW	SL
34.3	HJ	70				
34.5	J	35				
34.6	HJ	20	SR	0.50	SW	
34.8	HJ	45				
35.1	J	50				
36.0	J	40	SR	0.50	SW	SL
36.8	J	45	SR	0.50	SW	SL
37.0	J	40	SR	0.50	SW	
37.2	J	35	SL	0.50	SW	
37.7	J	65	SL	0.50	SW	
37.8	J	35	SL	0.50	SW	CS
38.0	F/S	40	SL	5.00	MW	
38.4	J	40	SM	0.50	SW	SL
38.5	J	40	SM	0.50	SW	SL
38.6	J	40	SM	0.50	SW	SL
38.7	J	40	SM	0.50	SW	SL
38.8	J	35	SR	0.50	SW	

McMILLEN JACOBS ASSOCIATES

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-10

Date(s) Drilled	02/05/2020 - 02/05/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	23.7 ft / NGVD 1929		
Location	Southerly end of field on Tidewater Site	Coordinates	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
19		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	11/24	17-16-18-20 (N=34)	SP		Moist, dense, brown, medium SAND, trace gravel (FILL)	PID=0
			8-10	S-2	21/24	17-15-17-17 (N=32)	SP		Moist, dense, brown, medium SAND (FILL)	PID=0
14		10	10-12	S-3	9/24	15-10-12-16 (N=22)	SP		Moist, medium dense, dark brown, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
			12-14	S-4	20/24	14-12-19-18 (N=31)	SP		Moist, dense, dark brown, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
9		15	14-16	S-5	9/24	19-13-14-10 (N=27)	SP		Moist, medium dense, dark brown, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
			16-18	S-6	4/24	11-10-12-11 (N=22)	SP		Moist, medium dense, dark brown, medium SAND, trace gravel and silt. Fragments of brick. (FILL)	PID=0. Rock fragments in tip of sampler.
4			18-20	S-7	12/24	19-23-30-46 (N=53)	SP		Moist, very dense, brown, coarse to fine SAND, some gravel, trace silt (FILL)	PID=0

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-10

Date(s) Drilled: 02/05/2020 - 02/05/2020	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: M. MacInnis	Checked By: J. Freitas
Drilling Method/ Rig Type: Mud Rotary/Acker Scout	Drilling Contractor: Geologic Earth Exploration, Inc.	Total Depth of Borehole: 31.0 ft	
Borehole Diameter/ Sampler Diameter: 4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum: 23.7 ft / NGVD 1929	
Location: Southerly end of field on Tidewater Site	Coordinates: 359996.52E,286103.11N	Elevation Source: Field Survey	

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	▽		20-21	S-8	9/12	73-103 (Refusal)	GM		Wet, very dense, dark gray, coarse to fine GRAVEL, little sand and silt (GLACIAL TILL)	PID=3. Petroleum odor, oily appearance, rock fragments in tip of sampler.
									Top of Bedrock at 21.0 ft. See Core Boring Report for rock details.	
-1		25								
-6		30								
-11		35								
-16										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-10

Date(s) Drilled:	02/05/2020 - 02/05/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	23.7 ft / NGVD 1929		
Location:	Southerly end of field on Tidewater Site	Coordinates:	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
									See Test Boring Report for Overburden Details
		21-26	3	4	C-1	56/ 93%	37/ 62%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE
			3						
			4						
			5						
-1	25		10						
		26-31	2	4	C-2	60/ 100%	52/ 87%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE
			3						
			3						
			2						
-6									

DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
21.3	J	65	SM	1.00	FR	
21.7	J	30	R	1.00	SW	SI
22.2	J	25	R		SW	
22.8	J	45	SM		SW	
23.2	J	60	VR	1.00	SW	PY
23.4	J	35	R	0.50	SW	
23.7	J	35	R	0.25	SW	
23.9	J	40	R	2.00	SW	
24.4	J	40	R	1.00	SW	
24.7	J	40	R	0.50	SW	
24.9	J	45	R	2.00	SW	
25.2	J	20	VR	2.00	SW	
25.4	J	35	R		SW	
27.2	J	50	SR	1.00	SW	CA
27.6	HJ	70	SR	2.00	SW	
27.7	J	40			SW	
28.9	J	45	SR	1.00	SW	SI
29.0	J	50	SR	0.25	SW	
29.1	J	40	SM	1.00	SW	
29.4	J	45	SM	1.00	SW	
29.8	J	35	SM	1.00	SW	

McMILLEN JACOBS ASSOCIATES

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-10

Date(s) Drilled:	02/05/2020 - 02/05/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	23.7 ft / NGVD 1929		
Location:	Southerly end of field on Tidewater Site	Coordinates:	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		26-31	3	4	C-2	60/ 100%	52/ 87%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE	30.0	J	35	SM	0.50	SW	
										30.5	J	25	SM	0.25	SW	
										30.7	J	40	SM	0.25	SW	
									Bottom of borehole at 31.0 ft.							
-11	35															
-16																

McMILLEN JACOBS ASSOCIATES

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-11

Date(s) Drilled: 02/07/2020 - 02/10/2020	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: M. MacInnis	Checked By: J. Freitas
Drilling Method/ Rig Type: Mud Rotary/Acker Scout	Drilling Contractor: Geologic Earth Exploration, Inc.	Total Depth of Borehole: 39.0 ft	
Borehole Diameter/ Sampler Diameter: 4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum: 25.7 ft / NGVD 1929	
Location: Tidewater Site	Coordinates: 359825.47E,286216.96N	Elevation Source: Field Survey	

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 1 ft: Encountered existing concrete tank foundation (1ft thick from 1-2ft below grade) (FILL)	
			2-4	S-1	24/24	20-23-42-21 (N=65)	SW		Moist, very dense, brown, medium to fine SAND, some gravel (FILL)	PID=0
21		5	4-6	S-2	12/24	20-22-56-36 (N=78)	SW		Moist, very dense, brown, medium to coarse SAND and gravel, trace silt (FILL)	Rig Chatter. PID=0
16		10	9-11	S-3	14/24	14-9-13-10 (N=22)	ML		Moist, very stiff, light brown SILT, trace fine sand, trace clay (ALLUVIUM)	PID=0
			13-15	S-4	17/24	7-3-8-8 (N=11)	ML		Moist, stiff, light brown, clayey SILT, trace sand (ALLUVIUM)	PID=0
11		15	15-17	S-5	7/24	19-22-16-16 (N=38)	GM		Moist, dense, brown, coarse to fine GRAVEL, some coarse to fine sand, little silt (GLACIOFLUVIAL)	PID=0
	▽		17-19	S-6	12/24	15-10-10-12 (N=20)	GM		Moist, medium dense, brown, coarse to fine GRAVEL, some sand, little silt (GLACIOFLUVIAL)	PID=0
6										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-11

Date(s) Drilled	02/07/2020 - 02/10/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	39.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	25.7 ft / NGVD 1929		
Location	Tidewater Site	Coordinates	359825.47E,286216.96N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	19-21	S-7	10/24	14-15-9-10 (N=24)	SP-SM		Moist, medium dense, light brown, coarse to medium SAND, some gravel, trace silt (GLACIOFLUVIAL)	Rig Chatter. PID=0
	21-23	S-8	16/24	9-6-14-20 (N=20)	ML		Moist, very stiff, dark gray, clayey SILT, some sand (GLACIOFLUVIAL)	PID=0. Rock fragments in tip of sampler
	23-25	S-9	8/24	24-22-26-24 (N=48)	GM		Moist, dense, gray, coarse to fine GRAVEL, some sand, little clayey silt (GLACIAL TILL)	PID=0
-1 25	25-27	S-10	15/24	26-48-18-52 (N=66)	GM		Moist, very dense, gray, coarse to fine GRAVEL, some sand, little clayey silt (GLACIAL TILL)	PID=0. Rock fragments in tip of sampler
-4 30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-9 35								
-14							Bottom of borehole at 39.0 ft.	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-11

Date(s) Drilled:	02/07/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.7 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359825.47E,286216.96N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
1	25								See Test Boring Report for Overburden Details							
-4		29-33	2	4	C-1	25/ 52%	5/ 10%		Strong, moderately to completely weathered, dark gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-11

Date(s) Drilled:	02/07/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.7 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359825.47E,286216.96N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		29-33	1	4	C-1	25/ 52%	5/ 10%		Strong, moderately to completely weathered, dark gray, medium-grained SANDSTONE	30.5	J	45	R		MW	FE
										30.8	J	30	R		MW	FE
										31.0	J	15	R	1.00	SW	
										31.2	J	50	VR		MW	FE
										31.5	J	40	SR		MW	FE
			2													
									Split spoon sample attempted at 34 ft. with blow count of 50/0"							
-9	35	34-39	3	4	C-2	52/ 87%	41/ 68%		Strong, slightly weathered, gray, medium-grained SANDSTONE	34.1	J	45	SR	1.00	SW	SI
										34.9	J	45	SM	1.00	SW	
			3							35.2	J	45	SR	2.00	SW	SI
										35.4	J	35	VR	2.00	SW	SI
										35.5	J	40	SR	0.50	SW	SI
										35.7	J	50	VR	0.50	SW	SI
			4							36.2	J	45	SR	1.00	SW	
										37.0	J	40	SR	1.00	SW	
			4							37.3	J	50	VR	1.00	SW	
										37.7	J	55	SR	0.50	SW	
										38.0	J	40	SR	0.50	SW	
			4													
-14									Bottom of borehole at 39.0 ft.							

McMILLEN JACOBS ASSOCIATES

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-12

Date(s) Drilled	02/11/2020 - 02/12/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	51.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	30.1 ft / NGVD 1929		
Location	Across Taft St. from Tower St. on Tidewater Site	Coordinates	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
26		5								
			6-8	S-1	14/24	12-17-14-18 (N=31)	ML		Moist, hard, light brown SILT, little clay (ALLUVIUM)	PID=0
21			8-10	S-2	19/24	13-8-12-14 (N=20)				PID=0
		10					ML		Moist, very stiff, dark gray, clayey SILT (ALLUVIUM)	
16										
		15	14-16	S-3	11/24	4-8-7-7 (N=15)				PID=0
							ML		Moist, stiff, dark gray, clayey SILT (ALLUVIUM)	
11							ML		Moist, gray SILT (ALLUVIUM)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-12

Date(s) Drilled	02/11/2020 - 02/12/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	51.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	30.1 ft / NGVD 1929		
Location	Across Taft St. from Tower St. on Tidewater Site	Coordinates	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	▽		19-21	S-4	16/24	9-15-18-21 (N=33)	SP		Moist, dense, brown, fine to medium SAND, trace silt (ALLUVIUM)	PID=0
6			23-25	S-5	12/24	24-14-16-20 (N=30)	CL		Moist, hard, light brown CLAY, little silt (GLACIAL TILL)	PID=0
		25	25-27	S-6	16/24	34-64-65-54 (N=129)	GC		Moist, very dense, brown, clayey GRAVEL, little sand and silt (GLACIAL TILL)	Sampler would not open. PID=0.
			27-28.75	S-7	4/21	34-69-48-100/3" (N=117)	GC		Moist, very dense, brown, clayey GRAVEL, little sand (GLACIAL TILL)	PID=0. Rock fragments lodged in tip of sampler.
1		30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-4		35								
-9										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
6																
	25															
									See Test Boring Report for Overburden Details							
1		29-34	3		C-1	9/ 15%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		29-34	3, 4, 1, 1		C-1	9/ 15%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							
-4	35	34-37	2, 1, 6		C-2	13/ 36%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							
-9		37-41	4		C-3	6/ 12%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		37-41			C-3	6/ 12%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							
		41-46	2	5	C-4	59/ 98%	53/ 88%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE	41.4	J	35	SR	0.50	SW	SI
										42.0	J	30	SM	0.50	SW	
			3							42.8	J	30	SM	0.50	SW	
			2							43.6	J	20	SR	2.00	SW	SI
-14										44.2	F/S	30	SL	5.00	MW	CS
			2													
	45									45.0	J	25	SM	0.50	SW	
			2							45.4	J	35	SM	0.50	SW	
										45.5	J			0.50	SW	
		46-51	2	5	C-5	59/ 98%	46/ 77%		Strong, slightly weathered, purple, medium-grained SANDSTONE	46.1	J	35	SL	0.50	SW	PY
										46.2	J	30	SL	0.50	SW	
										46.4	J	25	SR	0.50	SW	
			2							47.2	J	40	SR	0.50	SW	
										47.3	J	40	SM	0.50	SW	
										47.7	J	40	SM	0.50	SW	SL
			2													
-19																
			2							49.4	HJ	20	SM	0.50	SW	
										49.4	J	30	SR	0.50	SW	
										49.6	J	40		0.50		

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		46-51	2	5	C-5	59/ 98%	46/ 77%		Strong, slightly weathered, purple, medium-grained SANDSTONE	50.2 50.2 50.6	HJ J J	35 35 35	SM SR	0.50 0.50 0.50	SW SW	SL
									Bottom of borehole at 51.0 ft.							
-24																
	55															
-29																

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-13

Date(s) Drilled	02/06/2020 - 02/06/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	21.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	9.7 ft / NGVD 1929		
Location	Across Seekonk River from Festival Pier on Tidewater Site	Coordinates	360398.12E,286078.13N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
5		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	3/24	75-86-54-12 (N=140)	GW		Moist, very dense, dark gray, coarse to fine GRAVEL, some sand, trace silt (FILL)	PID=0
0		10	8-10	S-2	20/24	2-5-6-2 (N=11)	SM		Moist, medium dense, dark gray, medium to fine SAND, little silt grading to coarse to fine GRAVEL, little silt. Fragments of brick. (FILL)	PID=0. Strong petroleum odor, oily sheen.
			10-12	S-4	1/24	7-4-5-6 (N=9)	GM		Moist, medium dense, dark gray, sandy GRAVEL, little silt (FILL)	PID=2
										Rig Chatter
-5	▽	15	14-16	S-5	13/24	30-16-17-26 (N=33)	GW		Wet, dense, dark gray, coarse to fine sandy GRAVEL, trace silt (FILL)	PID=0. Rock fragments in tip of sampler, strong petroleum odor.
-10									Wet, hard, grey/brown clayey SILT, trace fine sand (FILL)	PID>100. Very strong petroleum odor, oily sheen.

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-13

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-13

Date(s) Drilled	02/06/2020 - 02/06/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	21.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	9.7 ft / NGVD 1929		
Location	Across Seekonk River from Festival Pier on Tidewater Site	Coordinates	360398.12E,286078.13N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
			19-21	S-6	11/24	19-19-23-18 (N=42)	ML		Wet, hard, grey/brown clayey SILT, trace fine sand (FILL)	
									Bottom of borehole at 21.0 ft.	
-15		25								
-20		30								
-25		35								
-30										

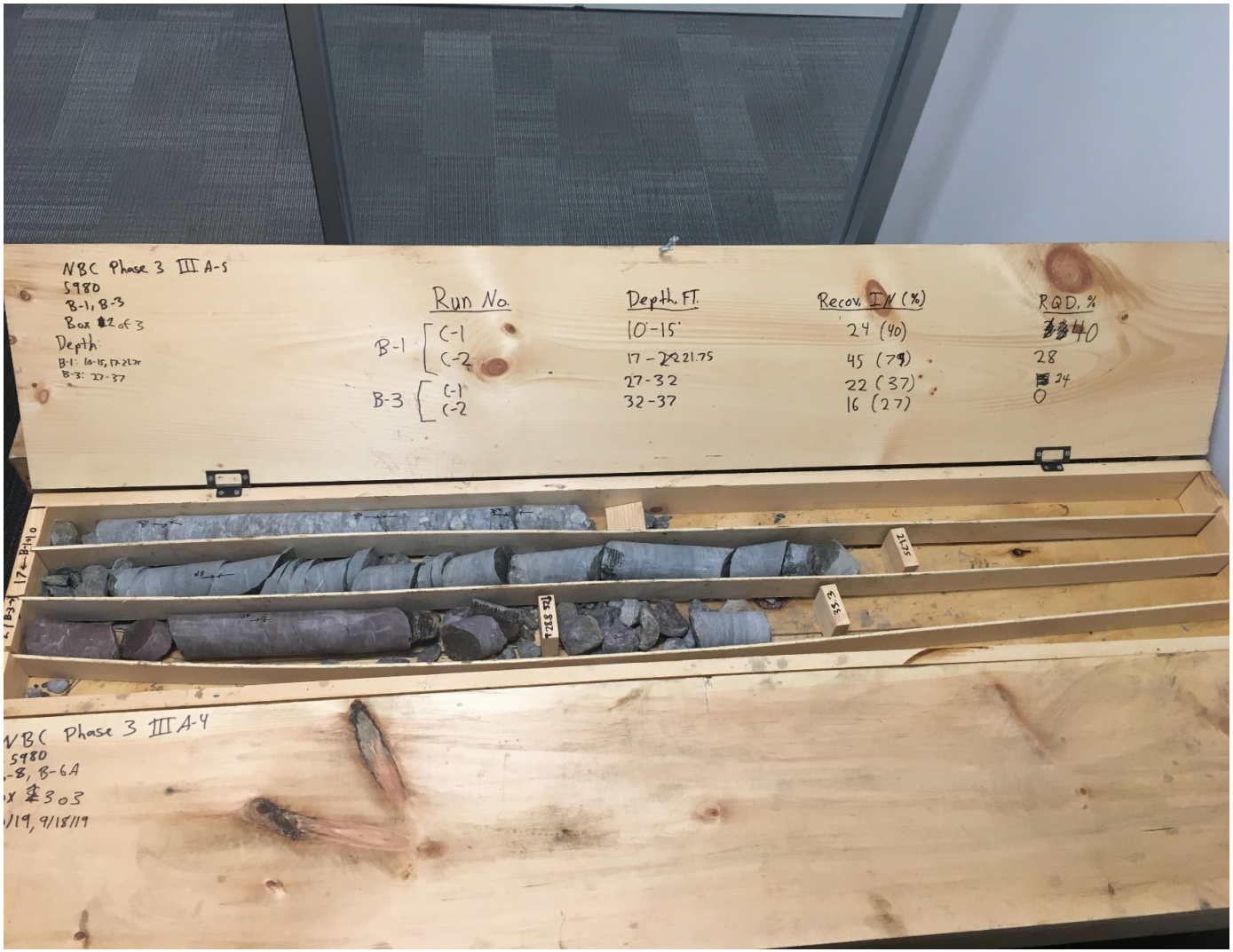
McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-13

APPENDIX B
Rock Core Photographs

CORE PHOTOS



McMILLEN JACOBS ASSOCIATES	**Test Boring B-1, Run C-1 & C-2 (10 ft to 21.75 ft)** **Test Boring B-3, Run C-1 & C-2 (27 ft to 37 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	11/20/2019	**Figure**	B.1

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	**Test Boring B-8, Run C-1 & C-2 (16 ft to 25 ft)** **Test Boring B-6A, Run C-1 (26 ft to 31 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	11/20/2019	**Figure**	B.2

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	**Test Boring B-5, Run C-1 & C-2 (27 ft to 35 ft)** **Test Boring B-4C, Run C-1 (30 ft to 35 ft)** **Test Boring B-2, Run C1 (29 ft to 34 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	11/20/2019	**Figure**	B.3

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	**Test Boring B-10, Run C-1 & C-2 (21 ft to 31 ft)** **Test Boring B-11, Run C-1 & C-2 (29 ft to 39 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	2/25/2020	**Figure**	B.4

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	**Test Boring B-9, Run C-1 & C-2 (29 ft to 39 ft)** **Test Boring B-12, Run C-4 & C-5 (41 ft to 51 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	2/25/2020	**Figure**	B.5

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	Test Boring B-12, C-1 (29 ft to 34 ft)	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	2/12/2020	**Figure**	B.6

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	**Test Boring B-12, C-2 (34 ft to 37 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	2/12/2020	**Figure**	B.7

CORE PHOTOS

McMILLEN JACOBS ASSOCIATES	**Test Boring B-12, C-3 (37 ft to 41 ft)**	**Project**	NBC Phase 3 IIIA-4 and IIIA-5 Consolidation Conduits		
		Date	2/12/2020	**Figure**	B.8

APPENDIX C
Groundwater Observation Well Installation and Monitoring Reports

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-2

Boring No. B-2

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/4/2019-9/5/2019
DRILLER	Paul Fisher	**WATER LEVEL**	8.60

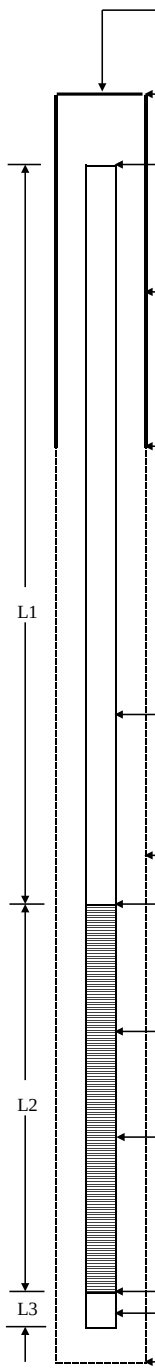
Ground El. 22.22 ft
El. Datum NVGD 29

Location Middle of the field on Tidewater Site

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-14': Fill - Brown and gray, sands, silts, and gravel	0-2': Grout
	2-3': Bentonite Seal
14-20': Alluvium - Brown silty sands and silt	3-15': Holliston Sand
24-29': Till - Sands, silts and gravels.	15-34': Grout
29-34': Rock	

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.5	ft
Height of top of riser pipe above the ground surface	2	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Grout	0.0	2.0
Bentonite	2.0	1.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	5.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	15.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	34.0	ft

ft	+	ft	+	ft	=	ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	Boring No.
B-02	B-02

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/4/2019-9/5/2019

ELEVATION OF REFERENCE POINT 22.2 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
9/9/2019	7:00am	4	11.1	11.1		SW
2/4/2020	12:00pm	152	5	17.2		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-3

Boring No. B-3

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/9/2019
DRILLER	Ray Eastwood	**WATER LEVEL**	

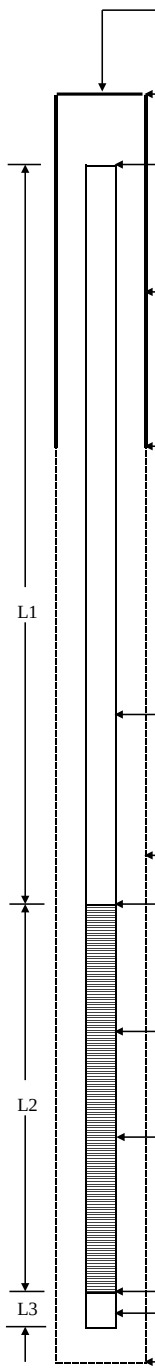
Ground El. 37.45 ft
El. Datum NVGD 29

Location Northwestern corner of the Tideawter Site

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-14': Fill - Brown, silty sands with gravel	
14-23': Tan, sands with silt and gravel	0-12.5': Grout and Drill Cuttings
	12.5-14.5': Bentonite Seal
23-27': Till - Brown, sands, silts, clays and gravel	
27-37': Rock	14.5-26.5': Holliston Sand
	26.5-37': Bentonite Chips

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.5	ft
Height of top of riser pipe above the ground surface	2	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Grout	0.0	12.5
Bentonite	12.5	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	16.5	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	26.5	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	37.0	ft

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft	+	ft	+	ft	=	ft

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	Boring No.
B-03	B-03

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/9/2019

ELEVATION OF REFERENCE POINT 37.45 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
-	-	-	-	-	No groundwater monitoring to date due to access constraints at the Tidewater site.	-
-	-	-	-	-		-
-	-	-	-	-		-
-	-	-	-	-		-

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-4C

Boring No. B-4C

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/29/2019
DRILLER	Paul Fisher	**WATER LEVEL**	18.50

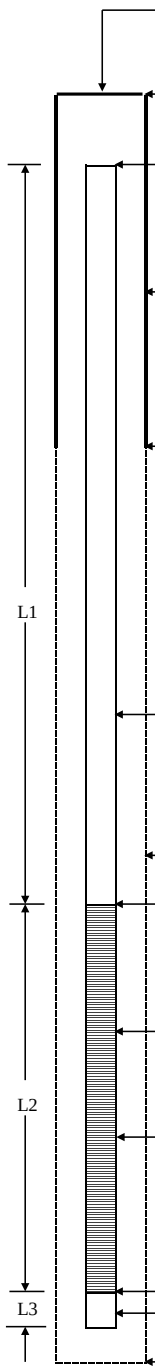
Ground El. 19.87 ft
El. Datum NVGD 29

Location East side of Roosevelt, across from southern property extents of Masonic Temple

☐ **Guard Pipe**
☑ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-20': Fill - Light brown, sands with silt and gravel	0-10': Drill Cuttings
20-24': Glaciofluvial - Red silty sand	10-12': Bentonite Seal
24-29.5': Till - Gray, sands, silts and gravels	14-24': Holliston Sand
29.5 -34': Rock	24-34': Drill Cuttings

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Roadway Box Cover	
Depth of roadway box below the ground surface	0.0	ft
Depth of top of riser pipe below the ground surface	0.5	ft
Type of protective casing:	Roadway Box	
Length	0.5	ft
Inside Diameter	6	in
Depth of bottom of guard pipe/roadway box	0.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Drill Cuttings	0.0	10.0
Bentonite	10.0	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	14.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	24.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	35.0	ft

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft		ft		ft		ft

COMMENTS:

GROUNDWATER MONITORING REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-4C

Boring No. B-4C

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/29/2019

ELEVATION OF REFERENCE POINT 19.87 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
9/12/2019	7:10am	14	18.3	1.57		SW
9/18/2019	7:10am	20	18.5	1.37		SW
2/12/2020	3:00pm	167	18.5	1.37		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-7

Boring No. B-7

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/30/2019
DRILLER	Paul Fisher	**WATER LEVEL**	8.40

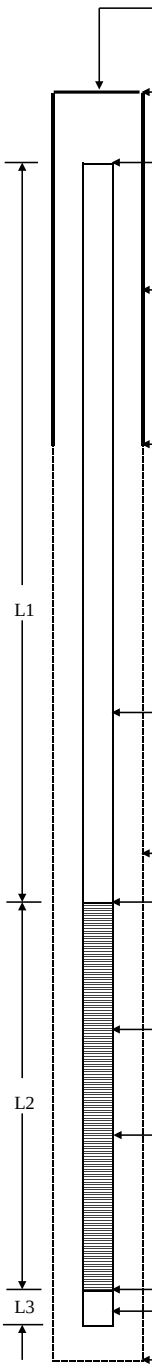
Ground El. 23.28 ft
El. Datum NVGD 29

Location West side Roosevelt Ave, across from National Grid Hydroelectric facility.

☐ **Guard Pipe**
☑ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-14': Fill - brown and black, sand with silt; and gravel with silt	0-6': Drill Cuttings
	6-8': Bentonite Seal
14-24': Glaciofluvial - Brown, silty sand with gravel	8-20': Holliston Sand
24-29.2': Till - Gray, sands, clays, and gravel	20-29.2': Drill Cuttings

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Roadway Box Cover	
Depth of roadway box below the ground surface	0.0	ft
Depth of top of riser pipe below the ground surface	0.3	ft
Type of protective casing:	Roadway Box	
Length	0.5	ft
Inside Diameter	6.0	in
Depth of bottom of guard pipe/roadway box	0.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Drill Cuttings	0.0	6.0
Bentonite Seal	6.0	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	10.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	20.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	29.2	ft

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft		ft		ft		ft

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No. B-07

Boring No. B-07

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/30/2019

ELEVATION OF REFERENCE POINT 23.28 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
9/12/2019	7:00am	13	8.4	14.88		SW
9/18/2019	7:00am	19	8.5	14.78		SW
2/10/2020	7:00am	164	8.25	15.03		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-9 (OW)
Boring No. B-9

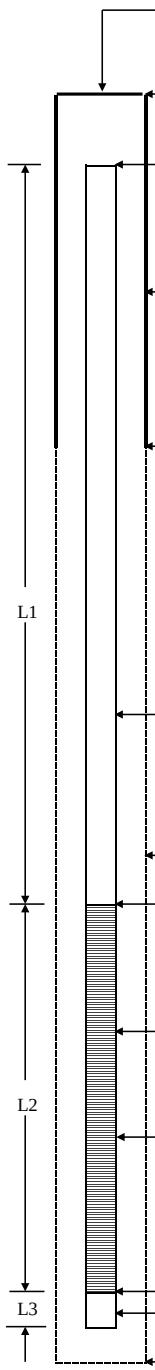
PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/10/2020
DRILLER	John Boyd	**WATER LEVEL**	10.67'

Ground El. 28.04 ft
El. Datum NVGD 29

Location Across Taft St. from charter school on Tidewater Site.

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-9': Fill - Brown sands and gravels	0-5': Drill Cuttings
	5-8': Bentonite Seal
9-20': Alluvium - Brown and gray silts and clays	8-20': Holliston Sand



Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.5	ft
Height of top of riser pipe above the ground surface	2	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	5.0	3.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holiston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	10.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holiston Sand	
Depth of bottom of well screen	20.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	20.0	ft

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)

(Not to Scale)

ft +	ft +	ft =	ft
Riser Pay Length (L1)	Length of screen (L2)	Length of silt trap (L3)	Pay length

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	B-09 (OW)
Boring No.	B-09

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/10/2020

ELEVATION OF REFERENCE POINT 28.04 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
2/10/2020	12:00pm	0	10.66	17.38		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-10 (OW)
Boring No. B-10

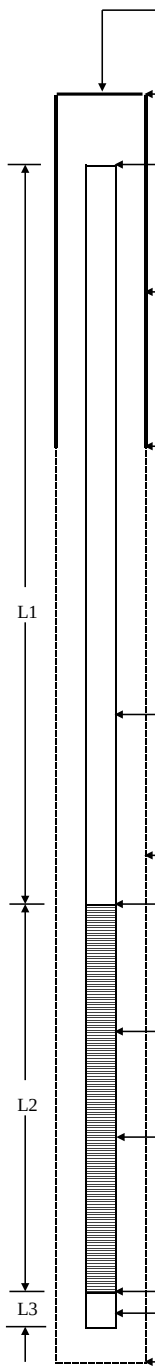
PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/6/2020
DRILLER	Dave Sheldon	**WATER LEVEL**	10.42'

Ground El. 23.74 ft
El. Datum NVGD 29

Location Southerly end of field on Tidewater Site.

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-16': Fill - Brown sand and gravels	0-2': Drill Cuttings
	2-4': Bentonite Seal
	4-16': Holliston Sand



Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.75	ft
Height of top of riser pipe above the ground surface	2.25	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.2	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite Seal	2.0	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holiston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	6.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	16.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	16.0	ft

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)

(Not to Scale)

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft	+	ft	+	ft	=	ft

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	B-10 (OW)
Boring No.	B-10 (OW)

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/6/2020

ELEVATION OF REFERENCE POINT 23.74 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
2/10/2020	12:15pm	4	10.42	13.32		MM

APPENDIX D

Subsurface Investigations by Others

Table D.1 Summary of Existing Data by Others
NBC Phase III CSO Program - Consolidation Conduit IIIA4

Table D.2 Summary of Existing Data by Others
NBC Phase III CSO Program - Consolidation Conduit IIIA5

Table D.1

Summary of Existing Data By Others[1]
NBC Phase III CSO Program - Consolidation Conduit IIIA4

Project Reference Document	Boring ID	Northing[2]	Easting[2]	Elevation[3] Ground Surface	Total Depth of Boring (ft)	Elevation Bottom of Boring	Rock Core Data Available	Laboratory Data Available (Type)[4]	Groundwater Monitoring Well	Elevation Groundwater Monitoring Well Screen Interval
NBC CSO Phase IIIA Contract No. 308.01C Geotechnical Data Report (Dec 2019)	B17-8	288429	359393	29.9	230.0	-200.1	x	GS, UCS, BTS	x	4.4 to -5.6
	B17-39	288259	359385	24.5	233.7	-209.2	x	GS, UCS, BTS	open hole readings	-
	B17-40	289233	359693	33.3	20.6	12.7	x	GS	-	-
	B17-41	287414	359505	12.8	25.0	-12.2	x	GS	-	-
	B17-45	288494	359452	28	47.4	-19.4	x	GS, PL, UCS	-	-
	B17-46	288470	359387	31.1	17.0	14.1	-	-	-	-
	B17-46A	288473	359387	30.9	43.2	-12.3	x	GS	-	-
Taft St - Pleasant St Branch Interceptor Section B Contract 18 (1950)	220	288143	359266	38.0	25.0	13.0	-	-	-	-
	221	288458	359283	30.0	18.0	12.0	-	-	-	-
	222	288781	359323	27.0	4.0	23.0	-	-	-	-
Bridge Replacement Pawtucket Bridge No. 550 I-95 Over the Seekonk River Volume Three Bridge Plans R.I. Contract 210-CB-004 (2010)	BH-10	287938	359336	40.0	14.4	25.6	-	-	-	-
	BH-11	287772	359333	48.1	20.7	27.4	-	-	drilling readings	-
	BH-12	287941	359413	14.9	31.0	-16.1	x	-	-	-
	BH-13	287868	359413	14.1	25.5	-11.4	x	-	-	-
	BH-14	287787	359414	13.3	29.5	-16.2	x	-	no readings	8.8 to -1.2
Division Street Bridge Project Contract Three R.I. Project No. I-01-(11) (1957)	BH32/BH32A	287904	359547	-12.0	24.0	-36.0	-	-	-	-
	BH33	287850	359543	-12.0	26.5	-38.5	-	-	-	-
	BH34	287800	359557	-12.3	22.0	-34.3	-	-	-	-
	BH35	287898	359459	3.0	24.0	-21.0	-	-	-	-
	BH36	287843	359456	3.0	26.5	-23.5	-	-	-	-
	BH37	287785	359461	3.5	17.0	-13.5	-	-	-	-
	BH72	287902	359355	25.5	22.0	3.5	-	-	-	-
	BH73	287816	359360	28.5	24.5	4.0	-	-	-	-
	BH102	287935	359457	5.0	10.5	-5.5	-	-	-	-

Notes

1. Table D.1 includes a summary of data by others deemed relevant for inclusion into the NBC Phase III CSO Program, Consolidation Conduits IIIA4 and IIIA5, Geotechnical Data Report (GDR).
2. Horizontal coordinates projected to Rhode Island Mainland State Plane, North American Datum (NAD), 1983. Locations of Taft St-Pleasant St and Division St Bridge borings are estimated based on visual review of the project reference documents indicated.
3. Elevations referenced to the National Geodetic Vertical Datum (NGVD) 1929, in feet.
4. Laboratory testing acronyms include GS=Grain Size Distribution, PL=Point Load, UCS=Unconfined Compressive Strength-Rock, BTS=Splitting (Brazilian) Tensile Strength.
5. "x" indicates data available. " -" indicates no data included in project reference document.

Table D.2

Summary of Existing Data By Others[1]
NBC Phase III CSO Program - Consolidation Conduit IIIA5

Project Reference Document	Boring ID	Northing[2]	Easting[2]	Elevation[3] Ground Surface	Total Depth of Boring (ft)	Elevation Bottom of Boring	Rock Core Data Available	Laboratory Data Available (Type)[4]	Groundwater Monitoring Well	Elevation Groundwater Monitoring Well Screen Interval
NBC CSO Phase IIIA Contract No. 308.01C Geotechnical Data Report (Dec 2019)	B17-41	287414	359505	12.8	25.0	-12.2	x	GS	-	-
	B17-42	285820	359764	42.9	30.6	12.3	-	GS	-	-
Taft St - Pleasant St Branch Interceptor Section B Contract 18 (1950)	212	285883	359896	39.0	28.0	11.0	-	-	-	-
	213	286224	359637	31.0	25.0	6.0	-	-	-	-
	214	286621	359523	32.6	21.0	11.6	-	-	-	-
	215	287097	359509	30.0	15.0	15.0	-	-	-	-
Tidewater Facilities (GZA Boring Program)	B-206	286636	359602	35.6	30.0	5.6	-	-	see note 6	15.6 to 26.6
	MW5/TB14	286405	359657	29.4	22.0	7.4	-	-		13.87 to 25.4
	MW7/TB-20	286424	359654	29.2	25.0	4.2	-	-		14.2 to 4.2
	B-208	286116	359934	26.4	20.0	6.4	-	-		16.4 to 6.4
	B-209	286066	360026	22.7	19.0	3.7	-	-		13.7 to 3.7

Notes
1. Table D.2 includes a summary of data by others deemed relevant for inclusion into the NBC Phase III CSO Program, Consolidation Conduits IIIA4 and IIIA5, Geotechnical Data Report (GDR).
2. Horizontal coordinates projected to Rhode Island Mainland State Plane, North American Datum (NAD), 1983. Locations of Taft St-Pleasant St and Tidewater borings B-26. B-208, and B-209 are estimated based on visual review of the project reference documents indicated.

3. Elevations referenced to the National Geodetic Vertical Datum (NGVD) 1929, in feet.
4. Laboratory testing acronyms include GS=Grain Size Distribution.
5. "x" indicates data available. " -" indicates no data included in project reference document.
6. Groundwater wells installed for analytical testing. No groundwater monitoring data available.

Phase IIIA-4 Historic Data

Pawtucket Tunnel RFP GDR

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 2/23/2018
FINISH 3/9/2018
DRILLER NEBC
LOGGED BY MED/HMS
CHECKED BY SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	4	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile Drill B-52
Bit Type: 3 7/8" Tricone
Drill Fluid: Water
Casing: 5" (20') / 4" (23.3')
Hoist/Hammer: Automatic Hammer

ELEVATION 31.1 **NORTHING** 288425.051
DATUM NGVD 1929 **EASTING** 359394.337
LOCATION Jenks Way/Masonic Temple

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	31.1									
		4		S-1	/	0 - 2	SW		Moist, brown, fine to coarse SAND and fine to coarse GRAVEL, trace silt, trace brick. (FILL)	PID = 0.0 ppm (0'-2') 4" Topsoil. Hand excavated. Several cobbles. Composite environmental sample taken (0'-4'). (1) 8 oz. Amber, (1) VOA at 1'.
		6								
		100+	10-9-10-8 (19)	S-2	18 / 24	2 - 4	SW		Top 6": Moist, medium dense, brown, fine to coarse SAND, trace brick. (FILL) Middle 3": Gray, coarse GRAVEL. (FILL) Bottom 9": Tan, fine SAND, some silt, trace brick. (FILL)	PID = 2.2 ppm (2'-4')
		100+								
5	26.1	10	12-10-8-10 (18)	S-3	15 / 24	4 - 6	SM		Moist, medium dense, tan, fine SAND, some silt, trace medium to coarse sand. (FILL)	PID = 6.4 ppm (4'-6') Composite environmental sample taken (4'-10').
		15								
		20	6-6-5-5 (11)	S-4	8 / 24	6 - 8	SM		Moist, medium dense, light tan, fine SAND, little silt, little medium to coarse sand, trace fine gravel.	PID = 4.2 ppm (6'-8') Red seam at mid recovery. Composite environmental sample taken (4'-11'). (1) 8 oz. Amber, (1) VOA at 5'.
		80								
		50	4-7-7-6 (14)	S-5	9 / 24	8 - 10	SM		Top 4": Moist, medium dense, tan, fine to medium SAND, some silt. (FILL) Middle 2": Gray, fractured coarse GRAVEL. (FILL) Bottom 3": Brown, fine to medium SAND, some silt, trace brick. (FILL)	PID = 0.2 ppm (8'-10')
		63								
10	21.1	50	6-3-4-3 (7)	S-6	0 / 24	10 - 12			No Recovery. Coarse gravel in tip.	Drilling color brown through zone.
		50								
		40	4-6-4-6 (10)	S-7	12 / 24	12 - 14	SP		Top 3": Dark Brown to black, fine to coarse SAND, little gravel, little silt. (Petroleum-like Odor). (FILL) Bottom 9": Brown to tan, fine to medium SAND, little silt. (FILL)	Top 3" PID = 0.4 ppm Bottom 9" PID = 0.8 ppm Environmental sample taken (12'-13'). (1) 8 oz. Amber, (1) VOA.
		40								
15	16.1	20	3-7-3-3 (10)	S-8	4 / 24	14 - 16	SP-SM		Moist, loose, dark brown, fine to medium SAND, little gravel, little silt, trace coarse sand. (FILL)	PID = 4.2 ppm
		20								
		75	60/0"	S-9	0 / 0	16 - 18			No Recovery. Split spoon refusal at 16'.	Driller advanced the roller bit through a boulder at approximately 16.5'.
		125								
		X							No Samples Taken.	
20	11.1	X								
		X								
		X								Driller advanced the roller bit through a boulder at approximately 21'.
		X								
		X	17-121/5"	S-10	9 / 11	22.7 - 23.6	GW		Wet, very dense, tan to gray, fine to coarse GRAVEL, some fine to coarse sand, trace silt.	

Bottom of borehole at 23.60 feet.

Driller advanced the roller bit to 25'.

WATER LEVEL DATA

DATE/TIME	DEPTH (ft.) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
2/26/2018 8:30:00 AM	16	16	15
2/28/2018 8:00:00 AM	23.3	74.5	14.3
3/5/2018 8:45:00 AM	23.3	134.1	13.8
3/6/2018 8:00:00 AM	23.3	159.2	11.8
3/9/2018 8:00:00 AM	23.3	219.9	9.3

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. Hand excavated from 0'-2'.
2. S-7: Top 3" was environmentally sampled. Bottom was taken for geotechnical sample.
3. Coarse gravel in tip of S-8.
4. Spin-shoe on the bottom of the 4" casing from 18 ft - no casing blows counted below this depth.
5. Removed 20' of 5" casing and installed 4' casing down to approximately 23.3'.
6. "X" within casing blows indicates that blows were not counted at that interval.

TEST BORING REPORT - GINT STD US LAB.GDT - 9/12/19 12:26 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS-090319.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS
20.0										
20.5										
21.0										
21.5										
22.0										
22.5										
23.0										See Test Boring report
23.5										
24.0									23.6	Weathered Rock - No Sample Taken
24.5										
25.0	1.25	C-1	25 - 25.2	6.1 - 5.9	2 100%	0 0%	4		25.0	Strong to very strong, purple SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°. - Orthogonal joint around 25.8'.
25.5	3.25	C-2	25.2 - 29.6	5.9 - 1.5	52.5 100%	38 72%				
26.0										
26.5	2.25						1			
27.0	2.75								26.7	Strong to very strong, gray, fine SANDSTONE, massive, fresh.
27.5							5		27.1	Moderately strong to strong, purple SILTSTONE, laminated 1-2 mm, fresh. - Orthogonal joint at 27.9'. - Bedding planes 40°-50°.
28.0	2.75									
28.5							1			
29.0	2.75								28.6	Strong to very strong, purple SILTSTONE interlaminated with gray, fine to medium Sandstone, laminated 1-2 mm, fresh. - Bedding planes 40°-50°. - Quartz vein at 29.2, 5 mm±.
29.5	2.75						0		29.3	
30.0		C-3	29.6 - 34.8	1.5 - -3.7	62 100%	51 82%				
30.5	2.5						3			Strong to very strong, purple and light gray SILTSTONE, massive, fresh. - Quartz vein at 29.5', 1 mm±.
31.0									30.9	Strong to very strong, gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.
31.5	3						3			
32.0									31.7	Strong to very strong, purple SILTSTONE, massive, fresh.
32.5	3.25						3			
33.0									32.6	Strong to very strong, purple and gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°. - Quartz vein at 33.5', 1 mm±.
33.5	3						2			
34.0										
34.5							1		34.3	Strong to very strong, purple and light gray, fine SANDSTONE interlaminated with Siltstone,
35.0	3	C-4	34.8	-3.7	61	53			34.8	

DISCONTINUITIES

Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
25.1	B	1	40	SM	F	None
25.6	B	1	50	SM	F	None
25.7	J	1	60	SM	F	None
25.8-26.0	J	1	60	SM	F	None
26.5	J	1	35	SM	F	None
27.0	J	1	35	SM	SW	Fe
27.2-27.4	J	1	60	SM	SW	Fe
27.6	B	1	50	SM	F	None
27.9	B	1	55	SM	F	None
27.9	J	1	30	SM	F	None
28.7	B	1	50	SM	F	None
-	-	-	-	-	-	-
30.3	J	1	40	SM	F	None
30.5	J	1	30	SM	F	None
30.4-30.8	J	1	65	SM	F	None
31.3	B	1	45	SM	F	None
31.3	J	1	25	SM	F	None
31.6	B	1	45	SM	F	None
32.0-32.4	J	1	75	SR	F	None
32.3	J	1	15	SM	F	None
32.4	J	1	30	SM	F	None
33.0	J	1	45	SM	F	None
33.5	B	1	45	SM	F	None
34.1	B	1	40	SM	F	None

REMARKS:
1. Dip angles are measured from horizontal (i.e., perpendicular to the core axis).

WATER LEVEL DATA

DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER
2/26/2018 8:30:00 AM	16	16	15
2/28/2018 8:00:00 AM	23.3	74.5	14.3
3/5/2018 8:45:00 AM	23.3	134.1	13.8
3/6/2018 8:00:00 AM	23.3	159.2	11.8
3/9/2018 8:00:00 AM	23.3	219.9	9.3

GROUND SURFACE EL. 31.1

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

BORING NUMBER B17-8

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
35.0			- 39.9	- -8.8	100%	87%											
35.5							1			laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	35.7	B	1	45	SM	F	None
36.0	2.5								35.6	Strong to very strong, light gray, fine SANDSTONE, massive, fresh. *(continued)*							
36.5							1			Strong to very strong, purple and light gray, fine SANDSTONE interlaminated with Siltstone, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	36.8	B	1	45	SM	F	None
37.0	2.75																
37.5							4				37.3 37.3-37.7 37.6 37.9	B J J B	1 1 1 1	50 85 40 50	SM SR SR SM	F F F F	None None None None
38.0	2.75								37.9	Strong to very strong, purple SILTSTONE, massive, fresh.							
38.5							1		38.4	Strong to very strong, purple and gray, coarse SANDSTONE, massive, fresh.	38.8	B	1	40	SM	F	None
39.0	3.25								38.8								
39.5							1			Strong to very strong, purple, fine SANDSTONE interlaminated with Siltstone, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	39.4	B	1	40	SM	F	None
40.0	3.5	C-5	39.9 - 45	-8.8 - -13.9	58.5 96%	39 64%			39.9	Strong to very strong, purple SILTSTONE, massive, fresh.							
40.5							0				-	-	-	-	-	-	-
41.0	2.5								40.6	Strong to very strong, purple, fine SANDSTONE, massive, fresh. - Orthogonal joint at 41.1'.							
41.5							4		41.4	Strong to very strong, purple SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	41.3 41.3 41.6 41.9	J J B J	1 1 1 1	35 40 50 40	SM SM SM SM	F F F F	None None None None
42.0	2.5								41.7								
42.5							1		42.6	Strong to very strong, light gray, fine to medium SANDSTONE, massive, fresh.	42.6	J	1	35	SM	F	None
43.0	2.25																
43.5							3			Strong to very strong, light gray, fine SANDSTONE, massive, fresh. - Quartz vein at 42.4', 1 mm±.	43.4	J	1	40	SM	F	None
44.0	2.5								43.9	Strong to very strong, purple SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.							
44.5							1				44.1 44.3 44.1-44.8	B B J	1 1 1	45 40 70	SM SM SR	F F F	None None None
45.0	4.75	C-6	45 - 50	-13.9 - -18.9	60 100%	43 72%			44.6	Strong to very strong, light gray, fine to medium SANDSTONE, massive, fresh. - Orthogonal joint at 45.0'.							
45.5							4		45.3		45.0 45.0 45.3 45.6	J J B B	1 1 1-2 1	40 40 45 40	SM SM SM SM	F F F F	None None None None
46.0	2.75									Strong to very strong, purple and light gray SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 30°-40°. - Quartz vein at 46.0', 4 mm±.							
46.5							1				46.0	B	1-2	40	SM	F	None
47.0	3																
47.5							0				-	-	-	-	-	-	-
48.0	3.5								47.7	Strong to very strong, light gray and purple, fine SANDSTONE, massive, fresh.							
48.5							1		48.5	Strong to very strong, purple and light gray SILTSTONE interlaminated with fine Sandstone, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	48.8	B	1-2	40	SM	F	None
49.0	3.25																
49.5							3				49.1 49.5 49.6	B B B	1-2 1 1-2	45 45 40	SM SM SM	F F F	None None None
50.0	3.5	C-7	50 - 55	-18.9 - -23.9	59 98%	59 98%											
50.5							1				50.9	B	1-8	45	SM	F	None
51.0	2.75								51.1								

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
51.5							0		Strong to very strong, purple and light gray, fine to coarse SANDSTONE, massive, fresh. *(continued)*	-	-	-	-	-	-	-
52.0	3							52.1	Strong to very strong, purple SILTSTONE interlaminated with fine Sandstone, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	52.1 52.8	J J	1 1-10	40 45	SM SM	F F	None None
52.5							2	52.8								
53.0	2.75							53.1								
53.5							1	53.2	Strong to very strong, purple and light gray, fine to medium SANDSTONE, massive, fresh.	53.2	J	1	45	SM	F	None
54.0	3								Strong to very strong, purple and light gray, conglomeratic SANDSTONE, massive, fresh.							
54.5							1	54.2	Strong to very strong, purple, fine SANDSTONE, massive, fresh.	54.2	J	1-10	45	SM	F	None
55.0	4.25	C-8	55 - 59.7	-23.9 - -28.6	57 100%	57 100%										
55.5							0	55.5	Strong to very strong, gray, purple and white CONGLOMERATE, massive, fresh.	-	-	-	-	-	-	-
56.0	3								Strong to very strong, gray, purple and white, conglomeratic SANDSTONE, massive, fresh.							
56.5							0			-	-	-	-	-	-	-
57.0	3.25															
57.5							0			-	-	-	-	-	-	-
58.0	3.25							58.0								
58.5							1	58.2	Strong to very strong, gray, purple and white CONGLOMERATE, massive, fresh.	58.2	J	1	55	SM	F	None
59.0	3.25							59.0	Strong to very strong, gray, purple and white, conglomeratic SANDSTONE, massive, fresh.							
59.5							0			-	-	-	-	-	-	-
60.0	3.75	C-9	59.7 - 64.5	-28.6 - -33.4	58 100%	54 93%		59.7	Strong to very strong, gray, fine SANDSTONE, massive, fresh.							
60.5							1		Strong to very strong, gray to purple CONGLOMERATE, massive, fresh.	60.2	J	1-3	20	SL/SM	F	None
61.0	4															
61.5	4						2	61.4	Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh.	61.4 61.6	J J	1-3 1	45 30	SM/R SM/R	F F	None None
62.0																
62.5	4.25						1	62.4	Strong to very strong, gray, fine SANDSTONE, massive, fresh.	62.9	J	1-2	35	SR	F	None
63.0								63.1	- Quartz vein with Pyrite near 63.0'.							
63.5	4.5						1		Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh.	63.3	J	1-2	40	SM	F	None
64.0								63.9								
64.5	5						0		Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
65.0		C-10	64.5 - 69.5	-33.4 - -38.4	60 100%	60 100%		64.6	Strong to very strong, gray CONGLOMERATE, massive, fresh.							
65.5	4						1	65.2	Strong to very strong, purple, fine SANDSTONE interbedded with SILTSTONE, bedded 10-20mm, fresh.	65.3	B	1-10	50	SM	F	None
66.0								66.2	- Bedding planes 40°-50°.							
66.5	4						1	66.5	Strong to very strong, purple SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 50°.	66.5	J	1-3	55	SR	F	None
67.0																
67.5	4.25						0	67.3	Strong to very strong, purple, fine SANDSTONE, massive, fresh.	-	-	-	-	-	-	-

2. Wash color gray/purple at ~56.0'.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

BORING NUMBER B17-8

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
68.0									67.9	- Quartz vein 67.1', 1 mm±.							
68.5	3.75						2		68.1	Strong to very strong, purple SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 50°.	68.2 68.8	J J	1 1	25 40	SM SR	F F	None None
69.0									68.9	Strong to very strong, gray, fine SANDSTONE, massive, fresh. *(continued)*							
69.5	3.5	C-11	69.5 - 74.5	-38.4 - -43.4	60 100%	51 85%	1				69.9	B	1-20	55	SM	SW	SI
70.0									69.8	Strong to very strong, gray to purple CONGLOMERATE, massive, fresh.							
70.5	2.75						1			Strong to very strong, gray to purple, fine to medium SANDSTONE, massive, fresh.	70.5	B	1-10	50	SM	F	None
71.0																	
71.5	3.5						0		71.3	Strong to very strong, purple and gray, fine SANDSTONE, laminated 3-5 mm, fresh. - Bedding planes 50°-60°.	-	-	-	-	-	-	-
72.0										Strong to very strong, gray and purple, fine SANDSTONE, massive, fresh. - Quartz vein 73.1', 5-10 mm±. - Orthogonal joints at 73.2'.							
72.5	3.75						2				72.7 72.8	J J	1 1-2	30 40	SM SM	F SW	None SI
73.0																	
73.5	3.75						4				73.0-73.3 73.2 73.9 73.9-74.1	J J J J	1 1 1 1-5	65 60 20 60	SM SM SM SR	F F F F	QZ None None None
74.0																	
74.5	4.5	C-12	74.5 - 79.2	-43.4 - -48.1	57 100%	55 96%	1				74.1	J	1-5	55	SM	F	None
75.0									74.6	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.							
75.5	4						0				-	-	-	-	-	-	-
76.0																	
76.5	3						0				-	-	-	-	-	-	-
77.0																	
77.5	3						2		77.2	Strong to very strong, gray, fine SANDSTONE, thickly bedded 10-25 mm± to massive, fresh. - Quartz vein at 78.4', 4 mm±. - Orthogonal joints at 79.1'. - Bedding planes 50°.	77.7 77.8	B J	1 1	50 15	SM SR	F F	None None
78.0																	
78.5	3.5						0				-	-	-	-	-	-	-
79.0																	
79.5	4	C-13	79.2 - 84.3	-48.1 - -53.2	61 100%	51 84%	4				79.1 79.1 79.2 79.8-80.1	J B B B	1 1 2 1-2	55 50 55 55	R SR SM SM	F F SW SW	QZ None None SI
80.0																	
80.5	3.75						3		80.1	Strong to very strong, gray to purple, fine to medium SANDSTONE, massive, fresh. - Quartz marbling 80.1' to 80.3'.	80.0-80.3 80.2 80.4	J J J	1 1 1	55 45 50	SM SM SM	F F F	None None None
81.0																	
81.5	4						0				-	-	-	-	-	-	-
82.0																	
82.5	3.75						2		82.2	Strong to very strong, gray to purple, fine SANDSTONE, thickly bedded 10-25 mm± to massive, fresh. - Bedding planes 40° - 50°.	82.7 82.8	B B	1 1	50 50	SM SM	F SW	None None
83.0																	
83.5	2.25						0				-	-	-	-	-	-	-
84.0																	
	3.25																

3. Barrel blocked at ~84.0'.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
84.5		C-14	84.3 - 89.4	-53.2 - -58.3	59 97%	59 97%	1			Strong to very strong, gray to purple, fine SANDSTONE, thickly bedded 10-25 mm± to massive, fresh. - Bedding planes 40° - 50°. *(continued)*	84.0	B	1	55	SM	F	None
85.0																	
85.5	4.5						1				85.4	B	1-3	50	SM	F	None
86.0																	
86.5	3.5						1		86.3	Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh. - Quartz vein 86.9', 1-10 mm±.	86.2-86.5	J	1-2	55	SM	F	SI
87.0									87.1	Strong to very strong, gray to purple, fine SANDSTONE, laminated 1-2 mm± to bedded 15-20mm±, fresh. - Bedding planes 50°-60°.							
87.5	4						1				87.3	B	1	55	SM	F	None
88.0																	
88.5	4						1				88.7	J	1-5	35	R	F	None
89.0																	
89.5	4	C-15	89.4 - 94.4	-58.3 - -63.3	60 100%	48 80%	0				-	-	-	-	-	-	-
90.0																	
90.5	3.75						2		90.4	Strong to very strong, gray, fine to medium SANDSTONE, bedding 10-20 mm±, fresh. - Bedding planes 45°. - Quartz vein at 91.4', 10 mm±.	90.1 90.3	J B	1 1	30 55	SM SM	F F	Fe None
91.0																	
91.5	4.25						2		91.5	Strong to very strong, gray, fine SANDSTONE, massive, fresh.	91.1-91.7 91.4	J J	10 1	70 0	SM SM	SW F	QZ/CA None
92.0																	
92.5	4						1		92.6	Strong to very strong, gray SILTSTONE, massive, fresh. - Quartz vein at 93.4', 3 mm±.	92.4	J	1	40	SR	F	None
93.0																	
93.5	4.25						4				93.1-93.7 93.6 93.5-94.2 93.7-94.0	J J J J	1 - 1 1	75 30 80 65	SM VR SR SM	F F F F	QZ None None None
94.0									93.8	Strong to very strong, gray, fine SANDSTONE, massive, fresh.							
94.5	4	C-16	94.4 - 99.4	-63.3 - -68.3	60 100%	55 92%	3				94.0 94.1 94.2	J J J	1 1 1	40 70 55	SM SM SM	F F F	None None None
95.0									94.5	Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh.							
95.5	3.25						0		94.9	Strong to very strong, gray, fine to medium SANDSTONE with Siltstone interbedding, laminated 1-2 mm± to bedded 20mm±, fresh. - Quartz vein at 96.0', 1 mm±. - Quartz vein at 96.2', 1-10 mm±.	-	-	-	-	-	-	-
96.0																	
96.5	3.5						ECF (1±)				96.2 96.6-97.1 96.7 96.9-97.0	J J J ECF	1 - - -	30 65 25 -	SM SM SM SM	F F F F	None QZ QZ QZ
97.0							4										
97.5	2.5						ECF (1±)		97.0	Strong to very strong, gray CONGLOMERATE, massive, fresh.	97.0-97.1	ECF	-	-	SM	F	QZ
98.0							1		97.6	Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh. - Quartz vein at 98.2', 2-5 mm±.							
98.5	3.25						0				-	-	-	-	-	-	-
99.0																	
99.5	3.5	C-17	99.4 - 104.5	-68.3 - -73.4	61 100%	61 100%	1				99.1	J	1-10	10	SR	F	None
100.0																	
100.5	3						0				-	-	-	-	-	-	-

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
101.0										Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh. - Quartz vein at 98.2', 2-5 mm±. *(continued)*							
101.5	3.25						0				-	-	-	-	-	-	-
102.0																	
102.5	3.5						0				-	-	-	-	-	-	-
103.0																	
103.5	4						3		103.2	Strong to very strong, gray CONGLOMERATE, massive, fresh. - Orthogonal joints 103.4'. - Orthogonal joints around 104.8'. - Quartz vein 107.0', 5 mm±.	103.4 103.4 103.7-104.1	J J J	1 1 1	35 40 70	R SM VR	F SW F	None None None
104.0																	
104.5	5.5	C-18	104.5 - 109.5	-73.4 - -78.4	60 100%	48 80%	3				104.7 104.7 104.9	J J J	1-5 1 1-10	35 20 30	SR VR R	F F F	None None None
105.0																	
105.5	3.5						0				-	-	-	-	-	-	-
106.0																	
106.5	6						0				-	-	-	-	-	-	-
107.0																	
107.5	2.5						ECF (4±)		107.2	Strong, gray SILTSTONE, massive, fresh. - Orthogonal joints around 108.3'.	107.2-107.6 107.6	ECF J	- 1	- 50	SM SM	SW F	None None
108.0							5										
108.5	3.25						2				108.2 108.3	J J	1 1	60 65	SM SM	F F	None None
109.0																	
109.5	5						2			- Quartz vein at 110', 2 mm±. - Orthogonal joints at 110', 113.8'.	109.5-109.7 109.7-110.0	J J	1 1	80 70	R SM	F F	None QZ
110.0		C-19	109.5 - 114.3	-78.4 - -83.2	58 100%	52 90%											
110.5	3						4				110.0 110.0 110.1-110.4 110.3	J J J J	1 1 1 1	50 35 65 45	SM SM SM SM	F F F F	QZ None QZ QZ
111.0																	
111.5	4						0				-	-	-	-	-	-	-
112.0																	
112.5	5						1				112.8-113.3	J	1	85	VR	F	None
113.0																	
113.5	4.25						3		113.3	Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°. - Quartz vein at 114.6', 5 mm±. - Quartz vein at 114.9', 20 mm±.	113.2 113.8 113.8	J B J	1 1 1	55 45 40	SM SM SM	SW F F	None None None
114.0																	
114.5	3.5	C-20	114.3 - 119.3	-83.2 - -88.2	60 100%	48 80%	2				114.3 114.8	B J	1 1	50 30	SM SM	F F	None QZ
115.0									115.0	Strong to very strong, gray, fine SANDSTONE interlaminated with Siltstone, bedding 1-20 mm, fresh. - Bedding planes 50°. - Orthogonal joints around 115.6', 116.4'.							
115.5	3.75						4				115.5-115.7 115.6 115.7 115.9-116.2	J B J B	1 1 1 1	60 50 30 50	SM SM SR SM	F SW F F	QZ None None None
116.0																	
116.5	3.75						4				116.0-116.4 116.0 116.4 116.5	J J J J	1 1 1 1	75 45 55 55	SR SM SR SM	F F F F	None None None None
117.0									116.5	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.							

4. Core barrel blocked at ~107.2'. Moved casing up and down to unblock.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
117.5	6.25						1		117.5	Very strong, white QUARTZ, massive, fresh with fragments of gray, fine to coarse Sandstone	117.3	J	1	35	SR	F	None
118.0																	
118.5	7.5						0				-	-	-	-	-	-	-
119.0																	
119.5	5	C-21	119.3 - 124.5	-88.2 - -93.4	62 100%	62 100%	ECF (3±)		119.3	Strong, gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 120.0', 10-35 mm±.	119.3-119.4	ECF	-	-	SM	F	QZ
120.0							3										
120.5	5						0				-	-	-	-	-	-	-
121.0																	
121.5	5.75						1				121.0	J	1-2	20	SR	F	None
122.0																	
122.5	4.5						1		122.7	Strong to very strong, dark gray, fine SANDSTONE, massive, fresh.	122.7	J	1-5	40	SR	F	QZ
123.0																	
123.5	4.5						0				-	-	-	-	-	-	-
124.0																	
124.5	3.5	C-22	124.5 - 129.4	-93.4 - -98.3	59 100%	54 92%	2				124.0 124.8	J J	1-5 1	40 30	R SR	F F	None None
125.0																	
125.5	4						0		125.3	Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm, fresh.	-	-	-	-	-	-	-
126.0									126.0	- Bedding planes 30°-40°.							
126.5	4						1			Strong to very strong, fine to medium SANDSTONE, massive, fresh.	126.8	J	1	35	SM	F	QZ
127.0									126.6	Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.							
127.5	3.75						1				127.0	B	1	40	SM	F	None
128.0																	
128.5	5.75						0				-	-	-	-	-	-	-
129.0																	
129.5	4.5	C-23	129.4 - 134.1	-98.3 - -103.0	56 100%	42 75%	0		129.6	Strong to very strong, dark gray, fine to medium SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
130.0																	
130.5	3.75						0				-	-	-	-	-	-	-
131.0									130.9	Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 50°. - Quartz vein 131.2', 2 mm±. - Orthogonal joints around 131.1'.							
131.5	3.5						3		131.4		131.0 131.2 131.7-132.0	J B J	1 1 1	40 50 60	SM SM R	F SW F	None QZ QZ
132.0																	
132.5	4						1		132.6	Strong to very strong, dark gray, fine to medium SANDSTONE, massive, fresh.	132.6	J	1	45	R	F	None
133.0																	
133.5	4						3			Strong to very strong, dark gray, fine SANDSTONE, massive, fresh.	133.0 133.1-133.4 133.3	J J J	1 1 1	45 75 45	SR SR SR	F F F	None QZ None

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

BORING NUMBER B17-8

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
134.0	5.75	C-24	134.1 - 139.1	-103.0 - -108.0	60 100%	54 90%	0			Strong to very strong, dark gray, fine SANDSTONE, massive, fresh. *(continued)*	-	-	-	-	-	-	-
134.5									134.9	Strong, dark gray, fine to medium SANDSTONE interlaminated with Siltstone, fresh. - Bedding planes 50°-60°.							
135.0	4.5						1				135.3	J	1	30	SM	F	PY
135.5																	
136.0	4.5						0				-	-	-	-	-	-	-
136.5																	
137.0	4.75						0				-	-	-	-	-	-	-
137.5																	
138.0	2.75						5		138.0	Strong to very strong, dark gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 138.1', 7 mm±. - Orthogonal joints at 138.0'.	138.0 138.0 138.6 138.7 138.7	J J J J J	1 1 1 1 1	30 35 25 25 45	SM SM SR SM SM	F F F F SW	None QZ/PY None None QZ
138.5									138.6								
139.0	3.75	C-25	139.1 - 144.2	-108.0 - -113.1	61 100%	55 90%	ECF (1±)			Strong to very strong, gray, fine SANDSTONE, massive, fresh. - Quartz marbling 139.0'-139.1'.	139.0-139.1 139.4 139.4-139.6	ECF J J	- 10 1	- 20 55	SM VR SM	SW SW F	QZ None None
139.5																	
140.0							3										
140.5	3.5						0				-	-	-	-	-	-	-
141.0																	
141.5	6.75						1		141.1	Very strong, gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 142.7', 15 mm±.	141.0	J	1	20	SR	F	None
142.0																	
142.5	7						1				142.8	J	1	15	SR	F	None
143.0																	
143.5	4.75						1		143.2 143.5	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.	143.5	J	1	35	SM	F	None
144.0									143.9	Strong, dark gray, fine SANDSTONE, massive, fresh.							
144.5	5.5	C-26	144.2 - 149.1	-113.1 - -118.0	59 100%	59 100%	1			Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.	144.9	J	1-2	30	SM	F	QZ
145.0									144.9								
145.5	6.5						1			Strong, gray, fine to medium SANDSTONE, massive, fresh. - Orthogonal joints 145.0'.	145.0	J	1	55	SM	SW	QZ
146.0									145.6								
146.5	6						0			Very strong, gray CONGLOMERATE, massive, fresh. - Quartz vein at 146.3', 20 mm±.	-	-	-	-	-	-	-
147.0									146.5	Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh.							
147.5	7						1	× × × × × ×	147.4 147.7	Strong, dark gray SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 50°.	147.3	J	1	15	SR	F	None
148.0																	
148.5	7.25						1			Moderately strong, gray, CONGLOMERATE, massive, fresh. - Quartz vein at 147.8', 1-40 mm±.	148.2	J	1	40	SR	F	None
149.0																	
149.5	6.5	C-27	149.1 - 154.2	-118.0 - -123.1	61 100%	61 100%	0				-	-	-	-	-	-	-
150.0	6.75																

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

BORING NUMBER B17-8

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
150.5							1			Moderately strong, gray, CONGLOMERATE, massive, fresh. - Quartz vein at 147.8', 1-40 mm±. *(continued)*	150.8	J	1-2	50	R	F	None
151.0	6.75																
151.5							1				151.9	J	1	45	SM	F	None
152.0	7.25																
152.5							0		152.2	Very strong, gray, conglomeratic SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
153.0	7.25								152.8	Very strong, gray, CONGLOMERATE, massive, fresh.							
153.5							1		153.0	Very strong, gray, fine to medium SANDSTONE, massive, fresh.	153.5	J	1-2	10	SR	F	None
154.0	4.75								153.5								
154.5		C-28	154.2 - 159.4	-123.1 - -128.3	60 97%	60 97%	0		153.7	Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes 30°.	-	-	-	-	-	-	-
155.0	4.5								154.7	Strong to very strong, gray, fine SANDSTONE, massive, fresh.							
155.5							3			Very strong, gray, fine to medium SANDSTONE, massive, fresh.	155.5-156.1 155.9 155.9	J J J	1 1 1	70 0 45	SR SR VR	F F F	None None None
156.0	4																
156.5							1		156.2	Strong to very strong, dark gray, fine SANDSTONE, massive, fresh.	156.9	B	1	35	SM	F	None
157.0	4.25								156.7	Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm to bedded 5-20 mm, fresh. - Bedding planes 30°-40°.							
157.5							2				157.2 157.9	B B	1 1	40 35	SM SM	SW F	None None
158.0	5								157.9	Strong to very strong, dark gray, fine to medium SANDSTONE, bedding 1-20 mm, fresh. - Bedding planes 30°-40°.							
158.5							1				158.4	J	1	25	SR	F	None
159.0																	
159.5	5.25	C-29	159.4 - 164.5	-128.3 - -133.4	61 100%	46 75%	0		159.4	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
160.0	5								160.2	Strong to very strong, dark gray SILTSTONE, massive, fresh.							
160.5							4		160.3		160.4 160.7 160.9 160.9	J J B J	1 1 1 1	50 45 40 20	SR SM SM SR	F F F F	None PY None None
161.0									160.4	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.							
161.5	4.75						1			Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes at 30°-40°. - Orthogonal joints at 160.4'.	161.0	B	1	40	SM	F	PY
162.0																	
162.5	5.25						0				-	-	-	-	-	-	-
163.0									162.8	Strong to very strong, dark gray, fine to medium SANDSTONE, massive, fresh. - Quartz marbling at 162.9'-163.0'.							
163.5	4.25						2		163.1		163.0 163.3	B J	1 1	45 30	SM SR	F F	QZ QZ
164.0										Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm, fresh. - Orthogonal joints 163.3'. - Bedding planes 40°-50°.							
164.5	5.25						2		164.5		164.1-164.4 164.3	J B	1-30 1	60 45	SR SM	SW F	QZ None
165.0		C-30	164.5 - 169.6	-133.4 - -138.5	61 100%	54.5 89%											
165.5	3.5						1		165.0	Strong to very strong, gray, fine SANDSTONE, bedding 10-50 mm, fresh. - Quartz marbling 164.7' - 164.8'.	165.0	J	4	40	SM	F	QZ
166.0																	
166.5	4.25						0			Strong, dark gray, fine SANDSTONE, massive, fresh.	-	-	-	-	-	-	-

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

BORING NUMBER B17-8

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
167.0										Strong, dark gray, fine SANDSTONE, massive, fresh. *(continued)*							
167.5	5.25						1				167.9	J	1	20	VR	F	None
168.0									167.8	Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh.							
168.5	5.25						3				168.8 168.8 168.9	J B B	1 1 1	25 40 45	VR SM SM	F SW F	QZ/PY PY None
169.0									168.7	Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm, fresh.							
169.5	4.5						1		169.2	- Bedding planes 40°-45°. - Orthogonal joints 168.8'.	169.4	J	1	55	SM	F	None
170.0		C-31	169.6 - 174.7	-138.5 - -143.6	61 100%	61 100%			169.9	Strong to very strong, dark gray SILTSTONE, massive, fresh.							
170.5	3.5						0			Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 40°-50°.	-	-	-	-	-	-	-
171.0																	
171.5	3.75						4		171.3	- Quartz vein 171.3', 1-5 mm±.	171.2 171.2 171.3 171.6	B J B J	1 1 1 1	40 25 45 45	SR SM SR SR	SW F SW F	None None None QZ
172.0										Moderately strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh. - Orthogonal joints around 173.2'.							
172.5	3.75						0				-	-	-	-	-	-	-
173.0																	
173.5	5.5						3				173.2 173.3 173.8	J J J	2 2 1-2	60 35 30	SR SR SR	F F SW	QZ None None
174.0																	
174.5	4.75						0		174.5	Moderately strong to very strong, gray, fine to medium SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
175.0		C-32	174.7 - 179.7	-143.6 - -148.6	60 100%	57.5 96%											
175.5	5.5						0		175.2	Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 175.7', 5 mm±.	-	-	-	-	-	-	-
176.0																	
176.5	4.75						1		176.2	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh. - Quartz vein at 176.3', 20 mm±.	176.9	J	1-2	30	SM	F	QZ
177.0																	
177.5	5.5						1				177.1	J	1-5	25	SM	F	QZ
178.0																	
178.5	5.5						0		178.0	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
179.0									178.6	Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh.							
179.5	7						1		179.2 179.4	Strong to very strong, dark gray SILTSTONE, massive, fresh.	179.3	J	1-30	60	VR	F	None
180.0		C-33	179.7 - 184.9	-148.6 - -153.8	62 100%	50 81%											
180.5	3.75						4		180.2	Strong to very strong, gray, conglomeratic SANDSTONE, massive, fresh.	180.1-180.4 180.2 180.4 180.7	J J J J	1-3 1 1 1-5	60 60 15 50	SR SM SM VR	F F F F	None QZ None None
181.0										Strong to very strong, dark gray, fine SANDSTONE, laminated 1 mm±, fresh. - Orthogonal joints around 180.4'. - Bedding planes 30°-40°.							
181.5	4						1				181.0	S	1	25	SL	F	PY
182.0																	
182.5	3.75						4		182.0 182.6	Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh. - Orthogonal joints around 182.3'. - Quartz vein at 182.4', 7 mm±.	182.3 182.3 182.4 182.6	J J J B	1-3 7 1-2 1-2	40 45 50 40	SM SR SM SR	F SW F F	PY QZ PY QZ
183.0																	

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

(Continued Next Page)

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
183.5							1			Strong to very strong, dark gray, fine to medium SANDSTONE interlaminated with Siltstone, fresh. - Bedding planes 40°. *(continued)*	183.5	B	1-5	40	SR	F	PY
184.0	5								184.1								
184.5							0			Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 30°-40°. - Quartz vein at 184.9'-185.5', 1 mm±, 85°. - Quartz vein at 185.4', 1-3 mm±.	-	-	-	-	-	-	-
185.0	4.25	C-34	184.9 - 190	-153.8 - -158.9	59 97%	59 97%											
185.5							1				185.6	J	1	25	SM	SW	QZ
186.0	3.25																
186.5							0				-	-	-	-	-	-	-
187.0	4								187.1								
187.5							0			Strong to very strong, dark gray, fine SANDSTONE, massive, fresh. - Quartz vein at 188.0', 1 mm±.	-	-	-	-	-	-	-
188.0	3.5																
188.5							2				188.0 188.5	J J	1 1	5 5	SM SR	F F	QZ None
189.0	5								189.0								
189.5							1			Strong to very strong, gray, conglomeratic coarse SANDSTONE, massive, fresh - Quartz vein at 189.0', 2 mm±.	189.0	J	1	40	SM	F	QZ
190.0	4.5	C-35	190 - 195.1	-158.9 - -164.0	61 100%	57 93%			190.0								
190.5							0			Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
191.0	4.25																
191.5							0				-	-	-	-	-	-	-
192.0	4																
192.5							2				192.6-193.3 192.9	J J	1 1	85 0	VR SM	F F	QZ None
193.0	4																
193.5							1				193.4	J	1	20	SM	F	QZ
194.0	4.5								193.7	Strong to very strong, gray CONGLOMERATE, massive, fresh.							
194.5							3		193.9 194.3 194.5	Strong to very strong, gray, fine SANDSTONE, massive, fresh.	194.2 194.5 194.9	J S J	1 1 1	50 15 5	SM SL SM	F F F	QZ QZ None
195.0	4.25	C-36	195.1 - 200.1	-164.0 - -169.0	60 100%	60 100%				Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm, fresh. - Bedding planes.							
195.5							1				195.4	S	1	20	SL	F	None
196.0	3.5									Strong to very strong, gray, fine SANDSTONE, massive, fresh.							
196.5							1		196.1 196.2	Strong to very strong, dark gray, CONGLOMERATE, massive, fresh.	196.1	J	1	20	SM	F	QZ
197.0	4									Strong to very strong, dark gray, fine SANDSTONE, laminated 1 mm±, fresh.							
197.5							1		197.1 197.2 197.4 197.5 197.7	- Bedding planes 20°-30°. Strong to very strong, dark gray, CONGLOMERATE, massive, fresh.	197.5	S	1	20	SL	F	QZ
198.0	4.5																
198.5							0			Strong to very strong, dark gray SILTSTONE, massive, fresh.	-	-	-	-	-	-	-
199.0	5									Strong to very strong, dark gray, fine to medium SANDSTONE, massive, fresh.							
199.5							0		199.5	Strong to very strong, dark gray	-	-	-	-	-	-	-

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

CORE BORING REPORT

BORING NUMBER B17-8

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS
200.0	4.75									SILTSTONE, massive, fresh.
200.5		C-37	200.1 - 205	-169.0 - -173.9	59 100%	56 95%	0		200.2	Strong to very strong, dark gray, fine to coarse SANDSTONE, bedding 10-20 mm±, fresh. - Quartz vein at 198.6', 1-40 mm±. - Bedding planes 30°.
201.0	3.25								200.5	
201.5							3		200.9	Strong to very strong, dark gray, conglomeratic SANDSTONE, massive, fresh. *(continued)*
202.0	4.5								201.9	Strong to very strong, dark gray, fine SANDSTONE, massive, fresh.
202.5							1			Strong to very strong, gray, fine to medium SANDSTONE, massive, fresh
203.0	4.5									
203.5							1			Strong to very strong, dark gray, fine to coarse SANDSTONE, massive, fresh. - Quartz vein at 200.3', 2 mm±. - Quartz vein at 200.6', 3 mm±. - Quartz vein at 201.8', 2 mm±. - Quartz vein at 201.7', 1 mm±.
204.0	4.25									
204.5							0		204.2	
205.0	4.25									Strong to very strong, dark gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 202.2'-202.5', 1 mm±, 65°. - Quartz vein at 203.0', 1 mm±. - Quartz vein at 203.1', 1 mm±.
205.5		C-38	205 - 210	-173.9 - -178.9	60 100%	60 100%	0	× × ×	205.1	
206.0	3.25								205.7	
206.5							1		206.4	Strong to very strong, dark gray, fine SANDSTONE, massive, fresh.
207.0	3.5								206.8	Strong to very strong, dark gray to black SILTSTONE, laminated 1-2 mm±, fresh. - Bedding planes 30°-40°.
207.5							1			
208.0	3.25									Strong to very strong, dark gray SILTSTONE, massive, fresh.
208.5							1	× × ×	208.3	Strong to very strong, dark gray to black SILTSTONE, laminated 1-2 mm±, fresh. - Bedding planes 30°-40°.
209.0	3.5								208.6	
209.5							0		209.2	Strong to very strong, dark gray, fine SANDSTONE, massive, fresh. - Quartz vein at 207.0', 1 mm±.
210.0	5.5									Strong to very strong, dark gray to black SILTSTONE, massive, fresh.
210.5		C-39	210 - 214.8	-178.9 - -183.7	57 98%	34.5 59%	0			Strong to very strong, dark gray, fine to medium SANDSTONE, laminated 1-2 mm±, fresh. - Bedding planes 30°-40°.
211.0	3.25									
211.5							3			Strong to very strong, dark gray, fine SANDSTONE, massive, fresh. - Quartz vein at 209.4', 3 mm±.
212.0	4							× × ×	211.7	
212.5							5	× × ×		Strong to very strong, dark gray SILTSTONE, laminated 1-2 mm±m fresh. - Bedding planes 20°-30°. - Quartz vein at 212.0', 2 mm±. - Quartz marbling 212.3'-212.5'.
213.0	5.25								212.9	
213.5							1			Strong to very strong, dark gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 214.7', 30 mm±. - Orthogonal joints 214.5'.
214.0	5.75									
214.5							3			
215.0	4.75	C-40	214.8 - 219.9	-183.7 - -188.8	61 100%	51.5 94%				
215.5							3		215.3	Strong, dark gray, fine SANDSTONE, massive, fresh.
216.0	4								215.7	

DISCONTINUITIES

Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
-	-	-	-	-	-	-
201.6-202.4 201.8 201.9	J J J	1 1 1	80 10 0	SR SR VR	F F F	QZ None None
202.7	S	1-2	10	SL	F	QZ
203.3	J	1	20	SM	F	None
-	-	-	-	-	-	-
-	-	-	-	-	-	-
206.1	J	1	15	SM	F	QZ
207.8-208.6	J	1	80	SM	F	QZ/PY
208.3	J	1	15	SM	F	None
-	-	-	-	-	-	-
-	-	-	-	-	-	-
211.0 211.1-211.9 211.6	J J J	1 1 1	15 80 30	SR SM SR	F F F	QZ QZ/PY None
212.0 212.0-212.2 212.4 212.6 212.6-212.9	J J J J J	1 1 1 1 1	15 60 50 30 60	SR SR SR VR SM	F SW SW F SW	None None None QZ None
213.0	S	1	30	SL	SW	PY
214.2 214.5 214.5	J J J	1 1 1	50 30 50	SR SR SR	SW SW SW	None None None
215.4 215.5 215.7	J S S	2 1 1	55 30 30	SM SL SL	SW F F	None None None

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-8

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
216.5							1			Strong to very strong, gray CONGLOMERATE, massive, fresh. - Quartz vein at 215.9', 10 mm±. - Quartz vein at 217.9', 5 mm±. *(continued)*	216.7	J	1	55	VR	F	None
217.0	5.5																
217.5							0				-	-	-	-	-	-	-
218.0	5																
218.5							1				218.0	J	1	50	VR	F	None
219.0	3.25																
219.5							1		219.0	Strong, dark gray, fine SANDSTONE, massive, fresh.	219.0	J	1	0	SR	F	None
220.0	6.25	C-41	219.9 - 225.1	-188.8 - -194.0	61 100%	51.5 84%											
220.5							3		220.1	Strong, gray, conglomeratic SANDSTONE, massive, fresh.	220.0 220.0-220.4 220.1	J J J	1 1 1	15 65 0	VR SR VR	SW F F	None None None
221.0	4								220.6	Strong to very strong, gray, fine to coarse SANDSTONE, massive, fresh.							
221.5							2				221.0-221.4 221.4	J J	1 1	70 60	SR R	F F	QZ None
222.0	5																
222.5							2	× × ×	222.4 222.6	Strong, dark gray SILTSTONE with graphite interlaminations, fresh. - Quartz vein at 222.6', 10 mm±. - Bedding planes 30°-40°.	222.1 222.5	J J	1 1	55 45	SR SM	F SW	None SI
223.0	4.25																
223.5							3			Strong to very strong, dark gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 30°-40°. - Quartz vein at 222.8', 5 mm±.	223.3 223.4 223.7	B B B	1 1 1	35 35 35	SM SM SM	SW SW F	SI None QZ
224.0	4.5																
224.5							3				224.1 224.5 224.6	B B B	1 1 1	35 30 30	SR SM SM	F SW SW	None SI None
225.0	3.75																
225.5		C-42	225.1 - 230	-194.0 - -198.9	60 100%	45 75%	2	× × ×	225.2 225.4	Strong, gray, fine to medium SANDSTONE, massive, fresh.	225.4 225.7	J B	1 1	35 30	SM SM	F SW	None None
226.0	3							× × ×	226.0	Strong, dark gray to black SILTSTONE with graphite interlaminations, fresh. - Bedding planes 30°.							
226.5							1				226.1	B	1	25	SR	F	None
227.0	3.5							× × ×	227.0	Strong to very strong, gray, fine SANDSTONE, laminated 1-2 mm, fresh. - Bedding planes 25°.							
227.5							ECF (3±)	× × ×			227.0-227.1 227.1 227.3 227.8	ECF S J J	- 1 1 1	- 20 50 45	SM SL SM SR	SW SW F F	None QZ QZ QZ
228.0	3.5						5	× × ×	228.0	Strong, dark gray SILTSTONE, laminated 1-2 mm±, fresh. - Bedding planes 30°-40°.							
228.5							1			Strong to very strong, gray, fine to medium SANDSTONE, bedding 1-50 mm±, fresh. - Bedding planes 35°-40°.	228.0	B	1	40	SM	F	None
229.0	4																
229.5							2				229.1 229.2	S J	1 1	25 30	SL SR	F F	None QZ
230.0																	
230.5										**Bottom of borehole at 230.0 feet.**							
231.0																	
231.5																	
232.0																	
232.5																	

5. Boring was backfilled with cement bentonite grout from 230.0 feet to 38.4 feet. A groundwater monitoring well was installed from 38.4 feet to the ground surface. This wall appeared to not function properly, and was removed in June 2019. The boring was backfilled with cement-bentonite grout to the ground surface. Please see the well installation log for additional details.

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/12/19 12:23 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 8/2/2019
FINISH 8/8/2019
DRILLER NEBC
LOGGED BY MLP
CHECKED BY RKM/SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	4/5	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile B-53
Bit Type: 4 7/8" Tricone / 3 7/8" Tricone
Drill Fluid: Water
Casing: 5" (17.8') / 4" (19.0')
Hoist/Hammer: Automatic Hammer

ELEVATION 24.6 **NORTHING** 2882698.809
DATUM NGVD 1929 **EASTING** 359379.301
LOCATION Masonic Temple Parking Lot

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	24.6									
		26 42	17-15-17-9/3"	S-1	13 / 21	0.25 - 2	SP		Moist, dense, brown, fine to medium SAND, some fine to coarse gravel, trace coarse sand, trace silt. (FILL)	ASPHALT PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		32 35	11-6-6-4 (12)	S-2	16 / 24	2 - 4	SP		Moist, medium dense, light brown, fine to medium SAND, trace coarse sand, trace fine gravel, trace silt. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
5	19.6	29 63	3-5-4-3 (9)	S-3	17 / 24	4 - 6	SP		Moist, loose, brown, fine to medium SAND, little fine to coarse gravel, trace coarse sand, trace silt, trace brick, trace asphalt. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		106 X	6-6-13-13 (19)	S-4	15 / 24	6 - 8	SW		Moist, medium dense, dark gray, fine to coarse SAND, some fine to coarse gravel, trace coarse sand, trace silt, trace glass, trace organics. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		142 X	16-16-13-8 (29)	S-5	13 / 24	8 - 10	SP		5A: Moist, medium dense, black, fine to medium SAND, some fine to coarse gravel, trace coarse sand, trace silt. (FILL) 5B: Moist, medium dense, tan, fine SAND, little fine to coarse gravel, trace coarse sand, trace silt.	A: PID = 4.8 ppm B: PID = 2.2 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
10	14.6	40 45	7-13-5-4 (18)	S-6	7 / 24	10 - 12	SW		Wet, medium dense, brown to tan, fine SAND, some medium to coarse sand, trace fine gravel, trace silt.	PID = 0.0 ppm (10'-12') Composite environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		55 X	5-4-4-5 (8)	S-7	8 / 24	12 - 14	SM		Wet, loose, brown, fine SAND, some silt, trace fine gravel.	PID = 1.3 ppm (12'-14')
15	9.6	53 113	6-3-17-31 (20)	S-8	12 / 24	14 - 16	SM		Wet, medium dense, brown to purple, fine SAND, some silt, some fine to coarse gravel.	PID = 0.2 ppm
		117 X	14-15-10-50/3"	S-9	3 / 21	16 - 17.8			Wet, medium dense, gray/purple, weathered SANDSTONE recovered as fine to coarse GRAVEL, some fine to coarse sand, little silt.	PID = 0.8 ppm

Bottom of borehole at 17.80 feet.

WATER LEVEL DATA			
	DEPTH (ft.) TO:		
DATE/TIME	BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. "X" in the casing blows column indicates that blows were not counted at that interval.

TEST BORING REPORT - GINT STD US LAB.GDT - 12/4/19 15:04 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS-090319.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
15.0																	
15.5																	
16.0										See Test Boring Report							
16.5																	
17.0																	
17.5							N/A				17.8-18.0	J	-	70	SR	SW	QZ
18.0	3.5	C-1	17.8 - 21.3	6.7 - 3.2	41 98%	17 40%			17.8	Moderately weak to strong, gray to light purple, medium SANDSTONE, massive, moderately weathered to slightly weathered.	18.0 18.2 18.2-18.4 18.4-18.5 18.6-18.8 18.8-18.9	J J ECF J J J	20 10-30 - 1-5 1-2 1-5	15 35 - 70 50 45	SR SR SR SR SM SR	SW SW MW SW SW SW	QZ Fe Fe Fe Fe Fe/SI
18.5	2.4						>10		18.6	Strong, gray to light purple, fine SANDSTONE, laminated (1-2 mm±), slightly weathered. - Bedding planes at 30°-35°.							
19.0									19.0		19.0 19.0-19.6 19.5-20.0 19.6-19.8 19.8-20.0	J J J J ECF	1-5 1-5 1-5 1-5 -	15 70 65 45 -	SR SR SR SR SR	SW SW SW SW MW/SW	Fe Fe Fe Fe Fe
19.5	2.2						>10		19.4	Moderately strong, gray to purple, fine to coarse SANDSTONE, bedded (3-4 cm±), moderately weathered to slightly weathered. - Bedding planes at 35°.							
20.0									20.0								
20.5	1.3						2				20.0 20.6-20.8	J J	- 1-5	35 40	SR SR	HW/MW SW	Fe Fe
21.0																	
21.5	3.4	C-2	21.3 - 25.8	3.2 - -1.3	29 54%	18 33%	N/A		21.3	Weak to moderately strong, gray to purple, fine SANDSTONE interlaminated with Siltstone (1-5 mm±), slightly weathered.	-	-	-	-	-	-	-
22.0	2.2						N/A			Strong, light gray to light purple, fine to medium SANDSTONE, laminated (1 mm±), slightly weathered. - Bedding planes at 35°-45°.	-	-	-	-	-	-	-
22.5																	
23.0	2.2									Lost Core. No Recovery.							
23.5							N/A		23.3	Moderately weak to strong, light gray to light purple, medium SANDSTONE, slightly weathered.	23.3-23.4 23.5 23.5-23.8 23.9-24.0	ECF J J J	- 10-40 1-35 1-10	- 40 45-80 45	SR SR SR SR	MW SW MW/SW SW	Fe Fe None None
24.0	1.9																
24.5							ECF (5±)	× × × × × ×	24.4	Moderately strong, light gray to light purple SILTSTONE, laminated (1 mm±), slightly weathered. - Minor folds from 24.4'-24.7'. - Pyrite vein near 24.4', 1 mm±.	24.0-24.1 24.1-24.3 24.4-24.7 24.5	J J ECF/S J/S	1-10 1-3 - 1-3	45 40-90 - 40	SR SR SL/SR SL/SR	SW SW MW SW	None None None None
25.0	2.2						8		24.7								
25.5							>10			Strong, light gray to light purple, fine to medium SANDSTONE, massive, moderately weathered to fresh. - Moderately strong and moderately weathered from 25.3'-25.5'. - Quartz veins from 25.6'-25.8', 1-2 mm±.	25.3 25.3-25.5 25.4-25.7 25.8-26.0	J ECF J ECF	1 - 2-10 -	35 - 50 -	SR SR SR SR	SW MW SW SW	None None None QZ
26.0	4.5	C-3	25.8 - 28.7	-1.3 - -4.2	34 97%	27 77%			25.9								
26.5							1				26.0	J	-	40	SR	F	None
27.0	3.4								26.8								
27.5							ECF (4±)			Strong, gray, coarse SANDSTONE, massive, slightly weathered to fresh. - Quartz veins throughout, 1-30 mm±.	27.1 27.3 27.3-27.4 27.4	J J ECF J	1 1-5 - 1-3	20 30 - 25	SR SR SR SR	F F SW SW	None None None None
28.0	2						7										
28.5							1			Moderately strong to strong, light gray to light purple, fine SANDSTONE, laminated (1 mm±), slightly weathered to fresh. - Bedding planes at 30°-70°.	28.0	J	1-5	25	SR	F	None
29.0	2.7	C-4	28.7 - 33.1	-4.2 - -8.6	54 100%	44 83%			28.7								
29.5	2						3			Moderately strong to strong, light gray to light purple, medium to coarse SANDSTONE, massive,	29.0-29.6 29.7 29.7-30.0	J J J	1-3 1-3 1-3	50-85 30 85	SR/R SR SR	SW SW SW	Fe/QZ None QZ
30.0																	

REMARKS:
1. Dip angles are measured from horizontal (i.e., perpendicular to core axis).
2. Prior to coring, NEBC installed the 4" casing from the ground surface to approximately 17.8'.
3. Wash color light purple.
4. After the first core run, NEBC advanced the 4" diameter casing from 17.8' to 19.0' in attempt to prevent water loss.
5. Little to no flush return from approximately 18.8'-38.3'. NEBC indicated that water was lost through the annulus between the 5" casing and 4" casing.

WATER LEVEL DATA

DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER
8/5/2019 12:15:00 PM	17.8	17.8	3.8
8/6/2019 7:00:00 AM	19.0	38.2	14.8
8/7/2019 7:00:00 AM	19.0	113.6	11.0
8/8/2019 7:00:00 AM	19.0	182.3	16.5

GROUND SURFACE EL. 24.6

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
30.0									30.1	slightly weathered to fresh.							
30.5	2						3			Strong, light gray to light purple, fine to medium SANDSTONE, massive, slightly weathered to fresh.	30.0-30.5 30.5 30.6-30.9	J J J	1-3 1-3 1-3	85 30 0-75	SR/R SM/SR R	SW SW SW	QZ Fe Fe
31.0																	
31.5	2.9						2				31.0-31.5 31.5-31.8	J J	1 1	80 65	SM/SR SM/SR	SW SW	Fe QZ/Fe
32.0																	
32.5	1/5"						0				-	-	-	-	-	-	-
33.0																	
33.5	2.7	C-5	33.1 - 38.3	-8.6 - -13.8	62 100%	58 94%	1		33.1	Strong, light gray to light green, conglomeratic SANDSTONE, massive, fresh.	33.6	J	1	40	SR	F	None
34.0																	
34.5	2.6						0				-	-	-	-	-	-	-
35.0																	
35.5	2.3						0				-	-	-	-	-	-	-
36.0																	
36.5	2.5						2		36.2	Strong, light gray to light purple, medium to coarse SANDSTONE, massive, fresh.	36.4-36.6 36.8	J J	1 1	45 30	SR SR	SW SW	QZ/CH Fe
37.0									36.6	Strong, light gray to light purple, fine to medium SANDSTONE, laminated (1 mm±), fresh. - Bedding planes at 45°.							
37.5	3.2						1				37.4	J	1-10	40	SR	F	None
38.0									37.6	Strong, light gray to light purple, coarse SANDSTONE, massive, fresh. - Quartz veins from 38.7'-39.2', 1-5 mm±.							
38.5	4.2	C-6	38.3 - 42.7	-13.8 - -18.2	55 100%	55 100%	0				-	-	-	-	-	-	-
39.0																	
39.5	3.3						1		39.3	Moderately strong to strong, light gray to light purple, fine to medium SANDSTONE, laminated (1 mm±), fresh. - Bedding planes at 30°-35°.	39.3	J	1	40	SM/SR	F	None
40.0									40.1	Strong, light gray, coarse SANDSTONE, massive, fresh. - Quartz veins, 1-7 mm±.							
40.5	3.2						0				-	-	-	-	-	-	-
41.0	3.2																
41.5							1		41.3 41.4	Strong, light purple, fine SANDSTONE, laminated (1 mm±), fresh. - Bedding planes at 35°.	41.3	J	1	40	SR	F	QZ
42.0	2.7								42.1	Strong, light gray, coarse SANDSTONE, massive, fresh. - Quartz veins from 41.4'-41.7', 1 mm±.							
42.5							2				42.3 42.8	J J	1 1-3	40 40	SM SR	SW F	None None
43.0	2.5	C-7	42.7 - 47.9	-18.2 - -23.4	60 97%	56 90%											
43.5							0			Strong, light gray to light purple, fine to medium SANDSTONE, laminated (1-2 mm±), fresh. - Bedding planes at 35°-40°.	-	-	-	-	-	-	-
44.0	2.6								44.1	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh. - Quartz veins from 44.2'-45.0', 2-10 mm±.							
44.5							1				44.0	J	1-5	40	SM	SW	QZ
45.0	2.7								45.2	Strong, light gray to light purple, fine to medium SANDSTONE, laminated (1-2 mm±), fresh. - Bedding planes at 30°.							
45.5							0				-	-	-	-	-	-	-
46.0	2								46.3								

6. Flush return blocked at approximately 33.1', the driller stopped the core run.
7. Flush returned at approximately 38.3'. Wash color light purple.
8. Wash color turned to light gray at approximately 38.5'.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
46.5							2			Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh. *(continued)*	46.0 46.3	J J	1-3 1-10	35 35	SM/SR SR	SW SW	None None
47.0	2.4																
47.5							0			- Quartz veins from 47.0'-47.3', 1 mm±.	-	-	-	-	-	-	-
48.0	2.5	C-8	47.9 - 53.1	-23.4 - -28.6	62 100%	62 100%			47.9	Moderately strong to strong, light gray, medium SANDSTONE interlaminated with fine Sandstone (1-2 mm±) to massive, fresh. - Bedding planes at 30°-40° from 47.9'-48.4'.							
48.5							1				48.3	J	1	40	SM	SW	Fe
49.0	2.8																
49.5							1			- Bedding planes at 40°-50° from 49.4'-49.9'.	49.7	J	1	25	SR	F	QZ
50.0	2.6																
50.5							1				50.1	J	1	35	SR	SW	Fe
51.0	3.5																
51.5							1				51.7	J	1	25	SR	F	None
52.0	2.6																
52.5							0				-	-	-	-	-	-	-
53.0	2.5	C-9	53.1 - 57.4	-28.6 - -32.9	51 98%	42 81%											
53.5							0			- Bedding planes at 30°-40° from 53.1'-54.3'.	-	-	-	-	-	-	-
54.0	2.7									- Pyrite pockets from 53.8'-54.2', 1-3 mm±.							
54.5							2				54.4 54.4-54.7	J J	1 1	35 50	SR SR	F F	QZ QZ
55.0	2.5								54.6	Strong to very strong, light gray, medium SANDSTONE, massive, fresh.							
55.5							0			- Pyrite pockets from 54.6'-54.8', 1 mm±. - Orthogonal joints near 54.6'.	-	-	-	-	-	-	-
56.0	3.1																
56.5							1			- Quartz veins from 55.1'-56.1', 1-5 mm±.	56.5-56.9	J	1-2	65	SR	SW	None
57.0	1.9								56.7	Moderately strong to strong, light gray, fine to medium SANDSTONE, laminated (1-3 mm±) to massive, fresh.							
57.5	3.2	C-10	57.4 - 62.5	-32.9 - -38.0	60 98%	53 87%	ECF (7±)				57.0-57.1 57.2-57.4 57.6 57.6-57.8 57.8	J ECF J ECF J	1-10 - 2-3 - 2-5	45 - 40 - 10	SR SR SR SR SR	F MW F SW F	QZ QZ None QZ None
58.0							10			- Bedding planes at 50°-60°. - Quartz veins from 57.0'-57.2', 1-7 mm±.							
58.5	2.5						0			- Bedding planes at 50°-70° from 57.8'-58.5'.	-	-	-	-	-	-	-
59.0									58.6								
59.5	3.4						2		58.9	Strong, light gray, conglomeratic SANDSTONE, massive, fresh. - Quartz veins 58.5'-58.9', 60 cm±.	59.6 59.8	J J	1-3 1-5	40 15	SR SR	F F	None None
60.0										Strong, light gray, medium to coarse SANDSTONE interlaminated with fine Sandstone and Siltstone (1-2 mm±) to massive, fresh.							
60.5	2.4						0			- Quartz veins from 59.2'-59.5', 2 mm±.	-	-	-	-	-	-	-
61.0										- Bedding planes at 40°-55° from 60.0'-60.6'.							
61.5	2.1						0			- Quartz veins from 60.8'-61.1', 1 mm±.	-	-	-	-	-	-	-
62.0																	
62.5	3.5	C-11	62.5 - 67.5	-38.0 -	61 100%	61 100%	0				-	-	-	-	-	-	-

9. Flush return blocked at approximately 57.4'. The driller stopped the core run.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
63.0				-43.0													
63.5	3.2						0			- Quartz veins from 62.5'-62.9', 2-5 mm±. - Bedding planes at 15°-30° from 62.5'-65.5'. *(continued)*	-	-	-	-	-	-	-
64.0										- Quartz vein near 63.4', 7 mm±.							
64.5	2.7						0			- Quartz vein near 64.6', 1 mm±.	-	-	-	-	-	-	-
65.0																	
65.5	3.5						0			- Quartz veins from 65.0'-65.2', 10 mm±.	-	-	-	-	-	-	-
66.0									65.5	Strong, light gray, medium SANDSTONE, massive, fresh.							
66.5	3						0			- Quartz veins from 65.8'-67.0', 1-5 mm±.	-	-	-	-	-	-	-
67.0																	
67.5	3.6	C-12	67.5 - 72.7	-43.0 - -48.2	61 98%	61 98%	0		67.5	Strong, light gray, conglomeratic SANDSTONE with Quartz, massive, fresh.	-	-	-	-	-	-	-
68.0									67.8								
68.5	4.5						0		68.5	Strong, light gray, fine to coarse SANDSTONE, massive, fresh. - Quartz marbling from 67.9'-68.2'.	-	-	-	-	-	-	-
69.0										Moderately strong to strong, light gray, conglomeratic SANDSTONE with Quartz, massive, fresh. - Quartz marbling from 68.5'-72.7'.							
69.5	7.1						1				69.1	J	1-5	10	SR	F	QZ
70.0																	
70.5	7.5						0				-	-	-	-	-	-	-
71.0																	
71.5	5.4						0				-	-	-	-	-	-	-
72.0																	
72.5	8.2						0				-	-	-	-	-	-	-
73.0		C-13	72.7 - 77.8	-48.2 - -53.3	61 100%	61 100%			72.9	Strong, light gray, medium SANDSTONE, massive, fresh.							
73.5	7.6						1		73.2	- Quartz veins near 73.1', 5-10 mm±.	73.2	J	1-10	20	SR	F	QZ
74.0										Strong to very strong, light gray to white, conglomeratic SANDSTONE with Quartz, massive, fresh. - Quartz marbling from 73.2'-74.1'.							
74.5	5.6						2				74.0-75.0 74.8	J J	1-5 1-5	80 15	SR SR	F F	QZ/PY QZ
75.0																	
75.5	4.5						0				-	-	-	-	-	-	-
76.0									75.9	Strong, light gray, coarse SANDSTONE with fine Sandstone interbeds (1-5 cm±), fresh. - Bedding planes at 30°-45°. - Quartz veins from 75.9'-77.2', 1-30 mm±.							
76.5	4.2						0				-	-	-	-	-	-	-
77.0																	
77.5	3.5						1		77.5	Strong, light gray, medium to coarse SANDSTONE, massive, fresh.	77.1	J	1-3	30	SR	F	QZ
78.0		C-14	77.8 - 82.9	-53.3 - -58.4	60 98%	60 98%											
78.5	3.3						0		78.5	Strong to very strong, light gray, fine SANDSTONE interlaminated with Siltstone (1-2 mm±) to massive, slightly weathered to fresh.	-	-	-	-	-	-	-
79.0																	

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
79.5							1			- Quartz vein near 78.5', 5 mm±.	79.5	J	1	30	SR	SW	QZ/SI
80.0	3.2									- Bedding planes at 30°-40° from 79.0'-79.6'.							
80.5							0			- Quartz veins from 79.3'-79.4', 1-7 mm±. *(continued)*	-	-	-	-	-	-	-
81.0	3.3																
81.5							0				-	-	-	-	-	-	-
82.0	3.7																
82.5							0			- Bedding planes at 30°-40° from 82.2'-84.0'.	-	-	-	-	-	-	-
83.0	3.4	C-15	82.9 - 88	-58.4 - -63.5	62 100%	62 100%											
83.5							1				83.9-84.0	J	1	45	SR	SW	QZ
84.0	4.2								84.0	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, slightly weathered to fresh.							
84.5							1			- Quartz veins from 84.1'-84.5'.	84.0-84.1	J	1	45	SR	SW	QZ
85.0	3.2									- Quartz vein near 85.0', 5 mm±.							
85.5							0		85.3	Strong, light gray, coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
86.0	3.9								85.9	- Quartz veins from 85.4'-86.0', 1-6 mm±.							
86.5							0		86.2	Strong, light gray, medium SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
87.0	3.7									Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh.							
87.5							0			- Quartz veins from 86.5'-88.8', 2-15 mm±.	-	-	-	-	-	-	-
88.0	2.8	C-16	88 - 93.2	-63.5 - -68.7	61 98%	57 92%											
88.5							2			- Quartz veins from 87.7'-88.0', 1-10 mm±.	88.1-88.3 88.4	J J	1 1	75 35	SR SR	F F	PY PY
89.0	2.7									- Quartz veins from 88.4'-88.9', 1-6 mm±.							
89.5							0				-	-	-	-	-	-	-
90.0	2																
90.5							1			- Quartz veins from 90.6'-90.7', 1-2 mm±.	90.7	J	1-5	35	SR	SW	QZ
91.0	2.9																
91.5							0		91.2	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
92.0	4.2									- Quartz veins from 91.2'-91.9', 1-2 mm±.							
92.5							1				92.7	J	1-5	40	SR	F	QZ
93.0	2.8								93.0	Strong to very strong, light gray, coarse SANDSTONE, massive, fresh.							
93.5		C-17	93.2 - 98.3	-68.7 - -73.8	62 100%	62 100%	1				93.9	J	1-5	30	SR	F	QZ
94.0									93.7	- Conglomeratic Sandstone lens from 93.1'-93.2', 1 cm±.							
94.5	3.3						1			Moderately strong to strong, light gray, conglomeratic SANDSTONE, massive, slightly weathered to fresh.	94.4	J	1-5	40	SR/R	F	QZ
95.0										- Quartz vein near 94.4', 16 mm±.							
95.5	4.1						2			- Quartz veins from 95.1'-95.5', 2-30 mm±.	95.1-95.3 95.5	J J	1-10 1-10	45 30	SR SR	F F	QZ QZ

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
96.0										- Quartz veins from 95.1'-95.5', 2-30 mm±. *(continued)*							
96.5	4.3						0				-	-	-	-	-	-	-
97.0																	
97.5	5.1						1				97.1	J	1-10	20	SR	SW	QZ
98.0																	
98.5	4.4	C-18	98.3 - 103.3	-73.8 - -78.8	60 100%	60 100%	0				-	-	-	-	-	-	-
99.0																	
99.5	5.2						0				-	-	-	-	-	-	-
100.0																	
100.5	4.9						1				100.9	J	1-5	15	SR	SW	QZ
101.0																	
101.5	4.8						0				-	-	-	-	-	-	-
102.0									101.9	Strong, light gray, medium to coarse SANDSTONE interlaminated (1-5 mm±) and interbedded (5-10 mm±) with fine Sandstone to massive, fresh.							
102.5	4.1						0				-	-	-	-	-	-	-
103.0																	
103.5	4.1	C-19	103.3 - 108.4	-78.8 - -83.9	61 100%	59 97%	0		103.3	- Bedding planes at 40°-60° from 101.9'-102.5'. - Quartz veins near 101.9', 1-3 mm±.	-	-	-	-	-	-	-
104.0										Strong to very strong, light gray, conglomeratic SANDSTONE, massive, fresh.							
104.5	4.1						1		104.3	Strong, light gray, medium SANDSTONE, massive, fresh	104.3	J	1-10	35	SR	SW	QZ
105.0									104.8	Strong to very strong, light gray, conglomeratic SANDSTONE, massive, slightly weathered to fresh.							
105.5	6						2				105.7 105.9	J J	1 1-5	20 40	SR SR	SW SW	QZ QZ
106.0									105.9	Strong to very strong, light gray, coarse SANDSTONE, massive, fresh.							
106.5	5.6						1				106.8	J	1-5	20	SR	F	QZ
107.0									106.9	Strong to very strong, light gray, conglomeratic SANDSTONE, massive, fresh.							
107.5	5.4						0				-	-	-	-	-	-	-
108.0																	
108.5	5.8	C-20	108.4 - 113.6	-83.9 - -89.1	63 100%	63 100%	0				-	-	-	-	-	-	-
109.0																	
109.5	5.8						1			- Quartz veins near 109.1', 3 mm±.	109.6	J	1	35	SR	F	QZ
110.0																	
110.5	4.3						1		110.2	Strong to very strong, light gray, medium SANDSTONE, massive, fresh.	110.6	J	1	30	SR	F	None
111.0										- Quartz veins near 110.4', 2 mm±.							
111.5	3						1				111.5	J	1-10	25	SR	F	None
112.0																	

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

(Continued Next Page)

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
112.5	5						0			- Quartz veins near 110.4', 2 mm±. *(continued)*	-	-	-	-	-	-	-
113.0																	
113.5	5.2						0			- Quartz veins near 113.3', 5 mm±.	-	-	-	-	-	-	-
114.0		C-21	113.6 - 118.6	-89.1 - -94.1	59 98%	55 92%			113.9	Strong, light gray, fine to medium SANDSTONE, laminated (1-2 mm±) to massive, fresh. - Bedding planes at 30°-40° from 113.9'-114.8'.							
114.5	3.7						1				114.1-114.3	J	1-5	45	SR	F	QZ
115.0																	
115.5	4.7						0			- Bedding planes at 40° from 115.5'-116.3'.	-	-	-	-	-	-	-
116.0																	
116.5	4.2						4		116.3	Strong, light gray, medium SANDSTONE, massive, fresh.	116.1-116.3 116.2-116.3 116.5-116.7 116.7-117.0	J J J J	1 1 1 1-5	45 45 40 75	SR SR SR SR	F F F F	QZ QZ QZ QZ
117.0																	
117.5	6.1						0			- Quartz vein near 117.2', 1 mm±.	-	-	-	-	-	-	-
118.0									117.5	Strong to very strong, light gray, conglomeratic SANDSTONE, massive, fresh.							
118.5	7.2						0			- Quartz vein near 117.7', 20 mm±. - Quartz vein near 118.3', 3 mm±.	-	-	-	-	-	-	-
119.0		C-22	118.6 - 123.6	-94.1 - -99.1	60 100%	60 100%											
119.5	5.3						0				-	-	-	-	-	-	-
120.0																	
120.5	4.6						1		120.4	- Quartz veins from 120.0'-120.4', 1-10 mm±. Strong, light gray, fine to medium SANDSTONE, laminated (1-5 mm±), fresh.	120.2	J	1-20	35	SR	F	QZ
121.0																	
121.5	5.6						1		121.1	- Bedding planes at 25°-35°. Strong, light gray, conglomeratic SANDSTONE, massive, fresh. - Quartz veins from 121.1'-121.6', 5-12 mm±.	121.1	J	1	30	SR	F	QZ
122.0																	
122.5	5.3						0				-	-	-	-	-	-	-
123.0																	
123.5	6.7						0				-	-	-	-	-	-	-
124.0		C-23	123.6 - 128.6	-99.1 - -104.1	60 100%	60 100%											
124.5	4.5						1		124.2	Strong, light gray, medium SANDSTONE, laminated (1 mm±), fresh.	124.9	J	1	30	SR	F	QZ
125.0									125.0	- Bedding planes at 40°. - Quartz vein near 124.9', 25 mm±.							
125.5	3.1						0			Strong, light gray, medium SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
126.0																	
126.5	3.2						0				-	-	-	-	-	-	-
127.0										- Quartz veins from 126.8'-127.3', 2-10 mm±.							
127.5	5.2						1				127.6	J	1	30	SR	F	Fe
128.0																	
128.5	4						0		128.4	- Quartz veins from 128.0'-128.2', 2 mm±.	-	-	-	-	-	-	-
		C-24	128.6	-104.1	43	40			128.6	Strong, light gray, conglomeratic							

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
129.0			- 132.4	- -107.9	93%	87%				SANDSTONE, massive, fresh.							
129.5	5						0		129.2	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh. *(continued)*	-	-	-	-	-	-	-
130.0									130.0	Strong to very strong, light gray, conglomeratic SANDSTONE, massive, fresh.							
130.5	4.1						0				-	-	-	-	-	-	-
131.0									130.9	Strong, light gray, medium to coarse SANDSTONE, massive, fresh.							
131.5	4.6						2			Strong, light gray, medium SANDSTONE interlaminated with fine Sandstone (1-2 mm±), slightly weathered to fresh. - Bedding planes at 40°-50°.	131.5-131.7 131.8-132.0	J J	1 1	50 50	SM SM	F SW	QZ/PY None
132.0																	
132.5	4.4	C-25	132.4 - 137.5	-107.9 - -113.0	61 100%	57 93%	0		132.4	Strong, light gray, conglomeratic SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
133.0																	
133.5	4.4						1				133.0	J	1	40	SR	F	QZ
134.0										- Quartz vein near 134.0', 6 mm±.							
134.5	5.4						0				-	-	-	-	-	-	-
135.0										Strong, light gray, medium SANDSTONE, massive, fresh.							
135.5	5.1						1				135.9	J	1-10	10	SR	F	QZ
136.0										- Quartz veins from 135.7'-136.0', 10-17 mm±.							
136.5	5.2						1		136.3	- Quartz veins near 136.2', 2-7 mm±. Strong, light gray, coarse SANDSTONE, massive, fresh.	136.3	J	1-5	35	SR	F	QZ
137.0																	
137.5	6.1	C-26	137.5 - 142.8	-113.0 - -118.3	63 98%	63 98%	1				137.0-137.2	J	1-5	45	SR	F	QZ
138.0																	
138.5	5.6						1				138.3	J	1-10	20	SR	F	QZ
139.0																	
139.5	6.6						0				-	-	-	-	-	-	-
140.0									139.9	Strong, light gray, conglomeratic SANDSTONE, massive, fresh.							
140.5	8.4						1				140.0	J	1	30	SR	F	QZ
141.0																	
141.5	6.8						0				-	-	-	-	-	-	-
142.0																	
142.5	6.3						0				-	-	-	-	-	-	-
143.0		C-27	142.8 - 147.6	-118.3 - -123.1	54 93%	54 93%											
143.5	3.9						0		143.3	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
144.0																	
144.5	3.2						1			- Quartz marbling from 144.8'-145.4'.	144.8-145.0	J	1-10	30	SR	F	QZ
145.0																	

10. Flush return blocked at approximately 132.4'. The driller stopped the core run.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
145.5	2						1		145.4	Strong to very strong, light gray, conglomeratic SANDSTONE, massive, fresh.	145.1-145.3	J	1-5	45	SR	F	QZ
146.0																	
146.5	2.1						0		146.6	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh. - Quartz veins near 147.2', 13 mm±.	-	-	-	-	-	-	-
147.0																	
147.5	3.5	C-28	147.6 - 152.6	-123.1 - -128.1	62 100%	62 100%	1				147.1-147.3	J	1-10	45	SR	F	QZ
148.0																	
148.5	3.5						1				148.7	J	1-5	40	SR	F	QZ
149.0																	
149.5	3.2						1		149.7	Strong, light gray, conglomeratic SANDSTONE, massive, fresh.	149.7	J	1-5	35	SR	F	QZ
150.0									150.3	Strong to very strong, light gray, medium to coarse SANDSTONE, massive, fresh.							
150.5	4						1				150.3-150.6	J	1-5	45	SR	F	QZ
151.0									151.1	Strong, light gray, conglomeratic SANDSTONE, massive, fresh.							
151.5	4.3						0				-	-	-	-	-	-	-
152.0																	
152.5	5.3						0				-	-	-	-	-	-	-
153.0		C-29	152.6 - 157.9	-128.1 - -133.4	62 97%	62 97%											
153.5	3.8						1				153.2-153.9	J	1-5	75	SR	F	PY/QZ
154.0																	
154.5	4.5						1				154.5	J	1	35	SR	F	QZ
155.0																	
155.5	4.2						1		155.7	Strong to very strong, light gray, medium SANDSTONE, massive, fresh.	155.2-155.4	J	1	35	SR	F	None
156.0																	
156.5	5						0				-	-	-	-	-	-	-
157.0																	
157.5	4.5						0				-	-	-	-	-	-	-
158.0		C-30	157.9 - 162.9	-133.4 - -138.4	62 100%	62 100%											
158.5	4.5						0				-	-	-	-	-	-	-
159.0																	
159.5	3.8						0				-	-	-	-	-	-	-
160.0																	
160.5	3.9						1		160.5	Strong, light gray, fine SANDSTONE interlaminated with Siltstone (1-2 mm±), slightly weathered to fresh. - Bedding planes at 40°-50°.	160.0	J	1	35	SR	F	None
161.0																	
161.5							1				161.7	J	1	35	SR	SW	None

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

(Continued Next Page)

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
162.0	4.6																
162.5							0		162.4	Strong, light gray, medium to coarse SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
163.0	3.4	C-31	162.9 - 168.1	-138.4 - -143.6	61 98%	57 92%											
163.5							0				-	-	-	-	-	-	-
164.0	3.5																
164.5							2				164.4 164.7	J J	1-15 1	30 35	SR SR	F F	QZ None
165.0	3.1																
165.5							0				-	-	-	-	-	-	-
166.0	3.4																
166.5							3				166.3 166.4 166.9	J J J	1 1 1	15 25 30	SR SR SR	F F F	None None None
167.0	3.7																
167.5							0				-	-	-	-	-	-	-
168.0	3.7																
168.5		C-32	168.1 - 172.3	-143.6 - -147.8	50 100%	47 94%	1		168.4	Strong, light gray, fine to medium SANDSTONE interlaminated with Siltstone (1-2 mm±) to massive, slightly weathered to fresh. - Bedding planes at 30°-40° from 168.4'-169.7'.	168.4	J	1-10	20	SR	F	QZ
169.0	4.2																
169.5							1				169.6	J	1-5	30	SR	F	QZ/PY
170.0	3.5																
170.5							0				-	-	-	-	-	-	-
171.0	3.5																
171.5	1.4/3"						0			- Bedding planes at 30°-40° from 171.1'-173.7'.	-	-	-	-	-	-	-
172.0																	
172.5	4	C-33	172.3 - 177.3	-147.8 - -152.8	60 100%	55 92%	0				-	-	-	-	-	-	-
173.0																	
173.5	2.7						2				173.6 173.7-174.0	J J	1 1	30 50	SR SR	F F	None QZ
174.0										- Orthogonal joints near 173.7'.							
174.5	3.4						2				174.0-174.4 174.7	J J	1 1	50 20	SR SR	F F	QZ PY/QZ
175.0										- Quartz veins from 174.8'-175.9', 1-10 mm±.							
175.5	3.1						1			- Bedding planes at 40°-50° from 175.2'-176.9'.	175.8-176.0	J	1	40	SR	F	QZ
176.0																	
176.5	2.5						2				176.1 176.9	J J	1 1	30 30	SR SR	F F	PY None
177.0									176.9	Strong, light gray, fine to medium SANDSTONE interlaminated with Siltstone and Graphite (1-2 mm±), slightly weathered to fresh. - Bedding planes at 30°-45°.							
177.5	4	C-34	177.3 - 182.3	-152.8 - -157.8	60 100%	59 98%	1				177.0	J	1	30	SM	SW	None
178.0																	

11. Flush return blocked at approximately 172.3'. The driller stopped the core run.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
178.5	2.5						0			- Quartz veins near 177.7', 1-5 mm±. - Quartz veins near 178.1', 1 mm±. *(continued)*	-	-	-	-	-	-	-
179.0										- Quartz veins near 178.3', 1 mm±.							
179.5	2.6						0		179.2	Strong to very strong, light gray, conglomeratic SANDSTONE, massive, slightly weathered to fresh.	-	-	-	-	-	-	-
180.0										- Quartz veins from 179.6'-181.2', 1-3 mm±.							
180.5	2.6						0				-	-	-	-	-	-	-
181.0																	
181.5	4.5						2				181.2-181.5 181.3	J J	1-5 1-5	55 30	SR SR	SW SW	QZ QZ
182.0																	
182.5	3.5	C-35	182.3 - 187.3	-157.8 - -162.8	61 100%	58 97%	0				-	-	-	-	-	-	-
183.0																	
183.5	3						3			- Quartz veins from 183.4-'186.5', 1-10 mm±.	183.3-183.7 183.6 183.8	J J J	1-5 1 1-5	55 30 40	SR SR SR	SW SW SW	QZ QZ QZ
184.0																	
184.5	3.7						1				184.3	J	1-10	35	SR	SW	QZ
185.0																	
185.5	3.6						0				-	-	-	-	-	-	-
186.0																	
186.5	3.3						1				186.0-186.2	J	1-10	60	SR	SW	QZ
187.0																	
187.5	4.3	C-36	187.3 - 189.7	-162.8 - -165.2	28 96.5%	25 86%	2				187.0-187.1 187.9	J J/S	1-5 1	40 30	SR SL/SM	SW SW	QZ QZ
188.0																	
188.5	4						1				188.8-189.0	J/S	1	45	SL/SM	MW/SW	QZ/SA
189.0	2.3/5"								188.9	Moderately strong to strong, light gray, fine SANDSTONE, laminated (1 mm±), slightly weathered to fresh. - Bedding planes at 40°. - Quartz veins, 1-5 mm±.							
189.5							1				189.1-189.3	J	1	45	SR	SW	QZ
190.0	4.2	C-37	189.7 - 193.6	-165.2 - -169.1	47 100%	32 68%											
190.5	4.7						0		190.2	Strong, light gray, medium to coarse SANDSTONE interlaminated with Graphite (1 mm±), slightly weathered to fresh. - Bedding planes at 50°-60°. - Quartz veins, 1-20 mm±.	-	-	-	-	-	-	-
191.0																	
191.5	3.9						4				191.1-191.4 191.3-191.5 191.5-191.7 191.7-192.0	J/S J J/S J	1-10 1-10 1-5 1-5	55 45 45 50	SL/SR SR SR SR	SW SW SW SW	QZ QZ QZ QZ
192.0									191.6	Strong, gray, fine to medium SANDSTONE interlaminated with Graphite (1-2 mm±), slightly weathered to fresh. - Bedding planes at 30°-45°.							
192.5	4.2						4				192.0-192.2 192.0-192.3 192.5 192.8	J J J J	1-5 1-10 1-5 1	50 50 30 40	SR SR SR SR	SW SW F F	QZ QZ QZ QZ
193.0																	
193.5	4.5						3			- Quartz veins from 193.6'-194.0', 1-6 mm±.	193.1 193.6-193.7 193.7	J J J	1-4 1-2 1	25 50 30	SR SR SR	SW F F	None QZ QZ
194.0		C-38	193.6 - 196.7	-169.1 - -172.2	36 97%	35 94.5%											
194.5							0				-	-	-	-	-	-	-

12. Flush return blocked at approximately 189.7', the driller stopped the core run.
13. Flush return blocked at approximately 193.6', the driller stopped the core run.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
195.0	4.1								194.8	Strong, light gray, medium SANDSTONE, massive, fresh. - Quartz veins from 194.8'-195.9', 1-7 mm±.							
195.5	4						0				-	-	-	-	-	-	-
196.0																	
196.5							1				196.8	J	1-20	20	SR	SW/F	QZ
197.0	4.1	C-39	196.7 - 201.3	-172.2 - -176.8	47 85%	33 60%			196.7	Strong, gray, fine SANDSTONE interlaminated with Graphite (1-2 mm±), slightly weathered to fresh. - Bedding planes at 20°-30°. - Quartz veins from 196.7'-199.3', 1-5 mm±.							
197.5	2.5						0				-	-	-	-	-	-	-
198.0																	
198.5	2.5						2				198.3 198.6	J J	1-20 1-5	20 25	SR SR	F SW	QZ QZ
199.0																	
199.5	4						2				199.6 199.6-200.0	J J	1-25 1-5	20 75	SR SR	MW/SW F	SA/SI QZ
200.0																	
200.5	2.2						ECF (7±)			- Moderately strong and moderately to slightly weathered from 200.3'-200.8'.	200.0 200.0-200.2 200.2-200.3 200.3-200.8	J J J ECF	1 1 1 -	10 80 50 -	SR SR SR SR	F SW SW MW/SW	QZ QZ QZ QZ
201.0							10		200.8	Lost Core. No Recovery.							
201.5	4.5	C-40	201.3 - 204.6	-176.8 - -180.1	39 98%	36 90%	1		201.3	Strong, gray, fine SANDSTONE interlaminated with Graphite (1 mm±), slightly weathered to fresh. - Bedding planes at 30°-35°. - Quartz veins from 201.3'-204.0', 1-5 mm±.	201.3-201.5	J	2-5	60	SR	SW	QZ
202.0	3.7																
202.5							2				202.1 202.5-202.7	J J	1 1	35 45	SR SR/R	SW SW	QZ QZ/SA
203.0	3.3																
203.5							0		203.3	Strong, gray, fine to medium SANDSTONE, massive, slightly weathered to fresh.	-	-	-	-	-	-	-
204.0	1.6/4"																
204.5	4.4						2			- Slightly weathered from 204.4'-204.5'.	204.4 204.5	J J	1-5 1-5	30 30	SR SR	SW SW	None None
205.0		C-41	204.6 - 208.6	-180.1 - -184.1	47 98%	31 65%			204.6	Strong, gray, fine SANDSTONE interlaminated with Siltstone and Graphite (1 mm±), fresh. - Bedding planes at - Quartz veins from 204.6'-205.0', 1-5 mm±.							
205.5	3.3						0				-	-	-	-	-	-	-
206.0											206.0	J	1	35	SR	SW	QZ
206.5	4.2						ECF (4±)		206.3	- Quartz veins from 206.0'-206.2', 5-10 mm±.	206.2 206.3 206.5-206.8 206.7-206.9 206.7-207.0 206.8-207.0	J J J ECF J J	1 1 1-10 - 2-5 1-10	30 30 55 - 50 55	SR SR SR SM/SR SR SR	SW SW SW MW/SW SW SW	QZ QZ PY QZ/SI QZ QZ
207.0							10			Strong, gray SILTSTONE interlaminated with Graphite (1 mm±), moderately weathered to fresh. - Bedding planes at 30°-35°.							
207.5	3.9						1				207.9	J	1	30	SR	SW	None
208.0																	
208.5	4.5						3			- Moderately to slightly weathered from 206.7'-206.9'.' - Moderately strong from 206.7'-206.9'.	208.1 208.5 208.6	J J J	1-10 1 1	15 15 10	SR SR SR	SW SW SW	QZ None None
209.0		C-42	208.6 - 213.4	-184.1 - -188.9	60 100%	60 100%											
209.5	3.5						0				-	-	-	-	-	-	-
210.0																	
210.5	3.7						0			- Quartz veins from 210.2'-211.1', 1-10 mm±.	-	-	-	-	-	-	-
211.0																	

14. Flush return blocked at approximately 196.7', the driller stopped the core run.
15. Flush return blocked at approximately 201.3', the driller stopped the core run.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
211.5	3.2						0		211.1	Moderately strong to strong, gray, fine to medium SANDSTONE interlaminated with Siltstone and Graphite (1-2 mm±), slightly weathered to fresh. - Bedding planes at 30°-40°. - Siltstone interlaminations from 211.1'-214.0'. *(continued)*	-	-	-	-	-	-	-
212.0																	
212.5	2.6						1				213.9	J	1	40	SR	F	QZ
213.0																	
213.5	3.2	C-43	213.4 - 218.7	-188.9 - -194.2	63 98%	55 86%	0			- Quartz veins from 213.7'-215.6', 1-15 mm±.	-	-	-	-	-	-	-
214.0																	
214.5	3.5						0			- Graphite interlaminations from 214.2'-217.8'.	-	-	-	-	-	-	-
215.0																	
215.5	3.5						0				-	-	-	-	-	-	-
216.0																	
216.5	3.6						2			- Quartz veins from 216.4'-218.0', 1-10 mm±.	217.8 217.9	J J	1-10 1	30 40	SM SR	SW SW	QZ QZ
217.0																	
217.5	3.3						ECF (4±)				218.1 218.1-218.2 218.2-218.4 218.5	J ECF J J	1-20 - 1-5 1-20	30 - 55 15	SR SR SR SR	F SW F F	None QZ QZ QZ
218.0							7				219.0	J	1	15	SR	SW	None
218.5	3.7						>10		218.2	- Moderately strong from 218.1'-218.2'.	219.0-219.2 219.1-219.3 219.3 219.6 219.7 219.8	J ECF J J J J	1 - 5-50 1-10 1-5 2-20	35 - 10 20 15 5	SR SR SR SR SR SR	SW HW/MW MW MW/SW SW SW	None QZ None QZ None QZ
219.0		C-44	218.7 - 221.8	-194.2 - -197.3	18 49%	4 11%			218.9	Strong, gray, fine to coarse SANDSTONE, massive, slightly weathered to fresh. - Quartz veins, 1 mm±.	219.8-220.0	ECF	-	-	SR	HW/MW	QZ
219.5	3.8						N/A		219.2	Strong, gray, conglomeratic SANDSTONE, massive, slightly weathered.	220.0-220.1 220.1	ECF J	- 2-10	- 35	SR SR	HW/MW SW	QZ QZ
220.0																	
220.5	4.5						N/A		220.2	Very weak to moderately strong, dark gray, fine SANDSTONE interlaminated with Graphite and Siltstone (1 mm±), highly weathered to slightly weathered. - Bedding planes at 0°-20°. - Very weak from 219.2'-219.3' and 219.8'-220.1'. - Highly to moderately weathered from 219.2'-219.3' and 219.8'-220.1'. Lost Core. No Recovery.	-	-	-	-	-	-	-
221.0																	
221.5	4						0				-	-	-	-	-	-	-
222.0		C-45	221.8 - 223.7	-197.3 - -199.2	23 100%	18 78%			221.8								
222.5	3.2						3				223.2-223.4 223.5-223.7 223.8	J J J	1 1-30 1-5	40 40 25	SR SR SR	SW SW F	QZ QZ QZ
223.0																	
223.5	3.1						0			Strong, gray, conglomeratic SANDSTONE, massive, slightly weathered to fresh. - Quartz veins from 222.5'-223.2', 1-40 mm±.	-	-	-	-	-	-	-
224.0		C-46	223.7 - 228.8	-199.2 - -204.3	58 95%	54 88.5%											
224.5	3.1						0			- Quartz veins from 223.7'-225.3', 1-15 mm±.	-	-	-	-	-	-	-
225.0																	
225.5	3.2						0		225.3	Strong, light gray, medium SANDSTONE, massive, fresh.	-	-	-	-	-	-	-
226.0																	
226.5	3						0		226.7		-	-	-	-	-	-	-
227.0																	
227.5							2				228.0	J	1-5	15	SR	SW	QZ

16. No recovery between the depths of 220.0'-221.8'. The driller performed shorter core runs in attempt to improve core recovery.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-39

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS
228.0	3.6									Strong, gray, conglomeratic SANDSTONE, slightly weathered to fresh.
228.5							0		228.1	- Quartz veins from 226.7'-227.8', 1-7 mm±. *(continued)*
229.0	3.3	C-47	228.8 - 233.7	-204.3 - -209.2	59 100%	59 100%				- Quartz vein from 228.0'-228.1', 20-25 mm±.
229.5							0			Moderately strong to strong, gray, fine SANDSTONE interlaminated with Graphite (1-5 mm±), slightly weathered to fresh.
230.0	3.1									- Bedding planes at 30°-40°.
230.5							0			- Quartz veins from 228.9'-231.1', 1-20 mm±.
231.0	3									- Moderately weathered from 229.2'-229.3', near 229.6' and from 230.6'-231.0'.
231.5							0		231.3	- Moderately weathered near 229.6'.
232.0	2.4									- Moderately strong near 229.6'.
232.5							0			- Moderately weathered from 230.6'-231.0'.
233.0	2.5									- Moderately strong from 230.6'-231.0'.
233.5										Strong, gray, medium SANDSTONE interlaminated with Siltstone (1-2 mm±) to massive, fresh.
234.0										- Quartz veins from 231.9'-233.5', 1-10 mm±.
234.5										- Bedding planes at 30°-40° from 232.3'-233.7'.
235.0										**Bottom of borehole at 233.7 feet.**
235.5										
236.0										
236.5										
237.0										
237.5										
238.0										
238.5										
239.0										
239.5										
240.0										
240.5										
241.0										
241.5										
242.0										
242.5										
243.0										
243.5										
244.0										

DISCONTINUITIES

Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
228.2	J	1-5	40	SM	SW	QZ
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

CORE BORING REPORT - CORE BORING REPORT.GDT - 12/4/19 14:59 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-40

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 5/11/2018
FINISH 5/11/2018
DRILLER NEBC
LOGGED BY HMS
CHECKED BY SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	5	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile B-53
Bit Type: 4 7/8" Tricone
Drill Fluid: Water
Casing: 5"
Hoist/Hammer: Automatic Hammer

ELEVATION 33.3
DATUM NGVD 1929
NORTHING 289232.91
EASTING 359692.649
LOCATION Main Street at Roosevelt

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	33.3								6" Pavement	
		X	43-12-11-7 (23)	S-1	4 / 24	0.5 - 2.5	SM		Moist, medium dense, fine to coarse SAND, some fine gravel, little silt, trace coarse gravel.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	10-9-10-10 (19)	S-2	10 / 24	2.5 - 4.5	SW		Moist, medium dense, brown, fine to coarse SAND and fine to coarse GRAVEL, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	9-8-29 (37)	S-3	17 / 18	4.5 - 6	SW		Moist, dense, brown, fine to coarse SAND, some fine to coarse gravel, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
5	28.3									
		X	33-21-44-31 (65)	S-4	16 / 24	6 - 8	GW-GM		Moist, very dense, brown, fine to coarse GRAVEL, some fine to coarse sand, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	31-17-18-10 (35)	S-5	15 / 24	8 - 10	GW-GM		Moist/wet, dense, brown, fine to coarse GRAVEL, some fine to coarse sand, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.Water level at approximately 9.5'.
10	23.3									
		X	13-17-14-13 (31)	S-6	10 / 24	10 - 12	GW		Wet, dense, brown, coarse GRAVEL, some fine to coarse sand, little fine gravel, trace silt.	PID = 0.0 ppm
		X								
		X	6-5-17-48 (22)	S-7	9 / 24	12 - 14	SM		Wet, medium dense, brown, fine to coarse SAND, some fine gravel, little silt, trace coarse gravel.	PID = 0.0 ppm
			105	S-8	4 / 8	14 - 14.2			Wet, very dense, gray, weathered SANDSTONE recovered as fine to coarse gravel, little fine to coarse sand, trace silt.	Obstruction/possible Bedrock at 14'.

Bottom of borehole at 14.20 feet.

WATER LEVEL DATA			
	DEPTH (ft.) TO:		
DATE/TIME	BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. "X" within casing blows indicates blows were not counted at that interval.

TEST BORING REPORT - GINT STD US LAB.GDT - 8/6/19 11:11 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-40

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS
10.0										
10.5										
11.0										
11.5										
12.0										
12.5										
13.0										
13.5										
14.0										
14.5									14.2	Weathered Rock - No Sample Taken
15.0	3	C-1	14.6 - 17.4	18.7 - 15.9	34 100%	26.5 78%			14.6	Strong, gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 16.7', 15 mm±. - 'Vuggy'1-3 mm ± diameter at 16.6'-16.7'.
15.5	4						2			
16.0										
16.5	3.25						2			
17.0									16.7	Strong, gray, fine to coarse SANDSTONE, bedded 10-20 mm± to massive, fresh. - Bedding planes at 30°-40°. - Quartz vein at 18.1', 15 mm±.
17.5	5.5	C-2	17.4 - 20.6	15.9 - 12.7	38 100%	23 61%	3			
18.0										
18.5	3						1			
19.0										
19.5	2.75						4			
20.0										
20.5										
21.0										**Bottom of borehole at 20.6 feet.**
21.5										
22.0										
22.5										
23.0										
23.5										
24.0										
24.5										
25.0										

DISCONTINUITIES

Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
15.4	J	1	30	R	F	None
15.7	J	1	50	R	SW	Fe
16.5	J	1-10	60	SR	SW	Fe
16.9	J	1	30	SR	SW	Fe
17.2	B	1	30	SR	SW	Fe/QZ
17.6	J	5	40	VR	F	None
17.9	B	1	30	R	F	QZ
18.5	B	1	30	SR	F	None
19.2	B	1	30	SR	SW	Fe
19.3	J	10	25	R	SW/RS	Sl
19.7	J	1	25	R	SW	Fe
19.9	B	1	30	SR	SW	Fe

REMARKS:
1. Dip angles are measured from horizontal (i.e., perpendicular to the core axis).
2. Flush return blocked at ~17.6'. Driller moved casing up and down to unblock.
3. Boring was backfilled with cement bentonite grout from 20.6 feet to the ground surface. No groundwater monitoring well was installed.

WATER LEVEL DATA

DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER

GROUND SURFACE EL. 33.3

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

CORE BORING REPORT - CORE BORING REPORT.GDT - 8/6/19 11:27 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-41

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 5/3/2018
FINISH 5/4/2018
DRILLER NEBC
LOGGED BY HMS
CHECKED BY SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	4	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile B-53
Bit Type: 3 7/8" Tricone
Drill Fluid: Water
Casing: 4"
Hoist/Hammer: Automatic Hammer

ELEVATION 12.8
DATUM NGVD 1929
NORTHING 287414.433
EASTING 359504.663
LOCATION Taft Street near Division Street Bridge

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	12.8									
		X							Approximately 9" Pavement.	9" PAVEMENT
		10	9-10-12-72 (22)	S-1	15 / 24	0.75 - 2.75	SW-SM		A: Wet, medium dense, brown, fine to coarse SAND and fine to coarse GRAVEL, little silt. B: Wet, very dense, purple/brown, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	1A: PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs. 1B: PID = 0.0 ppm
		18								
			146	S-2	0 / 6	2.75 - 3.25			No Recovery.	
		97								
5	7.8	X	28-9-7-3 (16)	S-3	8 / 24	4 - 6	GW		Wet, medium dense, purple/brown, fine to coarse GRAVEL, some fine to coarse sand, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	3-3-4-7 (7)	S-4	5 / 24	6 - 8	GW		Wet, loose, brown, coarse GRAVEL, some fine gravel, little fine to coarse sand, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	3-2-7-17 (9)	S-5	5 / 24	8 - 10	SW-SM		Wet, loose, brown, fine to coarse SAND and fine coarse GRAVEL, little silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
10	2.8	X								
		X	6-3-8-19 (11)	S-6	3 / 24	10 - 12	GW		Wet, medium dense, brown, coarse GRAVEL, little fine to coarse sand, trace silt, trace fine gravel.	PID = 0.0 ppm
		X								
		X	14-10-16-18 (26)	S-7	13 / 24	12 - 14	GW-GM		Wet, medium dense, brown, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	PID = 0.0 ppm
		X								
15	-2.2	X	22-23-33-39 (56)	S-8	11 / 24	14 - 16	GW		Wet, very dense, tan/gray, fine to coarse GRAVEL, little fine to coarse sand, trace silt, trace clay. (Possible weathered Sandstone)	PID = 0.0 ppm
		X								
			27-56-87-51 (143)	S-9	19 / 24	16 - 18	SW		A: Wet, very dense, gray, fine to coarse SAND, some fine gravel, trace silt, trace coarse gravel. B: Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND, little silt. (Possible weathered Sandstone)	PID = 0.0 ppm
			103/4"	S-10	2 / 4	18 - 18.3			Wet, very dense, gray, weathered SANDSTONE recovered as fine to coarse gravel, trace fine to coarse sand, trace silt.	PID = 0.0 ppm

Bottom of borehole at 18.30 feet.

WATER LEVEL DATA			
	DEPTH (ft.) TO:		
DATE/TIME	BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. No casing blows for the first foot. NEBC set and reset casing to make sure casing was plum.
2. Used 140 lb. hammer for casing blows from 2'-4'.
3. Starting at 4', NEBC used the kelly and weight of the drilling to advance casing.
4. NEBC determined weathered bedrock began at approximately 18.3'. NEBC advanced roller bit to competent rock at approximately 21.1'.
5. "X" within casing blows indicates blows were not counted at that interval.

TEST BORING REPORT - GINT STD US LAB.GDT - 8/6/19 11:11 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-41

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
15.0																	
15.5																	
16.0																	
16.5																	
17.0																	
17.5																	
18.0																	
18.5										Weathered Rock - No Sample Taken							
19.0																	
19.5																	
20.0																	
20.5																	
21.0																	
21.5	2.5	C-1	21.1 - 25	-8.3 - -12.2	47 100%	37 79%	1		21.1	Strong, gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 21.5', 5 mm±. - Quartz vein at 22.1', 3 mm±. - Quartz vein at 22.2', 2 mm±.	21.3	J	1	45	SR	F	None
22.0	4.75										22.0	J	1	55	R	SW	Fe
22.5							3				22.5	J	1	45	SM	F	None
23.0	2.5										22.7	J	1	45	SM	F	None
23.5	2.75						1		23.0	Strong, gray/blue, fine to coarse SANDSTONE interlaminated with Siltstone, fresh. - Bedding planes at 40°-50°.	23.3	B	1	45	SM	F	None
24.0																	
24.5	1.5						ECF (4±)				24.0	B	1	45	SR	F	None
											24.2	B	1	40	SM	SW	Fe
											24.7	B	1	45	SR	SW	Sl
											24.8-24.9	ECF	-	-	SR	SW	Fe
25.0							7										
25.5										**Bottom of borehole at 25.0 feet.**							
26.0																	
26.5																	
27.0																	
27.5																	
28.0																	
28.5																	
29.0																	
29.5																	
30.0																	

REMARKS:
1. Dip angles are measured from horizontal (i.e., perpendicular to the core axis).
2. Wash color white.
3. Flush return blocked at approximately 22.8'. Driller moved casing up and down to unblock.
4. Boring was backfilled with cement bentonite grout from 25.0 feet to the ground surface. No groundwater monitoring well was installed.

WATER LEVEL DATA

DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER

GROUND SURFACE EL. 12.8

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

CORE BORING REPORT - CORE BORING REPORT.GDT - 8/6/19 11:27 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-45

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 4/2/2019
FINISH 4/2/2019
DRILLER NEBC
LOGGED BY JPN
CHECKED BY RKM/SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	NX
Inside Diameter (in.)	4	1 3/8	1 7/8
Hammer Weight (lb.)	300	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Diedrich D-120
Bit Type: 3 7/8" Tricone
Drill Fluid: Water
Casing: 4"
Hoist/Hammer: Automatic/Safety Hammer

ELEVATION 28.4 **NORTHING** 288479.475
DATUM NGVD 1929 **EASTING** 359446.389
LOCATION Jenks Way

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	28.4								
		X						9" Asphalt.	9" ASPHALT
		35	16-11-6/3"	S-1	10 / 15	0.75 - 2	SW	Moist, medium dense, brown, fine to coarse SAND, trace fine gravel, trace silt. (FILL)	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		25	10-21-11-6 (32)	S-2	13.5 / 24	2 - 4	SP-SM	Moist, dense, brown, fine to medium SAND, little coarse sand, little silt, little fine gravel. (FILL)	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		31							
5	23.4	20	5-5-3-5 (8)	S-3	4 / 24	4 - 6	SW-SM	Wet, loose, brown, fine to coarse SAND, some silt, little fine gravel. (FILL)	PID = 0 ppm (4'-6') Driller pushed sample 1'±. Composite environmental sample taken (4'-8'). (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		11							
		11	20-10-5-3 (15)	S-4	5 / 24	6 - 8	SP-SM	Wet, medium dense, brown to gray, fine SAND and SILT, trace medium to coarse sand, little fine to coarse gravel. (FILL)	PID = 0.3 ppm (6'-8') Casing sunk with spoon blows.
		X							
		100	2-3-4-2 (7)	S-5	9 / 24	8 - 10	SW-SM	Wet, loose, brown to gray, fine to coarse SAND, little silt, some fine to coarse gravel, trace glass. (FILL)	PID = 0 ppm (8'-10') Composite environmental sample taken (8'-12'). (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		4							
10	18.4	7	3-2-6-40 (8)	S-6	7 / 24	10 - 12	GP	Wet, loose, brown to gray, fine to coarse GRAVEL and fine to coarse SAND, trace ceramic, trace silt. (FILL)	PID = 0 ppm (10'-12')
		11							
		X	14-11-7-7 (18)	S-7	12 / 24	12 - 14	GW-GM	Wet, medium dense, brown to gray, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		X							
15	13.4	11	0-2-3-9 (5)	S-8	9 / 24	14 - 16	SW-SM	Wet, loose, brown to gray SAND, some silt, little fine to coarse gravel.	PID = 0 ppm
		80							
		95	6-6-7-4 (13)	S-9	16 / 24	16 - 18	SP-SM SP	9A: Bottom 8": Wet, medium dense, brown, fine to coarse SAND, little silt, trace fine to coarse gravel. 9B: Top 8": Wet, medium dense, brown to gray, fine to coarse SAND, some silt, some fine to coarse gravel.	PID = 0 ppm
		83							
		108	23-35-28-18 (63)	S-10	12 / 24	18 - 20	GW-GM	Moist, very dense, brown to gray, fine to coarse GRAVEL, some fine to coarse sand, little silt.	PID = 0 ppm
20	8.4	70							
		70	22-21-18-17 (39)	S-11	19 / 24	20 - 22	SW-SM	11A: Top 7": Wet, dense, brown to gray, fine to coarse SAND, little fine to coarse gravel, trace silt. 11B: Bottom 12": Wet, dense, brown to gray, fine to coarse SAND, some silt, little fine to coarse gravel.	PID = 0 ppm
		84							
		96	25-49-79-105 (128)	S-12	24 / 24	22 - 24	SM	Wet, very dense, reddish brown/gray, fine to coarse SAND, some fine gravel, little silt.	PID = 0 ppm
		99							
25	3.4	76	60-57-		15	24		Wet, very dense, reddish brown/gray, fine to coarse SAND and SILT, little fine to coarse gravel.	

WATER LEVEL DATA

DATE/TIME	DEPTH (ft.) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. Boring was backfilled with cement bentonite grout from the bottom of the borehole to a depth of 4'. The borehole was backfilled to the surface with 3 bags of bentonite chips, one 50 lb. bag of dry concrete mix, and 10"± of asphalt patch.

(Continued Next Page)

TEST BORING REPORT - GINT STD US LAB.GDT - 8/22/19 08:36 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-45

TEST BORING REPORT

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
25	3.4									
		136	44-36 (101)	S-13	/ 24	- 26	SM			PID = 0 ppm
			200/1"	S-14	4 / 1	26 - 26.1	SW-SM		Wet, very dense, gray to brown, medium to coarse SAND, some silt, little fine sand, trace fine gravel.	PID = 0 ppm
				S-15	/	26.1 - 28.3			Rollerbit refusal.	

Bottom of borehole at 28.30 feet.

TEST BORING REPORT - GINT STD US LAB.GDT - 8/22/19 08:36 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-45

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
25.0																	
25.5																	
26.0																	
26.5																	
27.0																	
27.5										See Test Boring Report	-	-	-	-	-	-	-
28.0																	
28.5	5.3	C-1	28.3 - 32.8	0.1 - -4.4	54 100%	27 50%	N/A		28.3	Strong, purple, fine to medium SANDSTONE, massive, slightly weathered to fresh.	28.4-28.6 28.5 28.7 28.7 28.9 28.9	J J J J J J	1-2 1-2 3-7 3-7 1-3 1-3	60 25 33 30 20 45	SM SM/SR SR SR SR/R SM	F F SW SW F F	None None None None None None
29.0																	
29.5	6.5						2			- Quartz vein near 28.6'. - Orthogonal joints near 28.7' and 28.9'.	29.4-29.5 29.9	J J	1-3 1-3	45 40	SR SM	F F	None None
30.0																	
30.5	6.6						3				30.1 30.2 30.7	J J B	1-3 1-4 1-3	40 30 35	SM SM/SR SM/SR	F F SW/F	None None None
31.0	5.2								30.5	Strong, purple/gray, conglomeratic SANDSTONE, laminated (1-5 mm±), slightly weathered to fresh. - Bedding planes at 40°. - Orthogonal joints near 31.1'.							
31.5							6				31.1 31.1 31.3 31.6 31.7 31.9	J J J B B J	1-5 1-3 1-10 1-5 1-3 1-5	20 40 45 40 30 20	SR SM SM SM/SR SM/SR SR	F F F SW SW SW	None None QZ QZ QZ QZ
32.0	5.6								32.0	Strong, purple, fine to medium SANDSTONE, laminated (<1 mm±), slightly weathered to fresh. - Bedding planes at 30°.							
32.5							3				32.1 32.2 32.6	B B J	1-2 1-2 1-3	40 40 21	SM/SR SM SM	SW/F SW F	None None None
33.0	7.5	C-2	32.8 - 37.5	-4.4 - -9.1	57 100%	51 91%											
33.5							4				33.0 33.5 33.9 33.9	B B J B	1 1-3 1-5 1-10	30 30 25 30	SM SM SR SR	F F SW SW/F	None None None QZ
34.0	5.3									- Orthogonal joints near 33.9'. - Quartz veins from 33.9'-34.1', 4 mm±.							
34.5							0				-	-	-	-	-	-	-
35.0	4.6																
35.5							1				35.3-35.4	J	1-5	45	SM	SW	None
36.0	5																
36.5							2				36.0 36.7	B B	1-3 1-4	30 30	SM SM	SW F	None None
37.0	5								36.7 36.8	Strong, purple/gray, conglomeratic SANDSTONE, massive, fresh.							
37.5							3			Strong, purple/gray, medium SANDSTONE, massive, slightly weathered to fresh.	37.4 37.7-37.9 37.8-37.9	J J J/S	1 1-6 1-5	20 60 50	SM SM/SR SL/SR	F F SW	None QZ QZ
38.0	5.75	C-3	37.5 - 42.4	-9.1 - -14.0	59 100%	53 94%											
38.5	5.6						2				38.6 38.6-38.8	J J	1-3 1-3	40 50	SM SM	F SW	Fe None
39.0																	
39.5	5						2				39.7 39.7-39.9	J J	1-2 1	20 50	SR SR/R	SW F	None None
40.0									39.7								

REMARKS:
1. Dip angles are measured from horizontal (i.e., perpendicular to the core axis).

WATER LEVEL DATA			
DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER

GROUND SURFACE EL. 28.4

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/10/19 16:46 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-45

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS
40.0										
40.5	5.5						0			Strong, purple, fine SANDSTONE, laminated to massive, slightly weathered to fresh. -Bedding planes at 30° from 41.3'-41.7'. *(continued)*
41.0										
41.5	5.2						ECF (7±)			- Laminated from 41.3'-41.7', 1-2 mm±.
42.0							10		42.0	
42.5	3	C-4	42.4 - 47.4	-14.0 - -19.0	60 100%	48 80%	1			Transitioning to strong, purple/gray, conglomeratic SANDSTONE, massive, fresh.
43.0										
43.5	3						2			
44.0										
44.5	2.9						0			
45.0										
45.5	3						3			- Orthogonal joints near 45.1'.
46.0									45.4	Strong, purple to purple/gray, medium SANDSTONE interlaminated with fine Sandstone (1 mm±), slightly weathered to fresh. - Bedding planes at 30°-50°.
46.5	3						5			
47.0										
47.5							ECF (6±)			- Orthogonal joints near 47.0'.
48.0							9			**Bottom of borehole at 47.4 feet.**
48.5										
49.0										
49.5										
50.0										
50.5										
51.0										
51.5										
52.0										
52.5										
53.0										
53.5										
54.0										
54.5										
55.0										
55.5										
56.0										

DISCONTINUITIES

Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
-	-	-	-	-	-	-
41.7	J	1-5	15	SR	SW	None
41.7-42.0	ECF	-	-	SR	SW	QZ
41.9-42.0	J	1-3	60	SR	SW	None
41.95-42.0	J	1-3	65	SR	SW	None
42.0-42.2	J	1-3	65	SR	SW	None
43.3	J	1	30	SR/R	SW/F	None
43.9	J	1	30	SM	SW	None
-	-	-	-	-	-	-
45.0	J	1-2	30	SR	SW/F	None
45.1-45.2	J	1-2	50	SR	SW/F	QZ
45.6	B	1	40	SR	SW	None
46.2	J	1-10	40	SM	SW	None
46.4-46.6	B	1-5	50	SM	SW	QZ
46.7-46.9	J	1-2	60	SM	SW/F	None
46.8-47.0	J	1	60	SM	F	None
46.9-47.0	J	1-5	80	SR/R	SW/F	None
47.0-47.4	J	1-5	80	SR/R	SW/F	None
47.1	J	1	20	SM	F	None
47.2	J	1	30	SM	SW	None
47.2-47.4	ECF	-	-	SM	SW	QZ

2. Boring was backfilled with cement-bentonite grout from the bottom of the boring to the ground surface. No groundwater monitoring well was installed.

CORE BORING REPORT - CORE BORING REPORT.GDT - 9/10/19 16:46 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-46

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 4/3/2019
FINISH 4/4/2019
DRILLER NEBC
LOGGED BY JPN
CHECKED BY RKM/SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	NX
Inside Diameter (in.)	4	1 3/8	1 7/8
Hammer Weight (lb.)	300	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Diedrich D-120
Bit Type: 3 7/8" Tricone Bit
Drill Fluid: Water
Casing: 4"
Hoist/Hammer: Automatic/Safety Hammer

ELEVATION 31.1 **NORTHING** 288470.367
DATUM NGVD 1929 **EASTING** 359386.873
LOCATION Jenks Way

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	31.1									
		X							10" Asphalt. (FILL)	10" ASPHALT
		24	14-25	S-1	10 / 12	1 - 2	SW		Wet, medium dense, brown, medium to coarse SAND, some fine to coarse gravel, little fine sand. (FILL)	PID = 0.1 ppm (1'-2') Composite environmental sample taken 1'-4'. (1) 8 oz. Amber, (1) 4 oz. Amber, VOAs.
		54	12-24-24-25 (48)	S-2	15 / 24	2 - 4	SW		Wet, dense, brown, medium to coarse SAND, some fine to coarse gravel, little fine sand, trace silt. (FILL)	PID = 0.1 ppm (2'-4')
		36								
5	26.1	23	10-7-7-6 (14)	S-3	15 / 24	4 - 6	SP-SM		Wet, medium dense, brown, fine to medium SAND and SILT, trace fine gravel. (FILL)	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 4 oz. Amber, VOAs.
		15								
		43	3-2-3-23 (5)	S-4	9 / 24	6 - 8	SW		Wet, loose, brown, fine to coarse SAND, some fine to coarse gravel, trace silt. (FILL)	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 4 oz. Amber, VOAs.
		28								
		29	6-3-2-3 (5)	S-5	12 / 24	8 - 10	SP-SM		Wet, loose, brown, fine to coarse SAND, some silt, little fine to coarse gravel, trace ceramic pieces, trace brick. (FILL)	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 4 oz. Amber, VOAs.
10	21.1	27								
		X	3-3-5-100/5"	S-6	18 / 23	10 - 11.9	SW		Wet, loose, brown, fine to coarse SAND and fine GRAVEL. (FILL)	PID = 0 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 4 oz. Amber, VOAs.
		46/0"								
		N/A							OBSTRUCTION	Unmarked 30" sewer (RCP).
		N/A								
15	16.1	N/A								
		N/A	18-28-28-21/5"	S-7	5 / 23	15.1 - 17	SP		Wet, very dense, brown, fine to medium SAND, trace fine gravel, trace coarse sand.	PID = 0 ppm
		N/A								

Bottom of borehole at 17.00 feet.

WATER LEVEL DATA

DATE/TIME	DEPTH (ft.) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. Spoon refusal at approximately 11.9'.
2. Bottom of casing was at approximately 11.9' at the end of day 4/3/19.
3. Driller cored from 11.9'-12.1' in 2.5 minutes.
4. Depth to the inside bottom of the obstruction is approximately 14.9'. Driller cored from 14.9'-15.1' in 5 minutes.
5. "X" within casing blows indicates blows were not counted at that interval.
6. NEBC backfilled the boring with two 50 lb. bags of bentonite chips from 11'± to near the ground surface. Approximately 2 gallons of cement grout were added at the surface.

TEST BORING REPORT - GINT STD US LAB.GDT - 8/6/19 11:11 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-46A

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 5/17/2019
FINISH 5/18/2019
DRILLER NEBC
LOGGED BY MLP
CHECKED BY SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	4	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile B-53
Bit Type: 3 7/8" Tricone
Drill Fluid: Water
Casing: 4"
Hoist/Hammer: Automatic Hammer

ELEVATION 30.9
DATUM NGVD 1929
NORTHING 288472.737
EASTING 359387.178
LOCATION Jenks Way (2.5' north of B17-46)

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	30.9									
		X							Hand excavated for the first 5' due to concerns over underground utilities. No soil samples were taken.	PID = 0.3 ppm Environmental sample was taken from the sidewall between 0'-1.5'. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		X								
		X								
		X								PID = 0.2 ppm Environmental sample was taken from the sidewall between 1.5'-3'. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		X								
5	25.9									
		X	4-4-3-5 (7)	S-1	13 / 24	5 - 7	SW		Moist, loose, brown, fine to coarse SAND, trace fine to coarse gravel, little silt. (FILL)	PID = 0.3 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		X								
		13	4-5-3-5 (8)	S-2	5 / 24	7 - 9	SP		Wet, loose, light brown, fine to medium SAND, trace coarse sand, trace fine gravel, trace silt. (FILL)	PID = 0.3 ppm (7'-9') Composite environmental sample taken (7'-13'). (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		11								
		X	6-4-2-2 (6)	S-3	1 / 24	9 - 11	SP		Wet, loose, light brown, fine to coarse SAND, trace coarse sand, trace fine gravel, trace silt. (FILL)	
10	20.9									
		20								PID = 0.3 ppm (9'-11)
		21	2-2-3-2 (5)	S-4	7 / 24	11 - 13	SP-SM		Wet, loose, light brown, fine to coarse SAND and fine to coarse GRAVEL, little silt, trace brick. (FILL)	
		36								PID = 0.3 ppm (11'-13')
		X	3-2-5-5 (7)	S-5	13 / 24	13 - 15	ML		Wet, medium, dark brown/black SILT, some fine to coarse sand, some fine to coarse gravel, trace glass, trace plastic. (FILL)	PID = 0.4 ppm Environmental sample taken. (1) 8 oz. Amber, (1) 2 oz. Amber, (3) VOAs.
		X								
15	15.9									
		X	19-14-28-19 (42)	S-6	12 / 24	15 - 17	SW		Wet, dense, brown, fine to coarse SAND, some fine to coarse gravel, trace silt.	PID = 0.7 ppm
		151								
		33*	12-10-21-23 (31)	S-7	14 / 24	17 - 19	GM		Wet, dense, brown/orange, fine to coarse GRAVEL, some fine to coarse sand, some silt.	PID = 0.5 ppm
		40*								
		X	26-18-21-16 (39)	S-8	7 / 24	19 - 21	GW		Wet, dense, brown, fine to coarse GRAVEL, little fine to coarse sand, trace silt.	PID = 0.1 ppm
20	10.9									
		X								
		62*	18-24-17-13 (41)	S-9	10 / 24	21 - 23	GW		Wet, dense, brown, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	PID = 0.0 ppm
		X								
			59/3"	S-10	3 / 3	23 - 23.3	GP		Weathered SANDSTONE recovered as wet, very dense, brown, fine to medium SAND and coarse GRAVEL, little silt, sandstone in tip.	SPT Refusal at 23.3'.

Bottom of borehole at 23.30 feet.

WATER LEVEL DATA

DATE/TIME	DEPTH (ft.) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. Elevation is based on milled pavement.
2. "X" within casing blows indicates blows were not counted at that interval.
3. Driller spun casing from 5'-7', 13'-16', and 19'-21'.
4. *Driller advanced the rollerbit ahead of the casing.
5. Boring was backfilled on 5/18/19 with cement bentonite grout from the bottom of the borehole to the ground surface.

TEST BORING REPORT - GINT STD US LAB.GDT - 8/6/19 11:11 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-46A

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS
20.0										
20.5										See Test Boring Report
21.0										
21.5										
22.0										
22.5										
23.0										
23.5	3.2	C-1	23.3 - 26.4	7.6 - 4.5	29.5 80%	21.5 58%	N/A		23.3	Strong, gray, conglomeratic SANDSTONE, massive, slightly weathered to fresh.
24.0									23.8	Lost Core. No Recovery.
24.5	4						N/A		24.4	Strong, gray to light purple, fine to medium SANDSTONE, laminated (1-5 mm±) and massive, slightly weathered to fresh. - Bedding planes at 40°-50°. - Orthogonal joints near 24.7'. - Conglomeratic Sandstone interbedded near 24.9', 2-4 cm±.
25.0										
25.5	3						0			
26.0										
26.5	3.5	C-2	26.4 - 31.4	4.5 - -0.5	60 100%	60 100%	1			
27.0										
27.5	3.5						1		27.3	Very strong, gray, conglomeratic SANDSTONE, massive, fresh.
28.0										
28.5	4.7						0			
29.0										
29.5	3.7						0			
30.0										
30.5	3.1						0			
31.0										
31.5	5.2	C-3	31.4 - 36	-0.5 - -5.1	55 100%	55 100%	0		31.1	Very strong, gray, medium to coarse SANDSTONE, massive, fresh.
32.0									31.5	Very strong, gray, conglomeratic SANDSTONE, massive, fresh.
32.5	5.7						0			
33.0										
33.5	6.2						1			
34.0										
34.5	5.7						0			
35.0										

DISCONTINUITIES

Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
23.8	J	1-3	15	SR	SW	Fe
24.4-24.5 24.5 24.6 24.8	ECF J J J	- 1-3 0-1 1	- 30 40 30	SR SM SM/SL SR	SW SW SW SW	Fe Fe Fe Fe
-	-	-	-	-	-	-
26.1	J	1-2	25	SR	SW	None
27.0	J	1	40	SM/SR	SW	Fe
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
33.8	J	1	40	SR	F	None
-	-	-	-	-	-	-

REMARKS:
1.*The water level was influenced by the soil casing being sealed into bedrock.

WATER LEVEL DATA

DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER
5/18/2019 8:10:00 AM	23.3	28.3	3.4*

GROUND SURFACE EL. 30.9

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

(Continued Next Page)

CORE BORING REPORT - CORE BORING REPORT.GDT - 8/6/19 11:27 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-46A

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
35.0	5						0			Very strong, gray, conglomeratic SANDSTONE, massive, fresh. *(continued)*	-	-	-	-	-	-	-
35.5									35.6	Very strong, gray, medium to coarse SANDSTONE, massive, fresh.							
36.0	4	C-4	36 - 41.2	-5.1 - -10.3	61 98%	57 92%	1		36.4	Strong, gray to purple, fine SANDSTONE, laminated (1 mm±), slightly weathered to fresh. - Bedding planes at 20°-30°.	36.0-36.6	J	1-3	75	SR	F	QZ/Fe
36.5																	
37.0	4						1				37.5	J	1-10	35	SM/SR	SW	None
37.5																	
38.0	2.8						2				38.0 38.7	J J	1-5 1	30 20	SR SR	SW SW	Fe Fe/QZ
38.5																	
39.0	3.9						0				-	-	-	-	-	-	-
39.5																	
40.0	5						0				-	-	-	-	-	-	-
40.5																	
41.0	4.4	C-5	41.2 - 43.2	-10.3 - -12.3	24 100%	18.5 77%	1				41.7	J	1	30	SM	SW	Fe
41.5																	
42.0	4						2			- Quartz veins from 42.2'-42.6', 1 mm±.	42.0 42.2	J J	1-2 1	40 40	SR SM/SR	SW SW	Fe Fe
42.5																	
43.0										**Bottom of borehole at 43.2 feet.**							
43.5																	
44.0																	
44.5																	
45.0																	
45.5																	
46.0																	
46.5																	
47.0																	
47.5																	
48.0																	
48.5																	
49.0																	
49.5																	
50.0																	
50.5																	
51.0																	

2.Boring was backfilled with cement-bentonite grout from the bottom of the boring to the ground surface. No groundwater monitoring well was installed.

CORE BORING REPORT - CORE BORING REPORT.GDT - 8/6/19 11:27 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

WELL/PIEZOMETER INSTALLATION SKETCH

Project Name: NBC CSO PHASE III

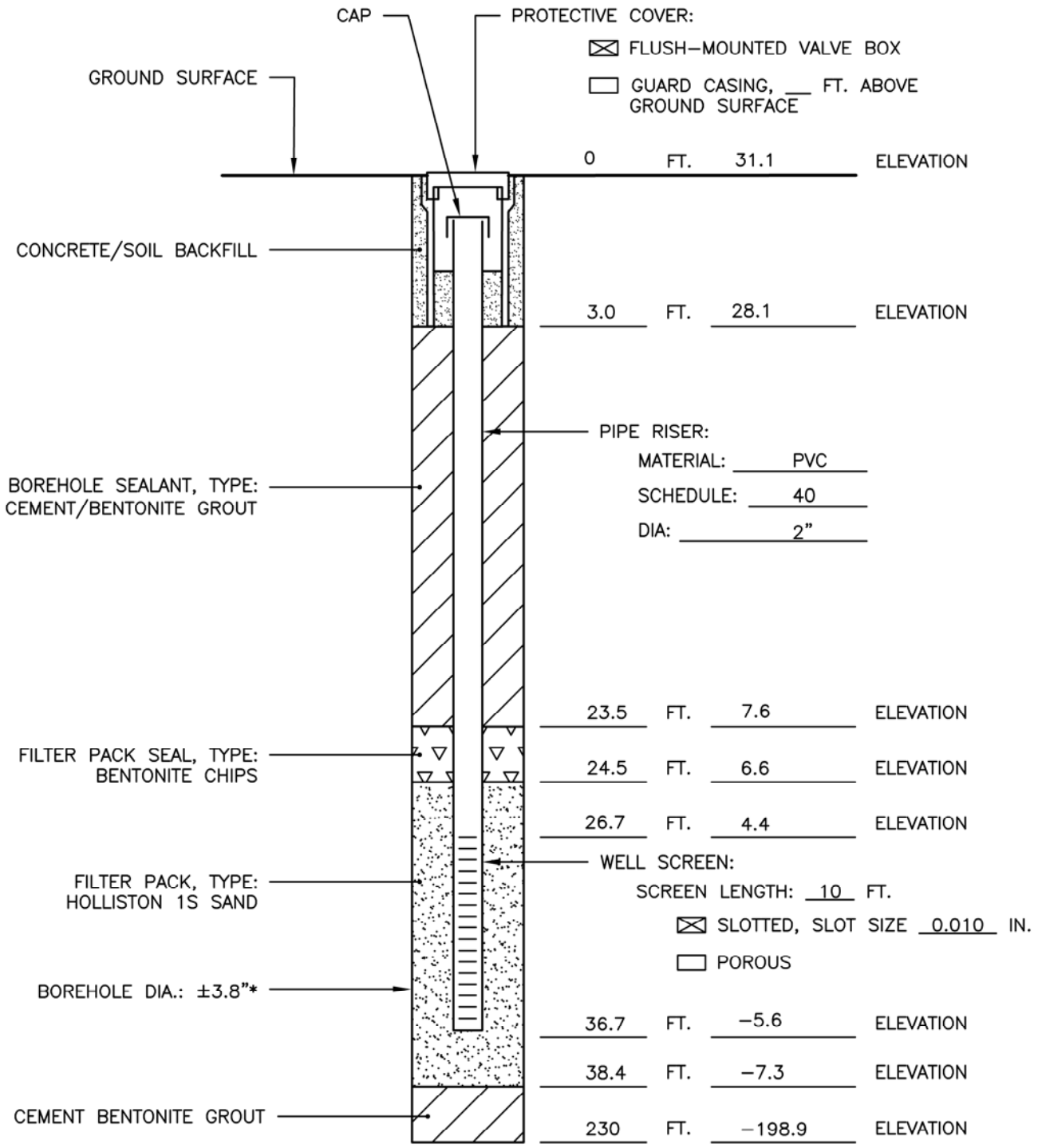
WELL/PIEZO NO.: B17-8

Pare Project Number: 14106.02

Sheet 1 of 1

Field Engineer: H. Shanks/R. Muganga

Date: 1-30-19, 2-4-19, and 2-5-19



Remarks:

*At the beginning of the day on 2/4/19, grout was measured at approximately 30.7 feet below ground. New England Boring Contractors advanced a 5-inch diameter roller bit to approximately 38.4 feet.

WELL/PIEZOMETER WATER LEVEL RECORD

Project Name NBC CSO Phase III **WELL/PIEZO. NO.** B17-8

Project Number 14106.02 **Sheet** 1 **of** 1

Reference(1) Ground Surface **Ref. Elev.** 31.1 NGVD 29

Foundation Sensed Rock Elevation minus +/- 10 feet

Location Description(2) Masonic Temple

Date	Time	Read By	Depth to Water (ft)	Elevation of Water (ft)	Remarks
03-19-18	-	SMA	14.6	16.5	Open Boring (Packer Testing)
03-22-18	-	JMC	12.2	18.9	Open Boring (Packer Testing)
04-05-18	10:45	JMC	13.0	18.1	Open Boring
05-01-18	1:10	HMS	12.6	18.5	Open Boring
05-18-18	4:00	HMS	13.2	17.9	Open Boring
05-29-18	9:10	HMS	13.1	18.0	Open Boring
06-12-18	9:30	HMS	13.2	17.9	Open Boring
07-25-18	8:40	JMC	13.3	17.8	Open Boring
11-02-18	-	MM	13.6	17.5	Open Boring
11-28-18	3:10	MM	13.9	17.2	Open Boring
12-26-18	9:55	HMS	13.7	17.4	Open Boring
01-23-19	2:15	JMC	13.9	17.2	Open Boring
02-07-19	10:20	HMS	17.8	13.3	Groundwater Well
03-18-19	10:30	RKM	17.6	13.5	Groundwater Well
04-09-19	11:45	JMC	17.9	13.2	Groundwater Well
04-23-19	2:45	HP	17.5	13.6	Groundwater Well; measured before well development.
04-24-19	9:50	HP	17.8	13.3	Groundwater Well; measured before well development.

(1) Normally, the top of protective casing. (2) Street intersection, address, etc.

WELL/PIEZOMETER WATER LEVEL RECORD

Project Name NBC CSO Phase III **WELL/PIEZO. NO.** B17-8

Project Number 14106.02 **Sheet** 1 **of** 1

Date	Time	Read By	Depth to Water (ft)	Elevation of Water (ft)	Remarks
04-25-19	9:00	HP	19.8	11.3	Groundwater Well; measured before well development.
04-26-19	9:50	HP	19.65	11.45	Groundwater Well; measured before well development.
05-09-19	12:15	JPN	17.3	13.8	Groundwater Well
05-15-19	9:10	HP	17.4	13.7	Groundwater Well

(1) Normally, the top of protective casing. (2) Street intersection, address, etc.

WELL/PIEZOMETER INSTALLATION SKETCH

Project Name: NBC CSO PHASE III

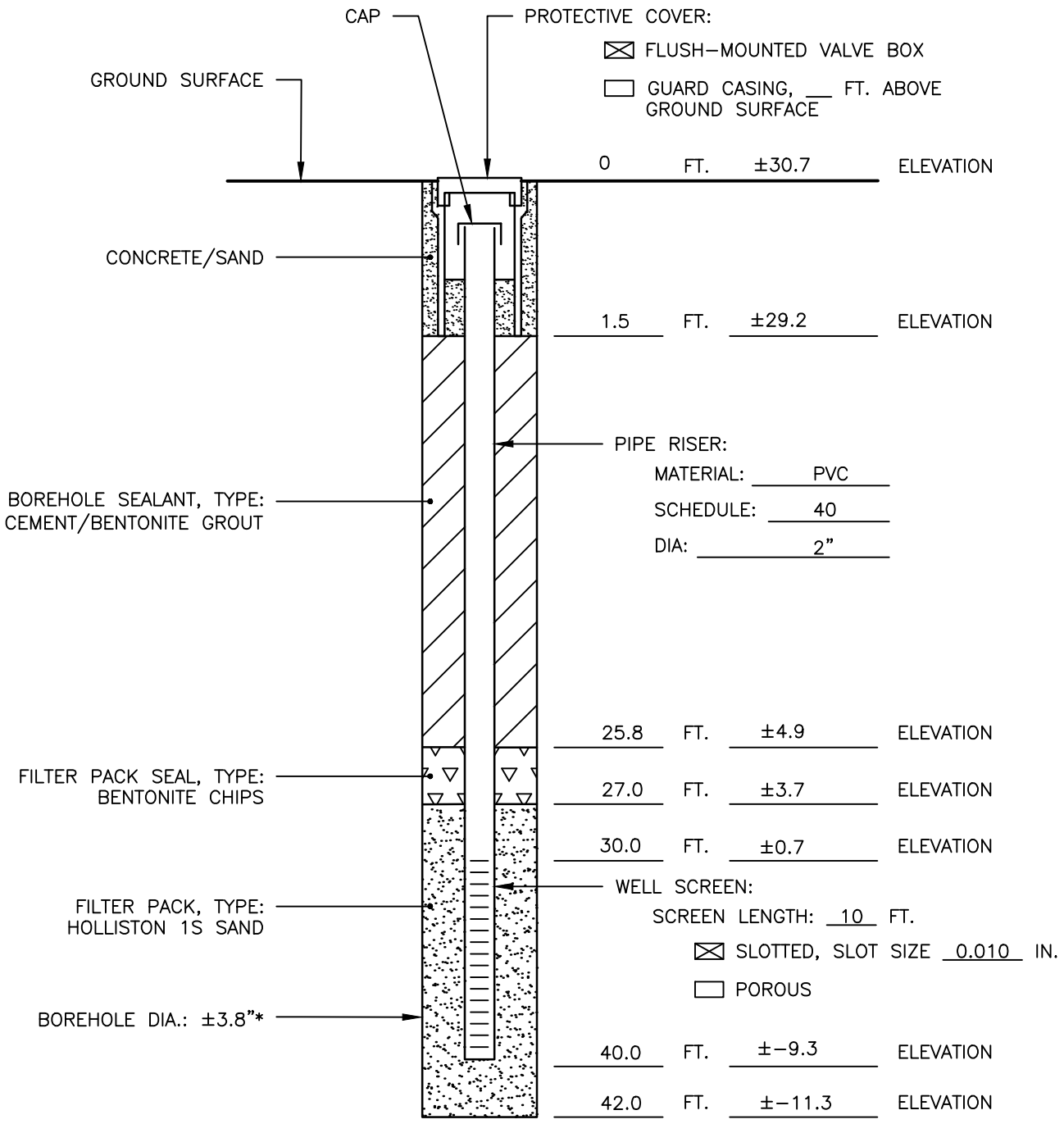
WELL/PIEZO NO.: B17-8A

Pare Project Number: 14106.02

Sheet 1 of 1

Field Engineer: R. Lozinski

Date: 6-11-19



Remarks:
The original well (B17-8) has been removed and a new well (B17-8A) installed.

WELL/PIEZOMETER WATER LEVEL RECORD

Project Name NBC CSO Phase III **WELL/PIEZO. NO.** B17- 8A

Project Number 14106.02 **Sheet** 1 **of** 1

Reference(1) Ground Surface **Ref. Elev.** 30.7 NGVD 29

Foundation Sensed Rock Elevation +/- 10 feet.

Location Description(2) Masonic Temple

Date	Time	Read By	Depth to Water (ft)	Elevation of Water (ft)	Remarks
07-01-19	12:40	RAL	18.0	12.7	Groundwater Well; ¼-inch diameter vent installed.
07-19-19	12:50	JPN	16.4	14.3	Vented Groundwater Well; measured before well development.
08-01-19	9:20	MLP	17	13.7	Vented Groundwater Well; measured before well development.
08-01-19	12:05	MLP	16.3	14.4	Vented Groundwater Well; measured before well development.
08-02-19	11:50	JPN	18.2	12.5	Vented Groundwater Well; measured before well development.
08-05-19	7:30	JPN	18.0	12.7	Vented Groundwater Well; measured before well development.
08-06-19	7:30	HMS	18.7	12.0	Vented Groundwater Well; measured before well development.
08-09-19	7:15	MLP	17.9	12.8	Vented Groundwater Well; measured before well development.
08-14-19	2:30	JPN	17.5	13.2	Vented Groundwater Well; measured before well development.
08-15-19	5:00	JPN	18.4	12.3	Vented Groundwater Well; measured before well development.
08-22-19	3:30	HP	17.5	13.2	Vented Groundwater Well; measured before well sampling.
09-03-19	4:50	JPN	17.7	13.0	Groundwater Well; ¼-inch diameter vent installed.
11-14-19	3:07	RAL	17.8	12.9	Groundwater Well; ¼-inch diameter vent installed.

(1) Normally, the top of protective casing. (2) Street intersection, address, etc.

WELL/PIEZOMETER WATER LEVEL RECORD

Project Name NBC CSO Phase III **WELL/PIEZO. NO.** B17-39

Project Number 14106.02 **Sheet** 1 **of** 1

Reference(1) Ground Surface **Ref. Elev.** 32.0 NGVD 29

Foundation Sensed N/A

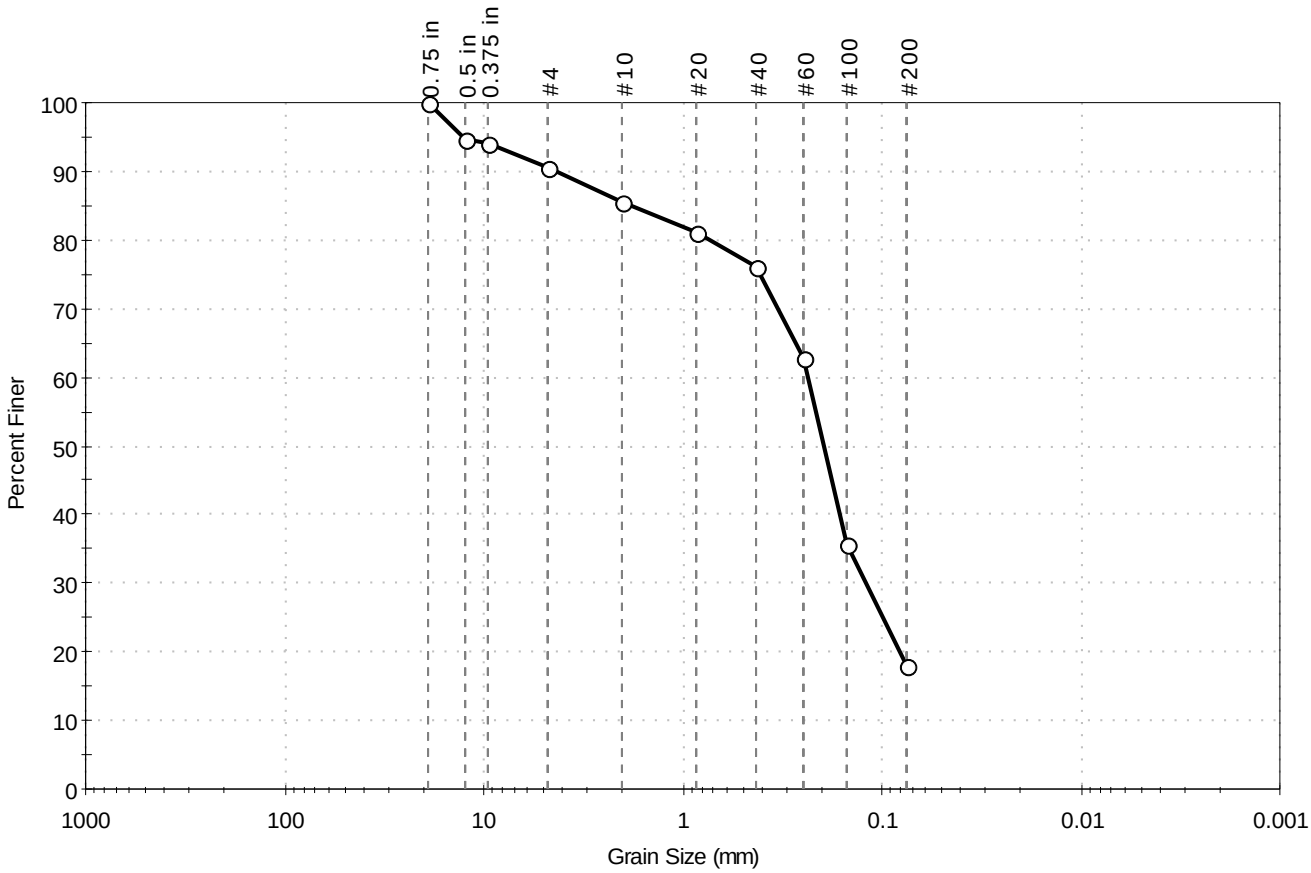
Location Description(2) Masonic Temple

Date	Time	Read By	Depth to Water (ft)	Elevation of Water (ft)	Remarks
08-12-19	7:00	JPN	3.5	28.5	Open Boring (Packer Testing)
08-13-19	7:00	JPN	3.5	28.5	Open Boring (Packer Testing)
08-14-19	7:00	JPN	5.0	27.0	Open Boring (Packer Testing)
09-03-19	4:50	JPN	11.8	20.2	Open Boring

(1) Normally, the top of protective casing. (2) Street intersection, address, etc.

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-8	Sample Type: jar	Tested By:	jbr
Sample ID: S-4	Test Date: 05/29/18	Checked By:	emm
Depth : 6-8	Test Id: 456249		
Test Comment:	---		
Visual Description:	Moist, pale brown silty sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	9.6	72.3	18.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	94		
#4	4.75	90		
#10	2.00	85		
#20	0.85	81		
#40	0.42	76		
#60	0.25	63		
#100	0.15	36		
#200	0.075	18		

Coefficients

D_{85} = 1.8218 mm D_{30} = 0.1201 mm
D_{60} = 0.2369 mm D_{15} = N/A
D_{50} = 0.1964 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

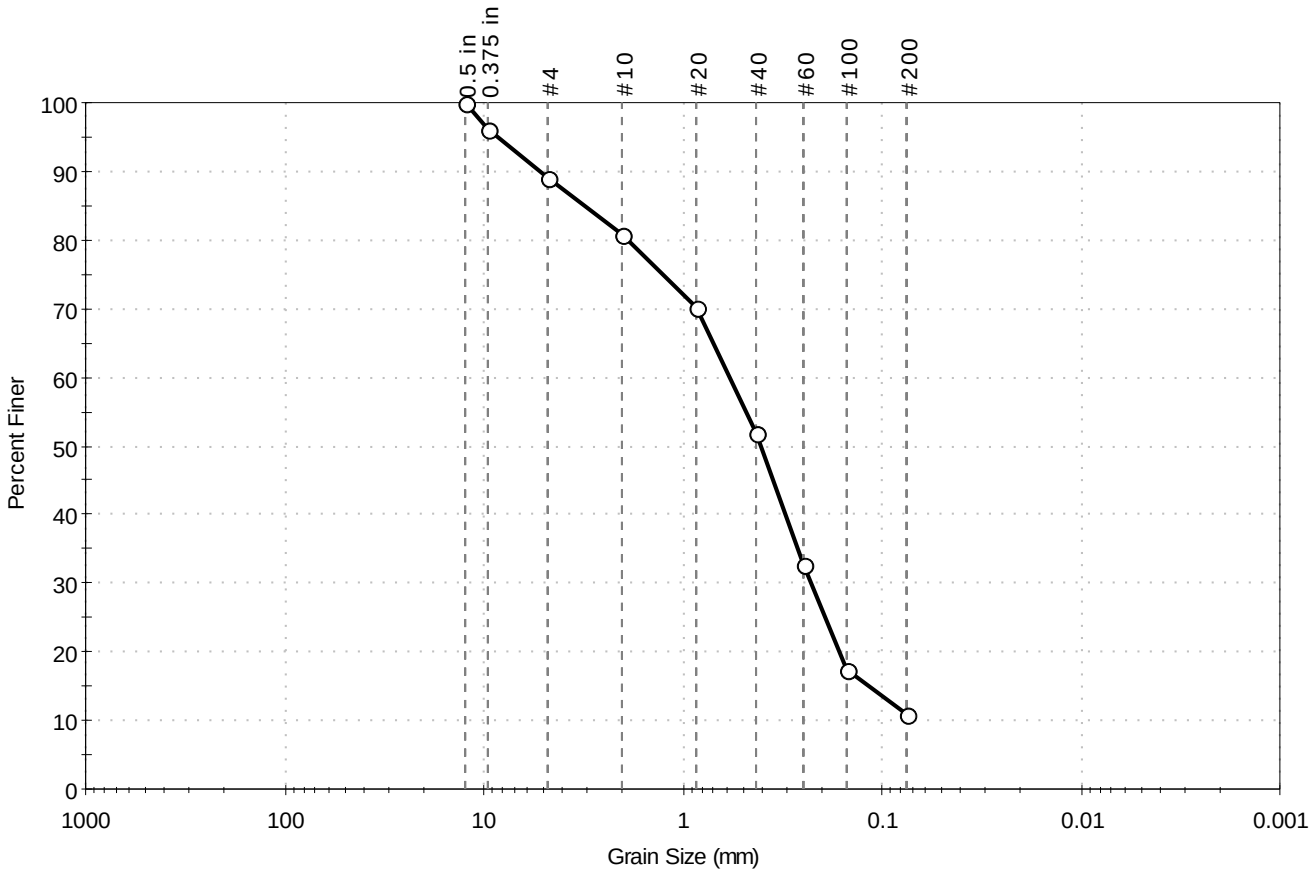
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:43 AM

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-8	Sample Type: jar	Tested By:	jbr
Sample ID: S-8	Test Date: 05/29/18	Checked By:	emm
Depth : 14-16	Test Id: 456250		
Test Comment:	---		
Visual Description:	Moist, very dark brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	11.0	78.1	10.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	96		
#4	4.75	89		
#10	2.00	81		
#20	0.85	70		
#40	0.42	52		
#60	0.25	33		
#100	0.15	17		
#200	0.075	11		

Coefficients

D_{85} = 3.1141 mm D_{30} = 0.2290 mm
D_{60} = 0.5781 mm D_{15} = 0.1162 mm
D_{50} = 0.4032 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

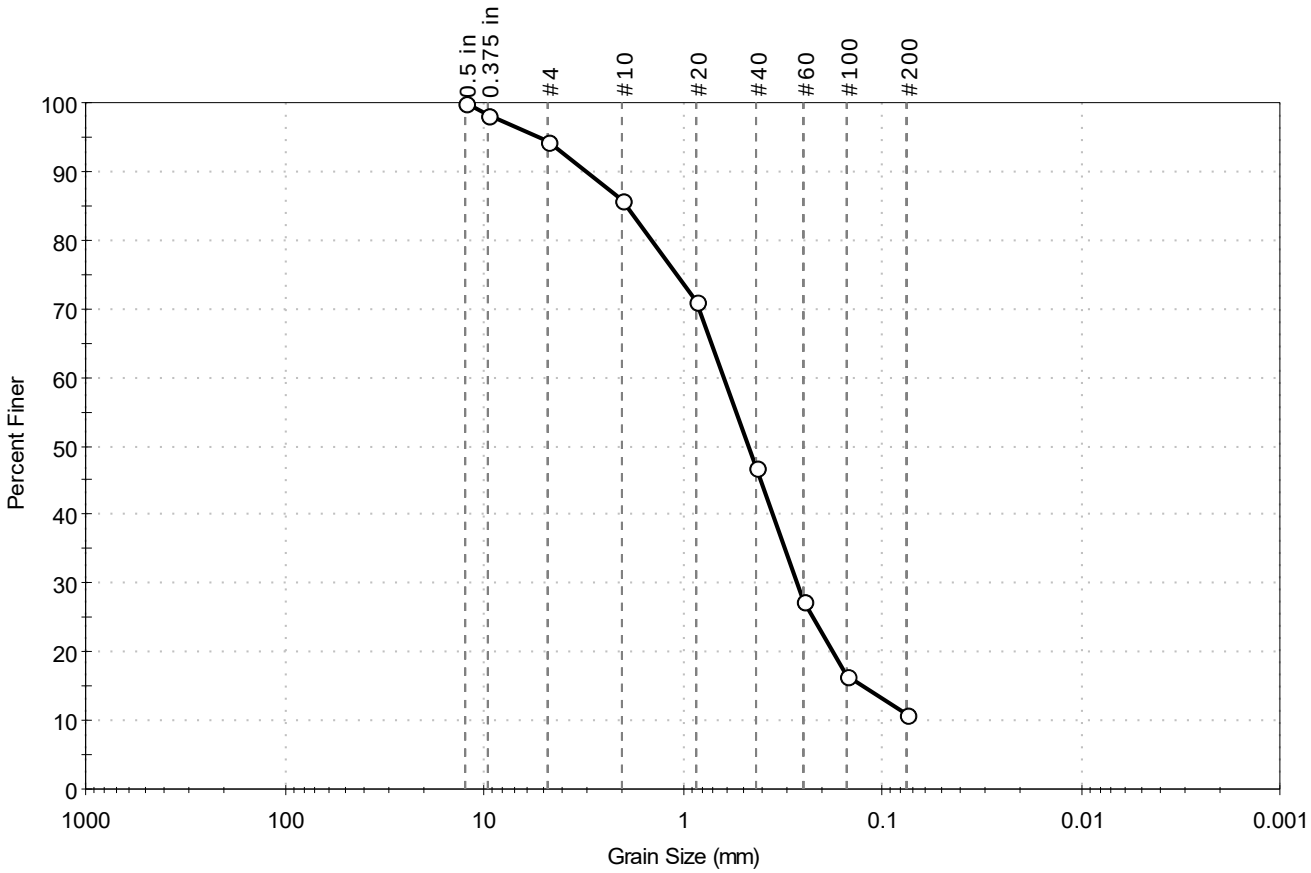
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:43 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-39	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-2 (2 jars)	Test Date:	08/28/19	Checked By:	bfs
Depth :	2-4	Test Id:	519879		
Test Comment:	---				
Visual Description:	Moist, olive brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	5.5	83.7	10.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	98		
#4	4.75	94		
#10	2.00	86		
#20	0.85	71		
#40	0.42	47		
#60	0.25	27		
#100	0.15	16		
#200	0.075	11		

Coefficients

D_{85} = 1.8953 mm D_{30} = 0.2683 mm

D_{60} = 0.6192 mm D_{15} = 0.1258 mm

D_{50} = 0.4640 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

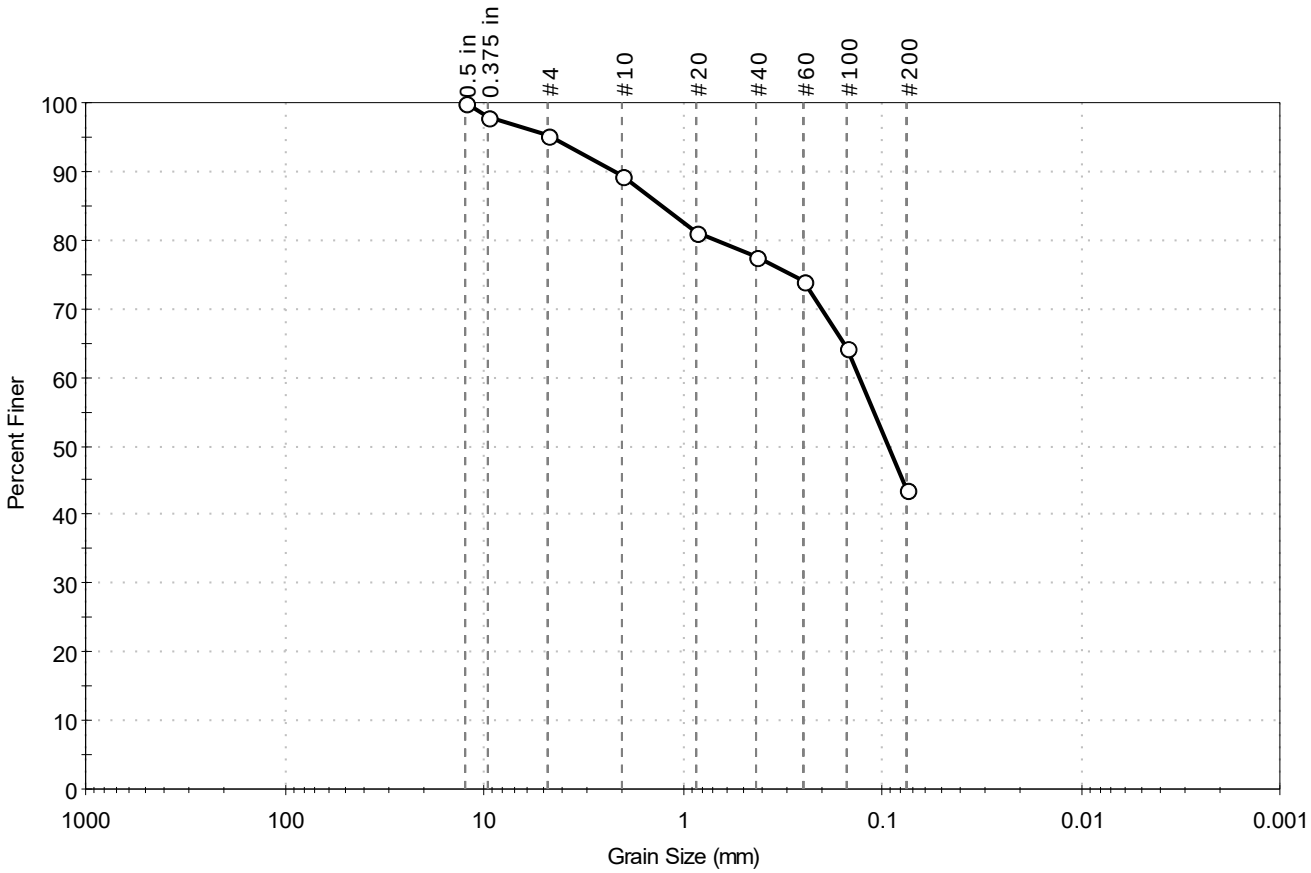
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/30/2019 11:17:28 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-39	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-6	Test Date:	08/28/19	Checked By:	bfs
Depth :	10-12	Test Id:	519880		
Test Comment:	---				
Visual Description:	Moist, brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	4.9	51.5	43.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	98		
#4	4.75	95		
#10	2.00	89		
#20	0.85	81		
#40	0.42	77		
#60	0.25	74		
#100	0.15	64		
#200	0.075	44		

Coefficients

D_{85} = 1.2663 mm D_{30} = N/A

D_{60} = 0.1299 mm D_{15} = N/A

D_{50} = 0.0928 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

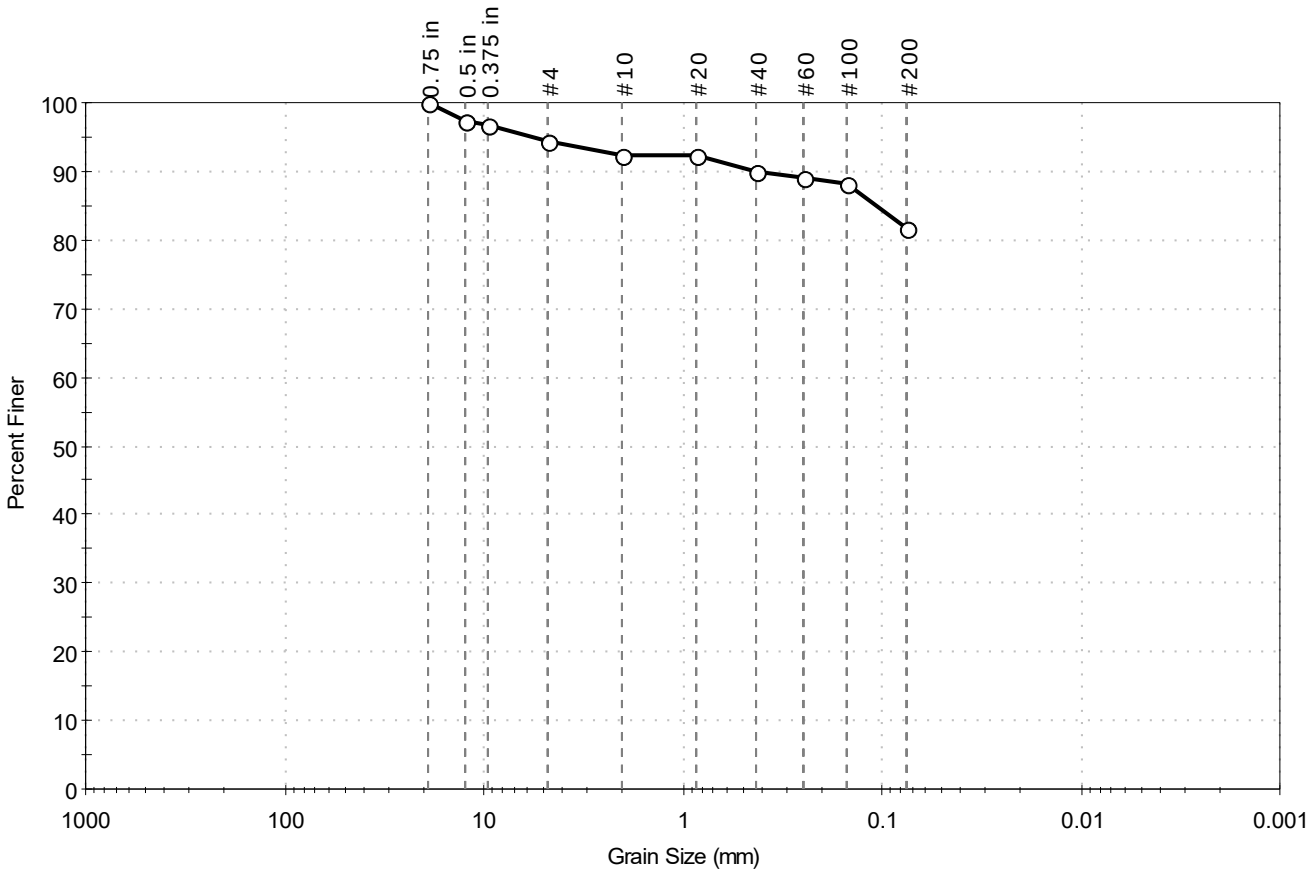
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/30/2019 11:17:29 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-39	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-8 (3 jars)	Test Date:	08/28/19	Checked By:	bfs
Depth :	14-16	Test Id:	519881		
Test Comment:	---				
Visual Description:	Moist, dark yellowish brown clay with sand				
Sample Comment:	Removed one unrepresentitive 1" rock weighting 57.57 g				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	5.6	12.7	81.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	97		
#4	4.75	94		
#10	2.00	92		
#20	0.85	92		
#40	0.42	90		
#60	0.25	89		
#100	0.15	88		
#200	0.075	82		

Coefficients

D_{85} = 0.1058 mm	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Lean CLAY with Sand (CL)

AASHTO Silty Soils (A-4 (5))

Sample/Test Description

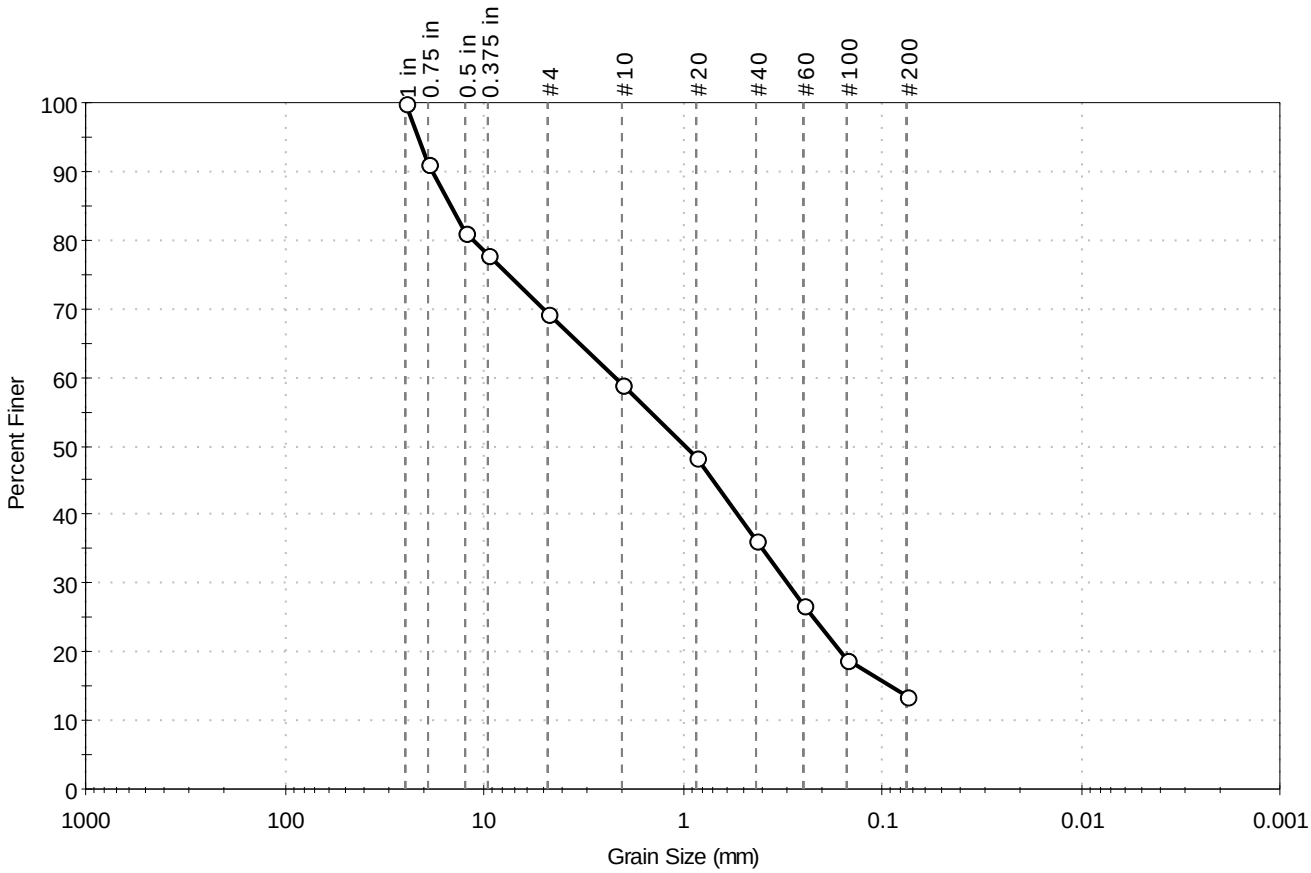
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/30/2019 11:17:30 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-40	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-1	Test Date:	05/29/18	Checked By:	emm
Depth :	0.5-2.5	Test Id:	456240		
Test Comment:	---				
Visual Description:	Moist, dark brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	30.7	55.8	13.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	91		
0.5 in	12.50	81		
0.375 in	9.50	78		
#4	4.75	69		
#10	2.00	59		
#20	0.85	48		
#40	0.42	36		
#60	0.25	27		
#100	0.15	19		
#200	0.075	13		

Coefficients

D_{85} = 14.6318 mm D_{30} = 0.2979 mm

D_{60} = 2.1787 mm D_{15} = 0.0914 mm

D_{50} = 0.9768 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

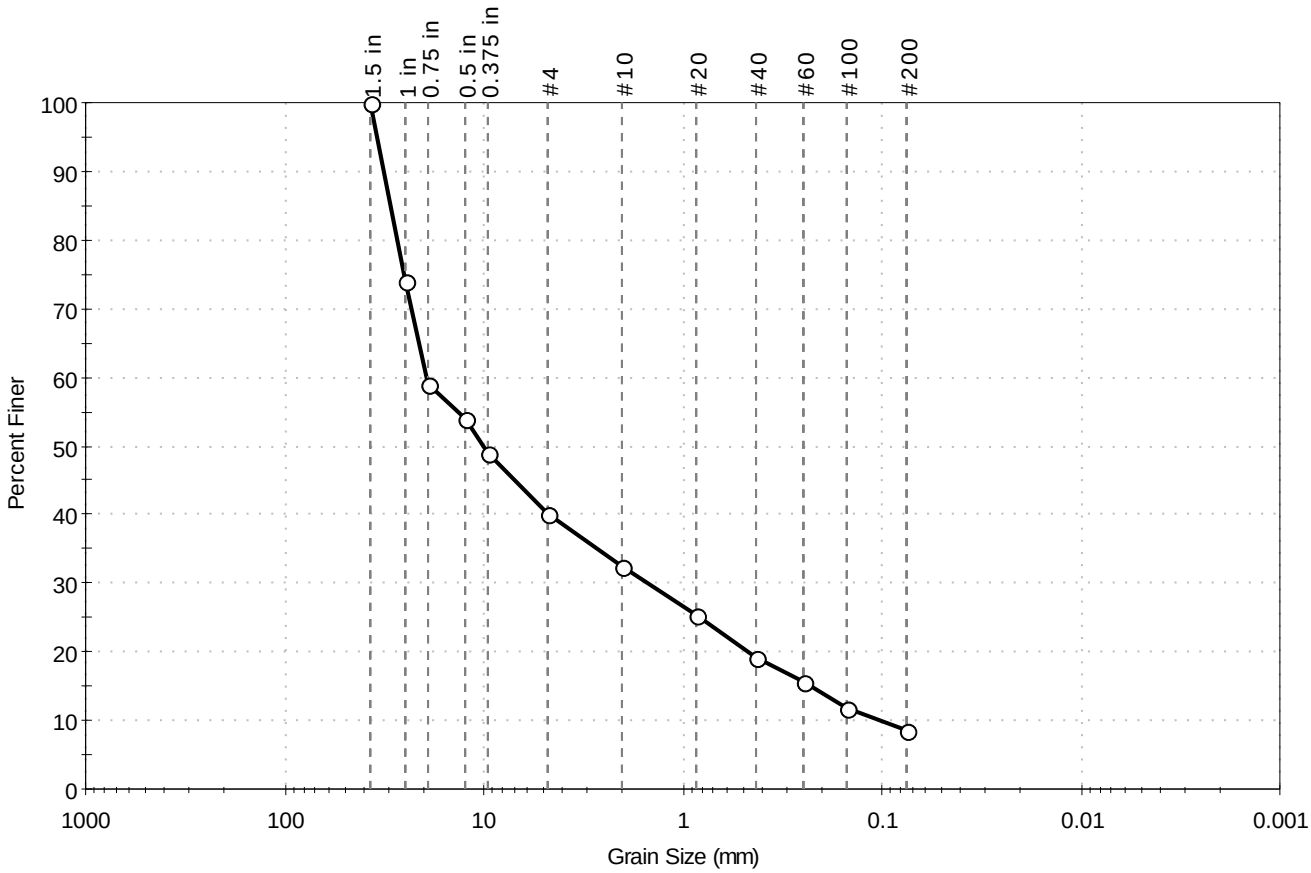
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:48 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-40	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	05/29/18	Checked By:	emm
Depth :	6-8	Test Id:	456241		
Test Comment:	---				
Visual Description:	Moist, dark gray gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	59.7	31.8	8.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	74		
0.75 in	19.00	59		
0.5 in	12.50	54		
0.375 in	9.50	49		
#4	4.75	40		
#10	2.00	33		
#20	0.85	25		
#40	0.42	19		
#60	0.25	15		
#100	0.15	12		
#200	0.075	8.5		

Coefficients

D_{85} = 29.6316 mm D_{30} = 1.4707 mm
D_{60} = 19.3202 mm D_{15} = 0.2331 mm
D_{50} = 10.0961 mm D_{10} = 0.1026 mm
C_u = 188.306 C_c = 1.091

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

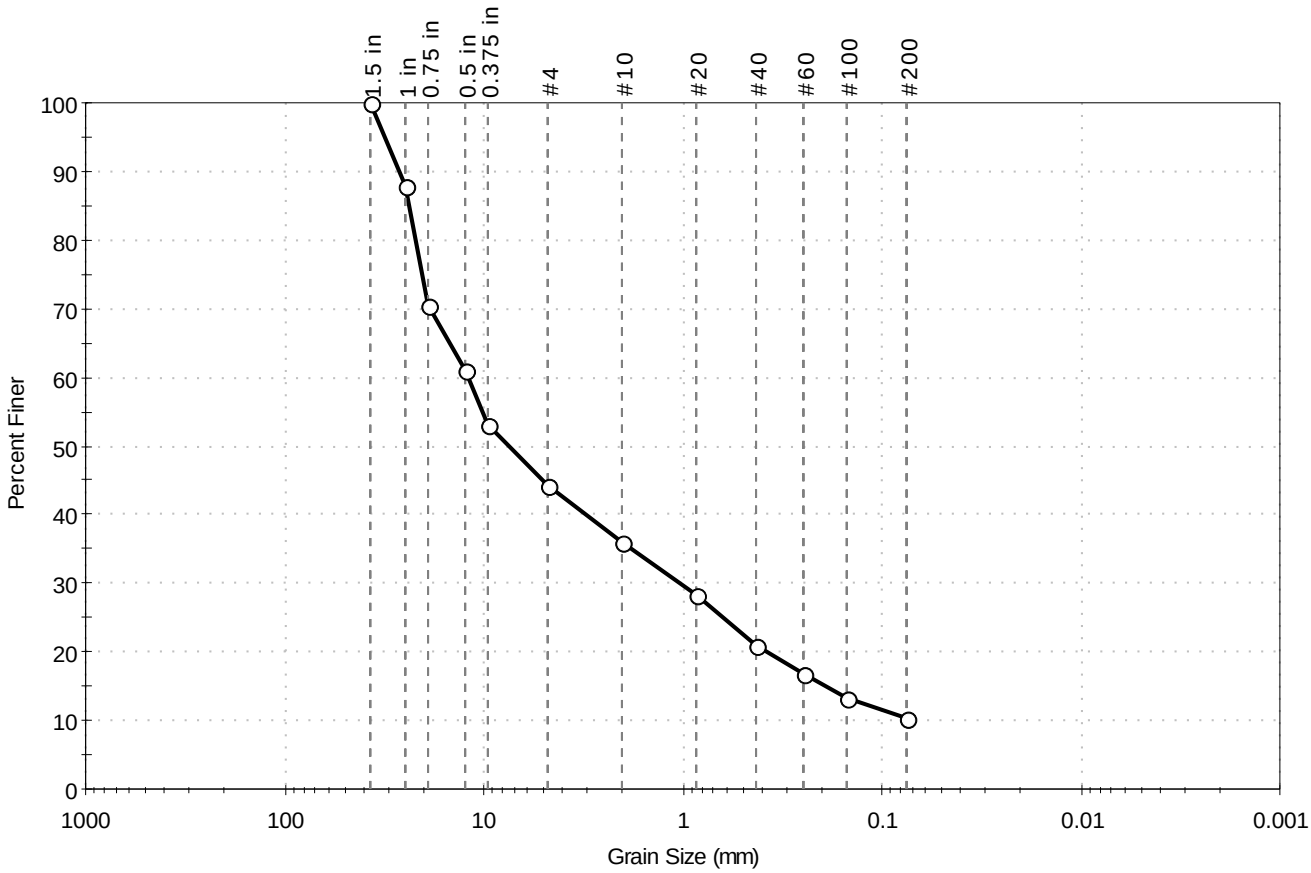
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-40	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-5	Test Date:	06/14/18	Checked By:	emm
Depth :	8-10	Test Id:	457943		
Test Comment:	---				
Visual Description:	Moist, gray gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	55.8	34.0	10.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	88		
0.75 in	19.00	71		
0.5 in	12.50	61		
0.375 in	9.50	53		
#4	4.75	44		
#10	2.00	36		
#20	0.85	28		
#40	0.42	21		
#60	0.25	17		
#100	0.15	13		
#200	0.075	10		

Coefficients

D_{85} = 23.9120 mm D_{30} = 1.0329 mm

D_{60} = 12.0447 mm D_{15} = 0.1898 mm

D_{50} = 7.4379 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-a (0))

Sample/Test Description

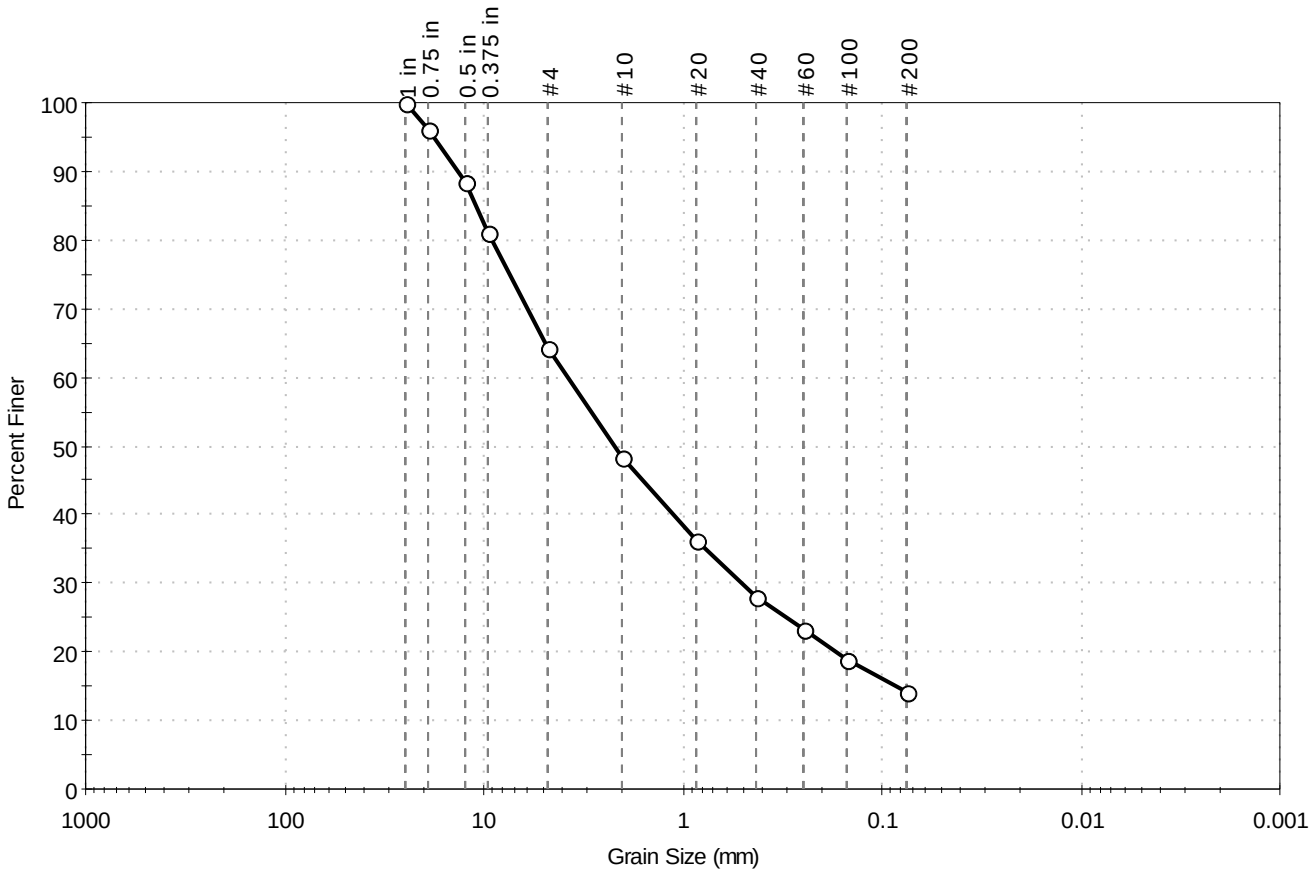
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/2/2018 12:51:26 PM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-40	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-7	Test Date:	05/29/18	Checked By:	emm
Depth :	12-14	Test Id:	456242		
Test Comment:	---				
Visual Description:	Moist, dark brownish gray silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	35.8	50.1	14.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	96		
0.5 in	12.50	89		
0.375 in	9.50	81		
#4	4.75	64		
#10	2.00	48		
#20	0.85	36		
#40	0.42	28		
#60	0.25	23		
#100	0.15	19		
#200	0.075	14		

Coefficients

D_{85} = 10.9462 mm D_{30} = 0.4969 mm
D_{60} = 3.7774 mm D_{15} = 0.0855 mm
D_{50} = 2.1870 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-a (0))

Sample/Test Description

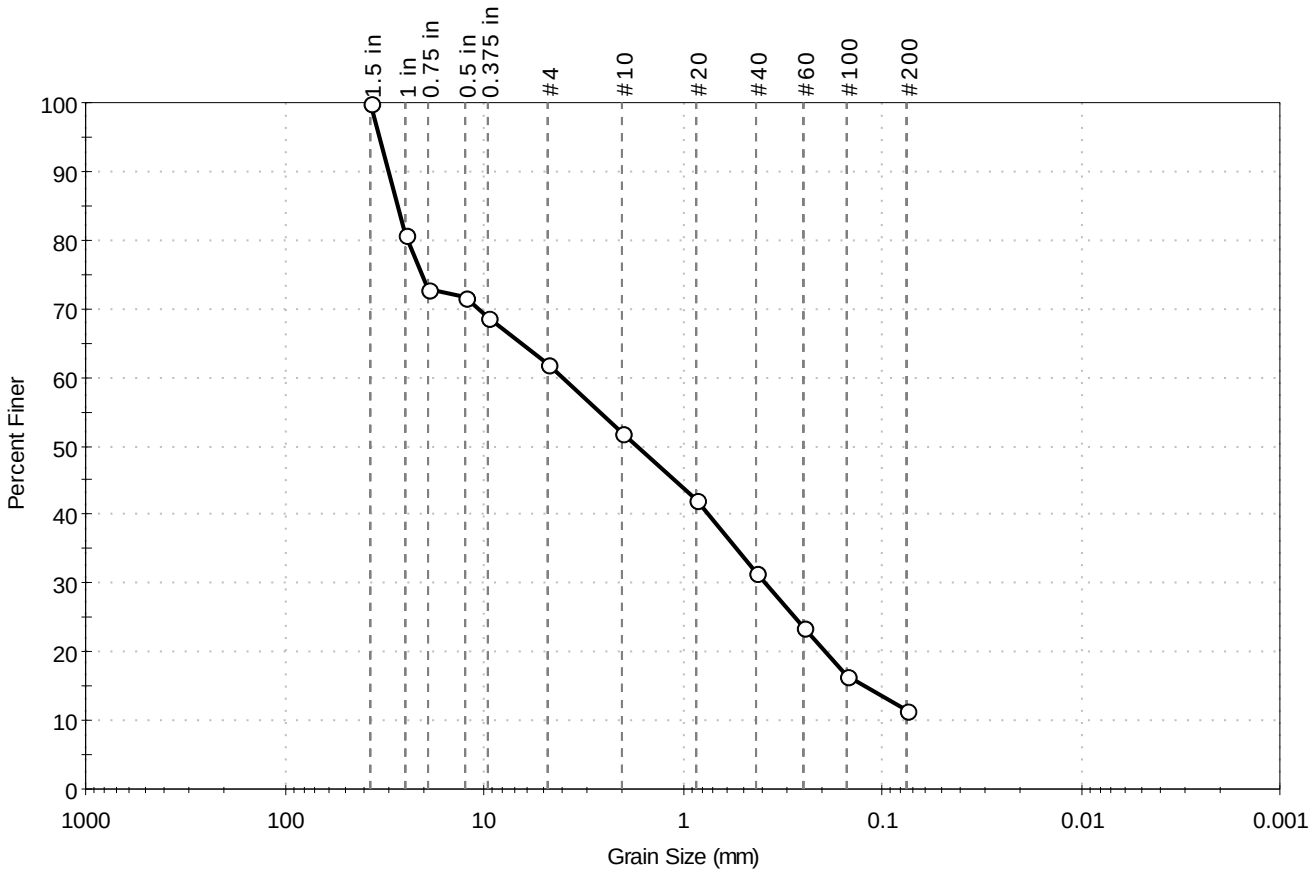
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:49 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-41	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-1A	Test Date:	05/29/18	Checked By:	emm
Depth :	0.75-2.75	Test Id:	456243		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	38.2	50.2	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	81		
0.75 in	19.00	73		
0.5 in	12.50	72		
0.375 in	9.50	69		
#4	4.75	62		
#10	2.00	52		
#20	0.85	42		
#40	0.42	32		
#60	0.25	24		
#100	0.15	17		
#200	0.075	12		

Coefficients

D_{85} = 27.3599 mm D_{30} = 0.3803 mm
D_{60} = 4.0503 mm D_{15} = 0.1202 mm
D_{50} = 1.6817 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

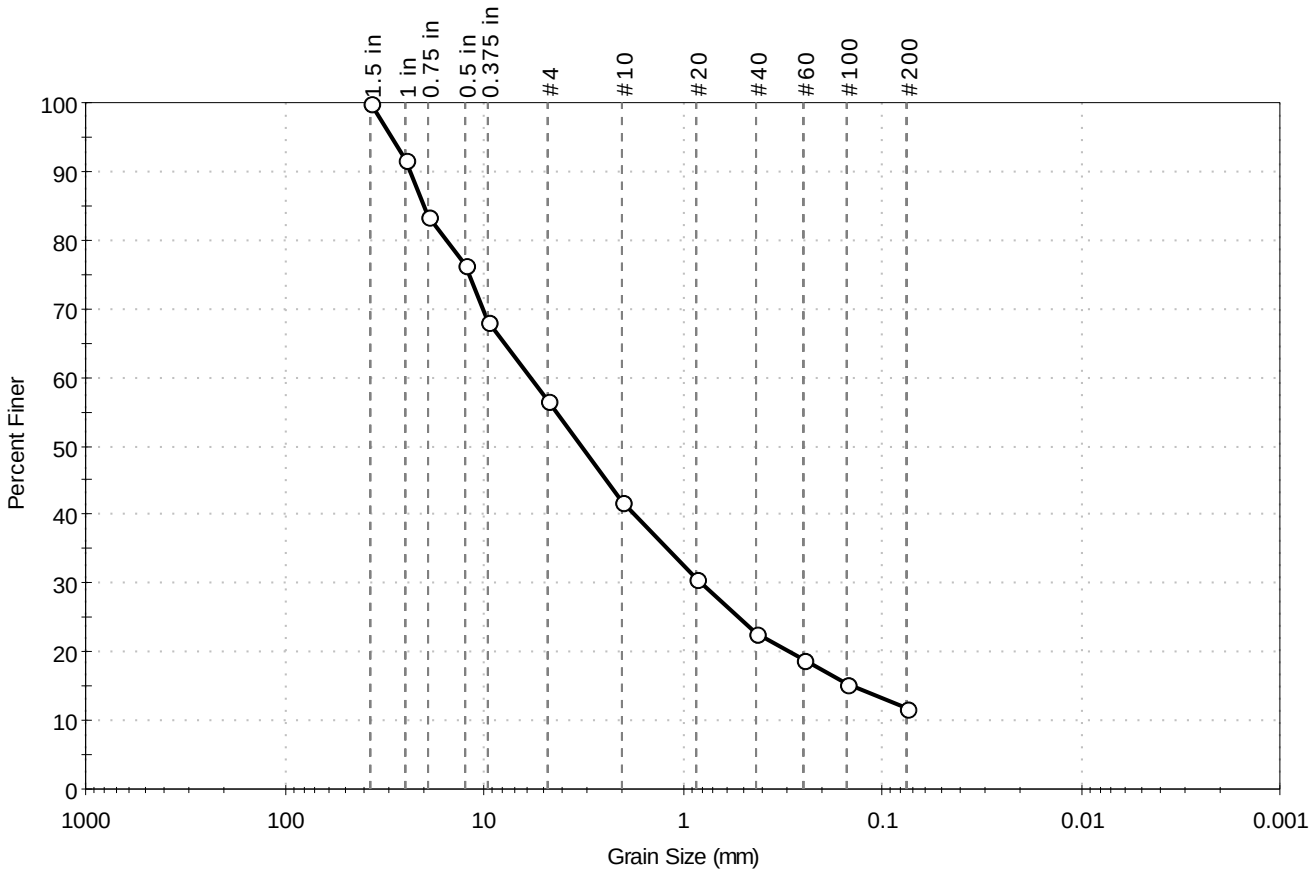
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:50 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-41	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-5	Test Date:	05/29/18	Checked By:	emm
Depth :	8-10	Test Id:	456244		
Test Comment:	---				
Visual Description:	Moist, dark brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	43.2	45.0	11.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	92		
0.75 in	19.00	84		
0.5 in	12.50	77		
0.375 in	9.50	68		
#4	4.75	57		
#10	2.00	42		
#20	0.85	31		
#40	0.42	23		
#60	0.25	19		
#100	0.15	15		
#200	0.075	12		

Coefficients

D_{85} = 19.9511 mm D_{30} = 0.8089 mm

D_{60} = 5.8038 mm D_{15} = 0.1408 mm

D_{50} = 3.2100 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-a (0))

Sample/Test Description

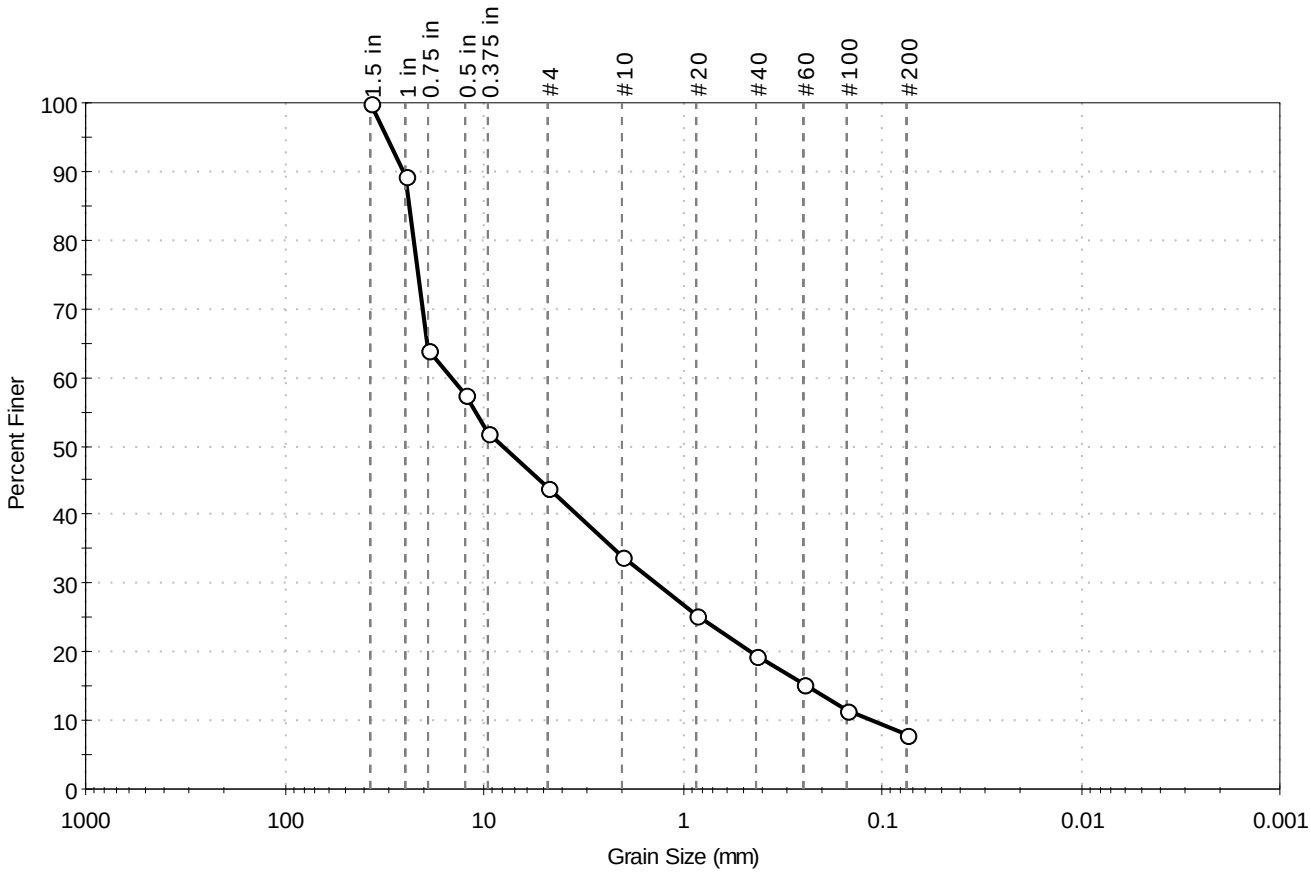
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:50 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-41	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-7	Test Date:	06/14/18	Checked By:	emm
Depth :	12-14	Test Id:	457944		
Test Comment:	---				
Visual Description:	Moist, redish dark gray gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	56.2	35.8	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	89		
0.75 in	19.00	64		
0.5 in	12.50	58		
0.375 in	9.50	52		
#4	4.75	44		
#10	2.00	34		
#20	0.85	25		
#40	0.42	19		
#60	0.25	15		
#100	0.15	12		
#200	0.075	8.0		

Coefficients

D_{85} = 23.8175 mm D_{30} = 1.3494 mm
D_{60} = 14.6163 mm D_{15} = 0.2358 mm
D_{50} = 8.0521 mm D_{10} = 0.1103 mm
C_u = 132.514 C_c = 1.129

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

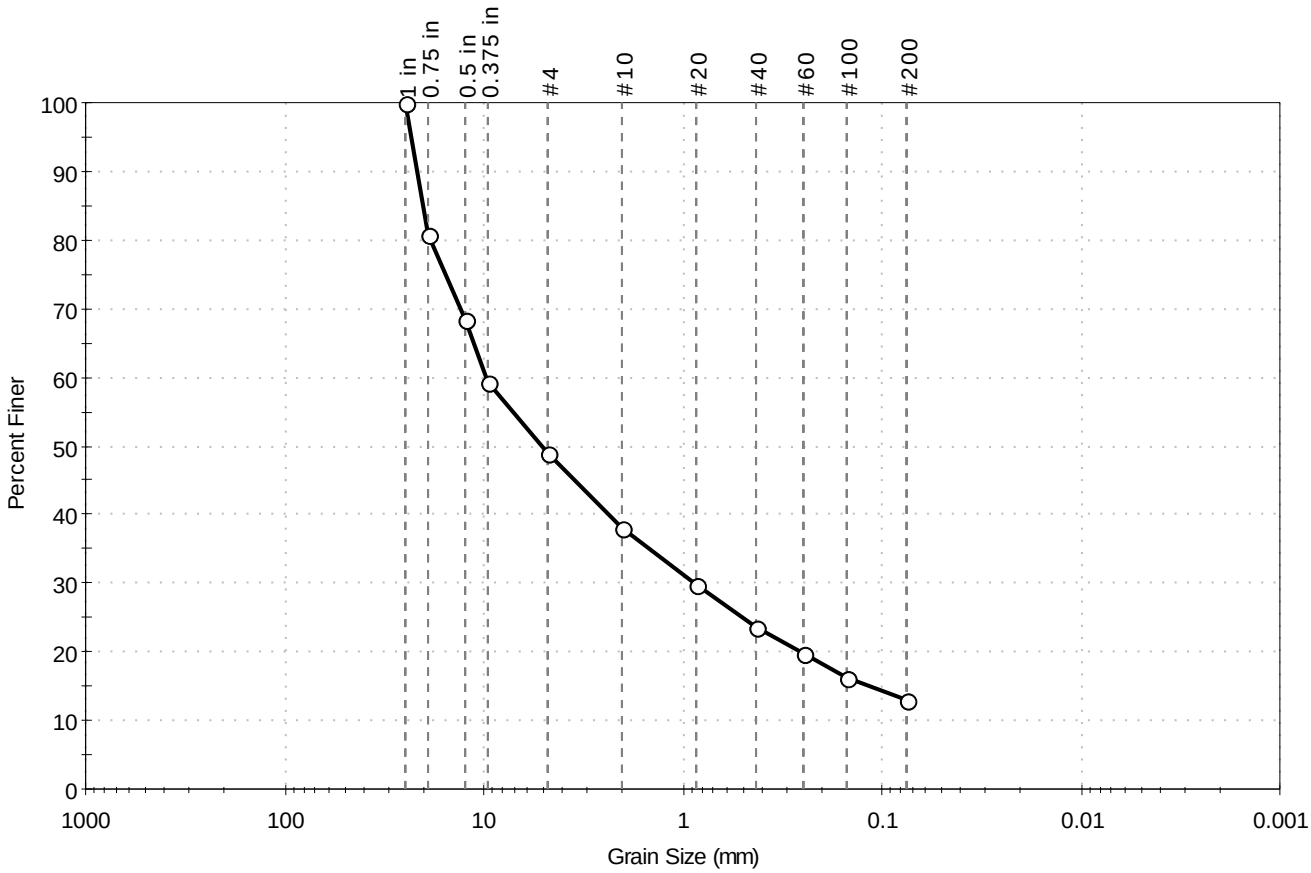
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/2/2018 12:51:26 PM

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-41	Sample Type: jar	Tested By:	jbr
Sample ID: S-9B	Test Date: 05/29/18	Checked By:	emm
Depth : 16-18	Test Id: 456245		
Test Comment:	---		
Visual Description:	Moist, light olive gray silty gravel with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	51.1	36.0	12.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	81		
0.5 in	12.50	68		
0.375 in	9.50	59		
#4	4.75	49		
#10	2.00	38		
#20	0.85	30		
#40	0.42	24		
#60	0.25	20		
#100	0.15	16		
#200	0.075	13		

Coefficients

D_{85} = 20.1677 mm	D_{30} = 0.8700 mm
D_{60} = 9.6751 mm	D_{15} = 0.1153 mm
D_{50} = 5.1114 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-a (0))

Sample/Test Description

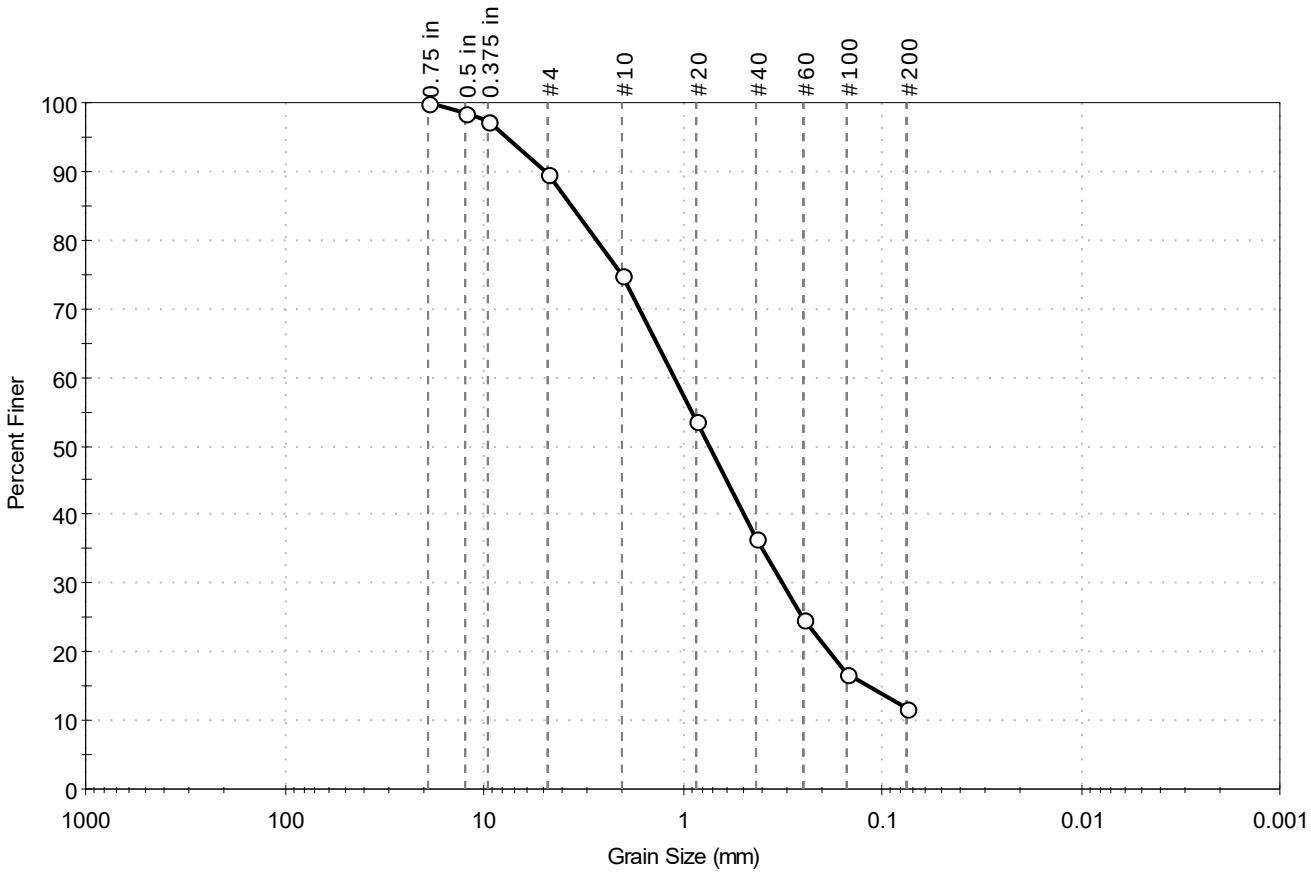
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:50 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-45	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-2	Test Date:	05/31/19	Checked By:	bfs
Depth :	2-4	Test Id:	505998		
Test Comment:	---				
Visual Description:	Moist, grayish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	10.3	78.0	11.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	99		
0.375 in	9.50	97		
#4	4.75	90		
#10	2.00	75		
#20	0.85	54		
#40	0.42	36		
#60	0.25	25		
#100	0.15	17		
#200	0.075	12		

Coefficients

D_{85} = 3.5991 mm D_{30} = 0.3170 mm

D_{60} = 1.0926 mm D_{15} = 0.1165 mm

D_{50} = 0.7310 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

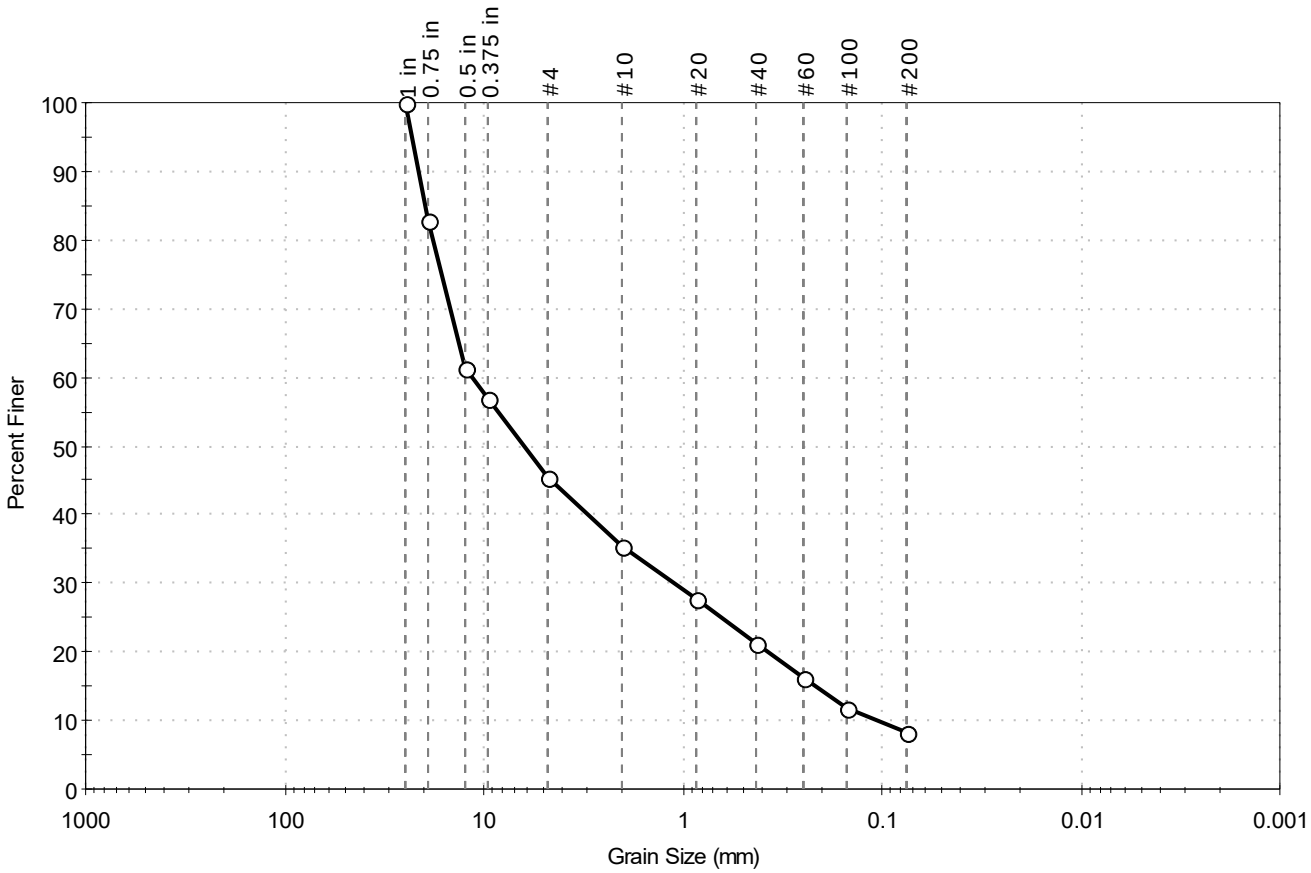
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/7/2019 9:59:05 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-45	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-7	Test Date:	05/31/19	Checked By:	bfs
Depth :	12-14	Test Id:	505999		
Test Comment:	---				
Visual Description:	Moist, dark yellowish brown gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	54.7	36.9	8.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	83		
0.5 in	12.50	61		
0.375 in	9.50	57		
#4	4.75	45		
#10	2.00	35		
#20	0.85	28		
#40	0.42	21		
#60	0.25	16		
#100	0.15	12		
#200	0.075	8.4		

Coefficients

D_{85} = 19.6743 mm	D_{30} = 1.1015 mm
D_{60} = 11.5270 mm	D_{15} = 0.2196 mm
D_{50} = 6.2553 mm	D_{10} = 0.1052 mm
C_u = 109.572	C_c = 1.001

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

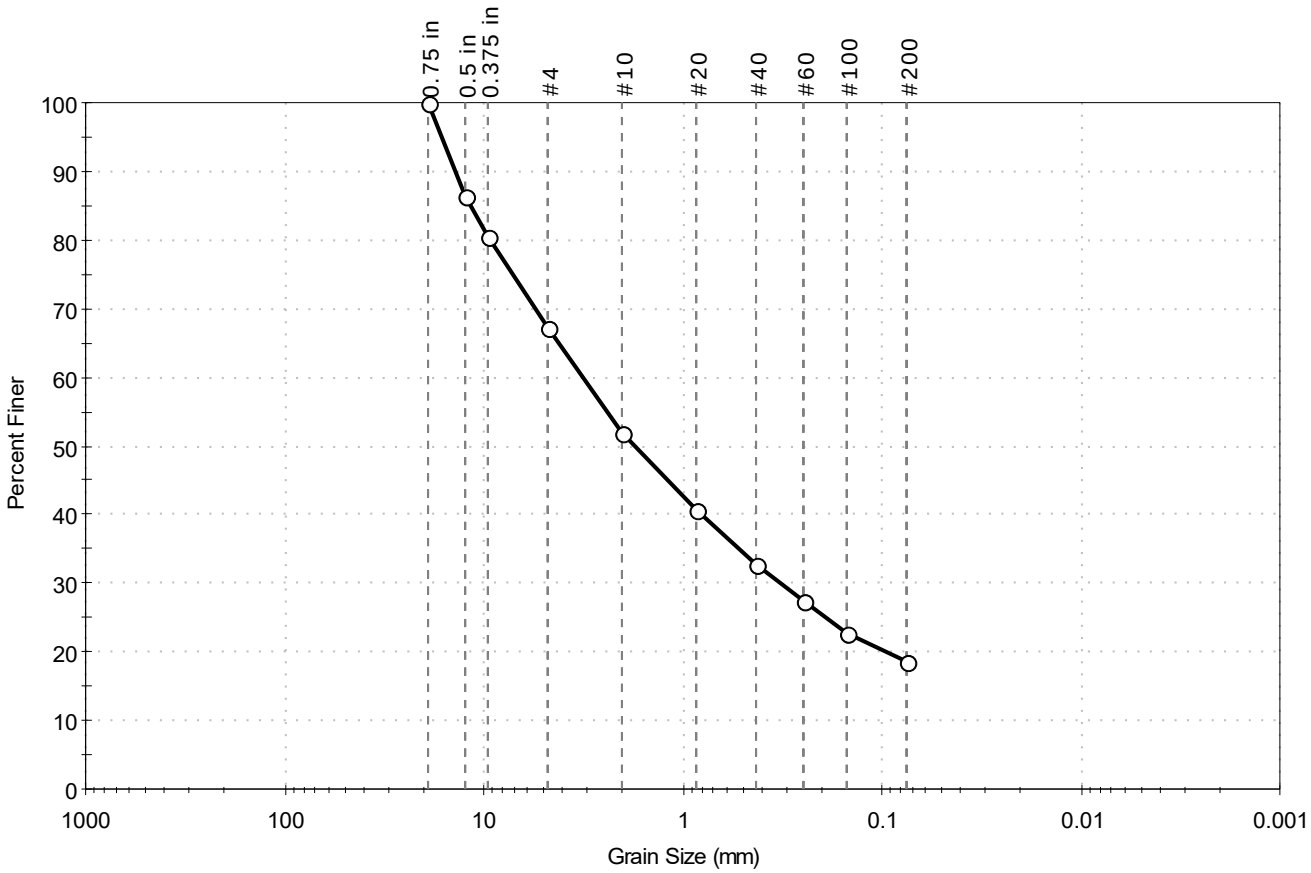
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/7/2019 9:59:05 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-45	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-12 (2 jars)	Test Date:	05/31/19	Checked By:	bfs
Depth :	22-24	Test Id:	506000		
Test Comment:	---				
Visual Description:	Moist, yellowish brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	32.7	48.8	18.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	86		
0.375 in	9.50	81		
#4	4.75	67		
#10	2.00	52		
#20	0.85	41		
#40	0.42	33		
#60	0.25	27		
#100	0.15	23		
#200	0.075	18		

Coefficients

D_{85} = 11.6864 mm D_{30} = 0.3230 mm

D_{60} = 3.1512 mm D_{15} = N/A

D_{50} = 1.7279 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

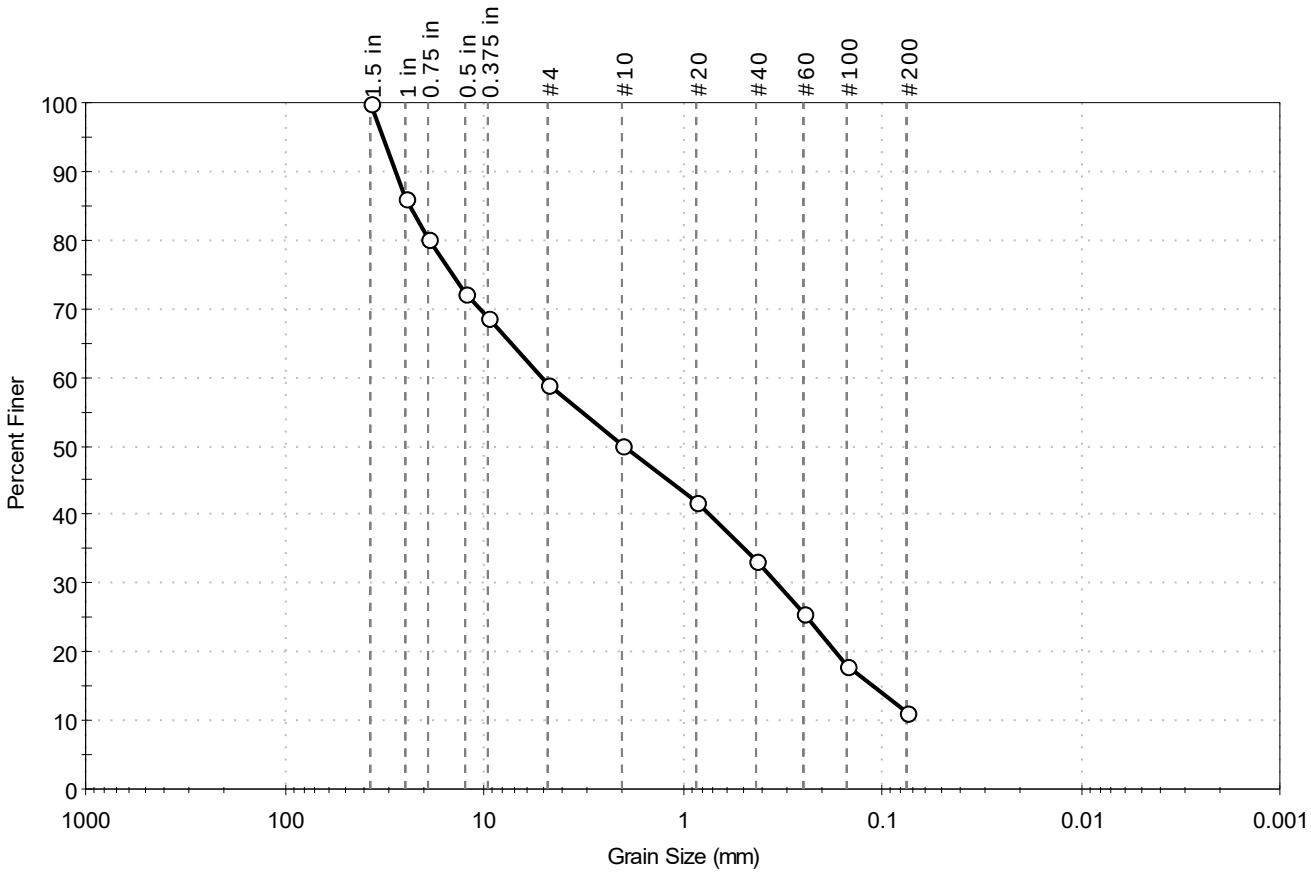
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/7/2019 9:59:06 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-46A	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-4	Test Date:	05/31/19	Checked By:	bfs
Depth :	11-13	Test Id:	506001		
Test Comment:	---				
Visual Description:	Moist, yellowish brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	41.0	47.9	11.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	86		
0.75 in	19.00	80		
0.5 in	12.50	72		
0.375 in	9.50	69		
#4	4.75	59		
#10	2.00	50		
#20	0.85	42		
#40	0.42	33		
#60	0.25	26		
#100	0.15	18		
#200	0.075	11		

Coefficients

D_{85} = 23.7257 mm D_{30} = 0.3383 mm
D_{60} = 5.0952 mm D_{15} = 0.1108 mm
D_{50} = 1.9779 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

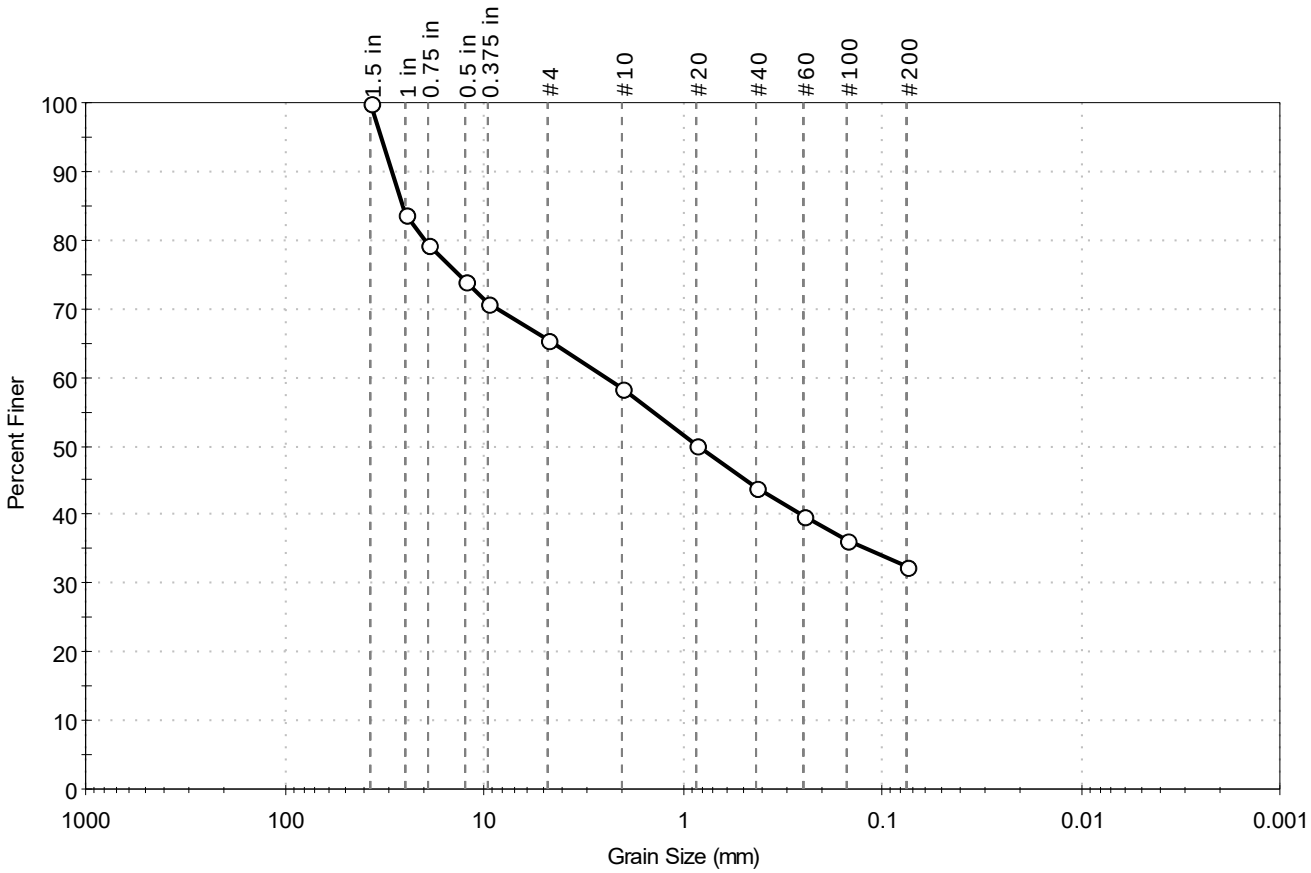
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/7/2019 9:59:06 AM

Client:	Pare Corporation				
Project:	NBC Phase III CSO CER				
Location:	Pawtucket, RI			Project No:	GTX-308335
Boring ID:	B17-46A	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-7 (2 jars)	Test Date:	05/31/19	Checked By:	bfs
Depth :	17-19	Test Id:	506002		
Test Comment:	---				
Visual Description:	Moist, yellowish brown silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	34.6	32.9	32.5

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	79		
0.5 in	12.50	74		
0.375 in	9.50	71		
#4	4.75	65		
#10	2.00	58		
#20	0.85	50		
#40	0.42	44		
#60	0.25	40		
#100	0.15	36		
#200	0.075	33		

Coefficients

D_{85} = 25.8103 mm D_{30} = N/A
D_{60} = 2.4632 mm D_{15} = N/A
D_{50} = 0.8247 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

printed 6/7/2019 9:59:07 AM

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-8	Sample Type: cylinder	Tested By:	smd
Sample ID: ---	Test Date: 06/22/18	Checked By:	jsc
Depth : 28.0-28.8 ft	Test Id: 459781		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-45	28.52-28.61 ft	2.40	1.02	288	3.11	1.76	*	0.952	*	19	*

Before

After

Discontinuity Failure

* Invalid Test - Specimen did not fail from point to point.

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-8	Sample Type: cylinder	Tested By:	smd
Sample ID: ---	Test Date: 06/22/18	Checked By:	jsc
Depth : 35.7-36.8 ft	Test Id: 459813		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-46	35.73-35.82 ft	2.40	1.01	3,154	3.08	1.75	*	0.949	*	18	*

Before

After

Discontinuity Failure

* Invalid Test - Specimen did not fail from point to point.

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-8	Sample Type: cylinder	Tested By:	smd
Sample ID: ---	Test Date: 06/22/18	Checked By:	jsc
Depth : 35.7-36.8 ft	Test Id: 459782		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-47	35.83-36.92 ft	2.40	1.00	2,887	3.06	1.75	944	0.948	895	18	17,000

Before

After

Discontinuity Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

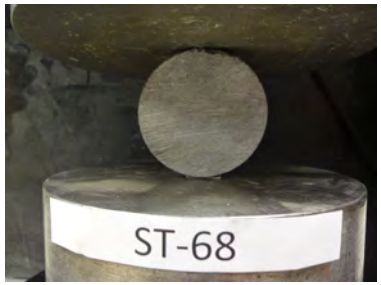
F = the size correction factor

Is(50) = the size corrected point load strength index

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-39	Sample Type: cylinder	Tested By:	tlm
Sample ID: ---	Test Date: 09/16/19	Checked By:	smd
Depth : 39.3-40.8	Test Id: 519883		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
40.02 - 40.12 ft	ST-68	1.13	2.41	0.47	871	204	3



Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

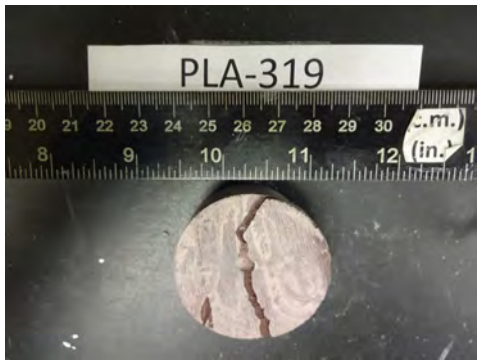
Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-45	Sample Type: tube	Tested By:	tlm
Sample ID: ---	Test Date: 06/07/19	Checked By:	smd
Depth : 29-29.4	Test Id: 506047		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm) psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-319	29.0 - 29.4 ft	1.99	1.08	866	2.74	1.66	316	0.925	292	19	6,000

Before



After

Intact material and Discontinuity Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

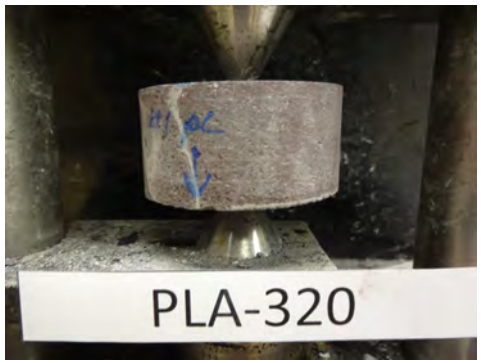
F = the size correction factor

Is(50) = the size corrected point load strength index

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-45	Sample Type: tube	Tested By:	tlm
Sample ID: ---	Test Date: 06/07/19	Checked By:	smd
Depth : 29.4-30	Test Id: 506048		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm) psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-320	29.81 - 29.89 ft	1.99	1.01	1,097	2.54	1.60	431	0.910	392	18	7,760



Before

After

Intact material and Discontinuity Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-45	Sample Type: tube	Tested By:	tlm
Sample ID: ---	Test Date: 06/07/19	Checked By:	smd
Depth : 42.4-43.4	Test Id: 506049		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm) psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-321	42.83 - 42.92 ft	1.99	1.08	461	2.74	1.66	168	0.925	155	19	3,190

Before

After

Intact material and Discontinuity Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

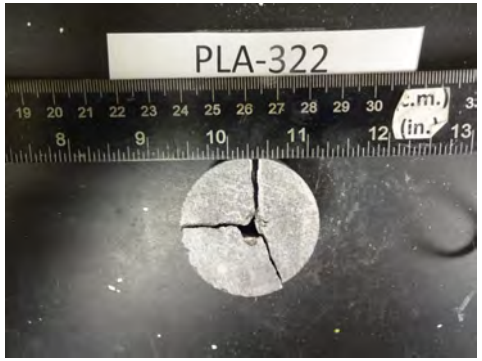
Is(50) = the size corrected point load strength index

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-45	Sample Type: tube	Tested By:	tlm
Sample ID: ---	Test Date: 06/07/19	Checked By:	smd
Depth : 42.4-43.4	Test Id: 506076		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm) psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-322	42.93 - 43.01 ft	1.99	1.03	3,138	2.62	1.62	1199	0.915	1098	19	22,800

Before



After

Intact Material Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	---	Sample Type:	---	Tested By:	pas
Sample ID:	---	Test Date:	06/29/18	Checked By:	jsc
Depth :	---	Test Id:	459770		

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
B17-8	---	28.07-28.51ft	176	3511	2	Yes	---
B17-8	---	77.90-78.34ft	172	8759	2	Yes	---
B17-8	---	104.90-105.32 ft	168	15603	1	Yes	---
B17-8	---	132.01-132.43 ft	171	12909	1	Yes	---
B17-8	---	151.31-151.74 ft	170	2500	2	Yes	---
B17-8	---	159.45-159.88 ft	169	10800	1	Yes	---
B17-8	---	174.11-174.55 ft	170	3947	2	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	Pare Corpoartion	Test Date:	6/26/2018
Project Name:	NBC Phase III- Sewer Overflow	Tested By:	meo/trm
Project Location:	Pawtucket, RI	Checked By:	jsc
GTX #:	307508		
Boring ID:	B17-8		
Sample ID:	---		
Depth:	28.07-28.51 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.75	4.75	4.75
Specimen Diameter, in:	2.40	2.40	2.40
Specimen Mass, g:	993.22		
Bulk Density, lb/ft^3	176	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.0	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? YES

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010

Difference between max and min readings, in:

0° = 0.00020 90° = 0.00010

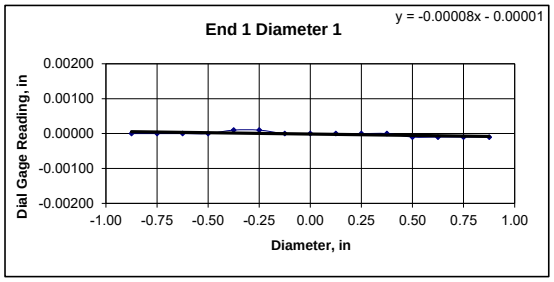
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00020
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000	0.00000	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000

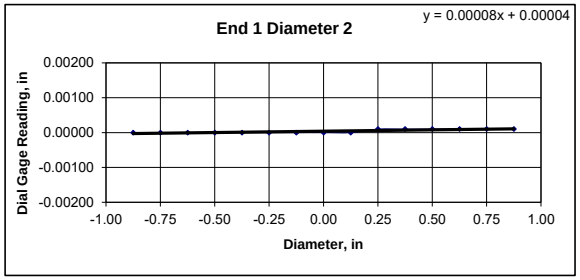
Difference between max and min readings, in:

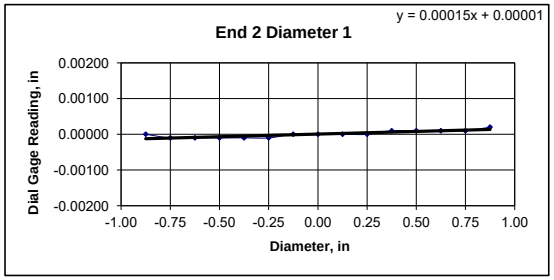
0° = 0.0003 90° = 0.0002

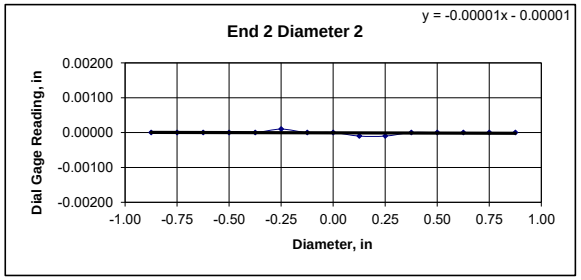
Maximum difference must be < 0.0020 in. Difference = ± 0.00015

Flatness Tolerance Met? YES









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00008
Angle of Best Fit Line:	0.00442

End 2:

Slope of Best Fit Line	0.00015
Angle of Best Fit Line:	0.00851

Maximum Angular Difference: 0.00409

Parallelism Tolerance Met? YES

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00008
Angle of Best Fit Line:	0.00442

End 2:

Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00082

Maximum Angular Difference: 0.00360

Parallelism Tolerance Met? YES

Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00020	2.400	0.00008	0.005	YES
Diameter 2, in (rotated 90°)	0.00010	2.400	0.00004	0.002	YES
END 2					
Diameter 1, in	0.00030	2.400	0.00013	0.007	YES
Diameter 2, in (rotated 90°)	0.00020	2.400	0.00008	0.005	YES

Maximum angle of departure must be ≤ 0.25°

Perpendicularity Tolerance Met? YES

Client:	Pare Corpoartion
Project Name:	NBC Phase III- Sewer Overflow
Project Location:	Pawtucket, RI
GTX #:	307508
Test Date:	6/26/2018
Tested By:	trm
Checked By:	jsc
Boring ID:	B17-8
Sample ID:	---
Depth, ft:	28.07-28.51

After cutting and grinding

After break

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	---	Sample Type:	---	Tested By:	tlm
Sample ID:	---	Test Date:	09/05/19	Checked By:	smd
Depth :	---	Test Id:	519892		

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
B17-39	---	28.0 - 28.45 ft	174	2865	2	Yes	---
B17-39	---	39.56 - 40.01 ft	180	6377	2	Yes	---
B17-39	---	52.0-52.45 ft.	174	4911	1	Yes	---
B17-39	---	69.71 - 70.16 ft	165	7599	2	Yes	---
B17-39	---	94.63 - 95.08 ft	167	5963	2	Yes	---
B17-39	---	111.74 - 112.19 ft	174	9335	3	Yes	---
B17-39	---	137.59 - 138.04 ft	167	13706	3	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-39	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	---	Test Date:	09/05/19	Checked By:	smd
Depth :	167-167.7	Test Id:	519893		
Test Comment:	---				
Visual Description:	See photograph(s)				
Sample Comment:	---				

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
B17-39	---	167.18 - 167.63 ft	169	10824	3	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

printed 9/16/2019 10:09:56 AM

Client:	Pare Corporation	Test Date:	9/4/2019
Project Name:	NBC Phase III -Sewer Overflow	Tested By:	jck
Project Location:	Pawtucket, RI	Checked By:	smd
GTX #:	307508		
Boring ID:	B17-39		
Sample ID:	---		
Depth:	28.0-28.45 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	5.33	5.33	5.33
Specimen Diameter, in:	2.40	2.40	2.40
Specimen Mass, g:	1104.85		
Bulk Density, lb/ft^3	174	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00030	-0.00020	-0.00020	-0.00020	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Difference between max and min readings, in:

0° = 0.00030 90° = 0.00030

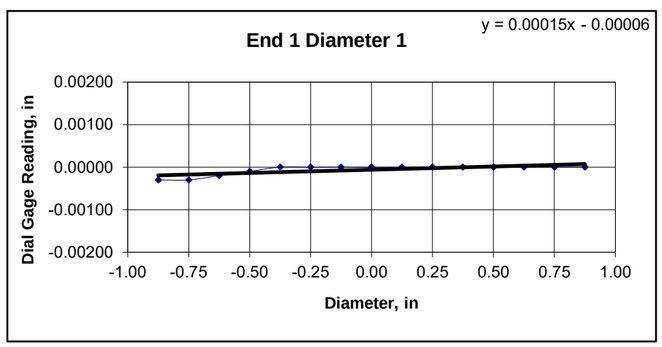
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00030	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

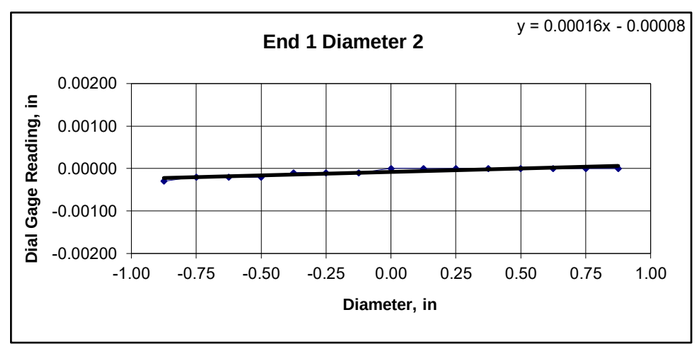
Difference between max and min readings, in:

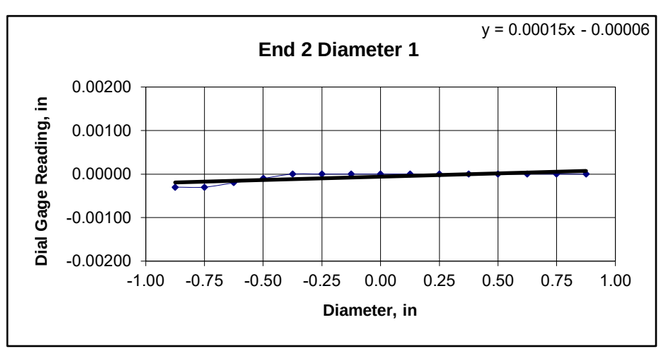
0° = 0.0003 90° = 0.0003

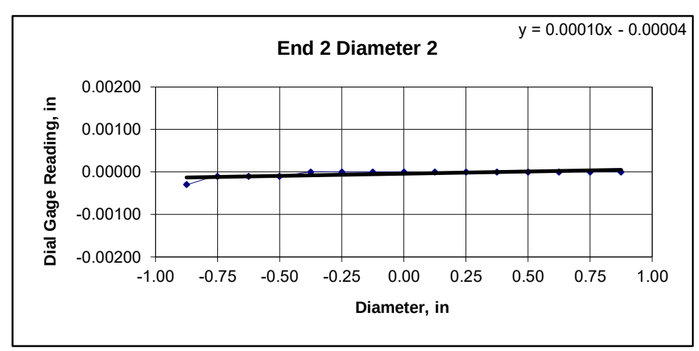
Maximum difference must be < 0.0020 in. Difference = ± 0.00015

Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00015
Angle of Best Fit Line:	0.00868

End 2:

Slope of Best Fit Line	0.00015
Angle of Best Fit Line:	0.00868

Maximum Angular Difference: 0.00000

Parallelism Tolerance Met? **YES**

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00016
Angle of Best Fit Line:	0.00933

End 2:

Slope of Best Fit Line	0.00010
Angle of Best Fit Line:	0.00589

Maximum Angular Difference: 0.00344

Parallelism Tolerance Met? **YES**

Spherically Seated

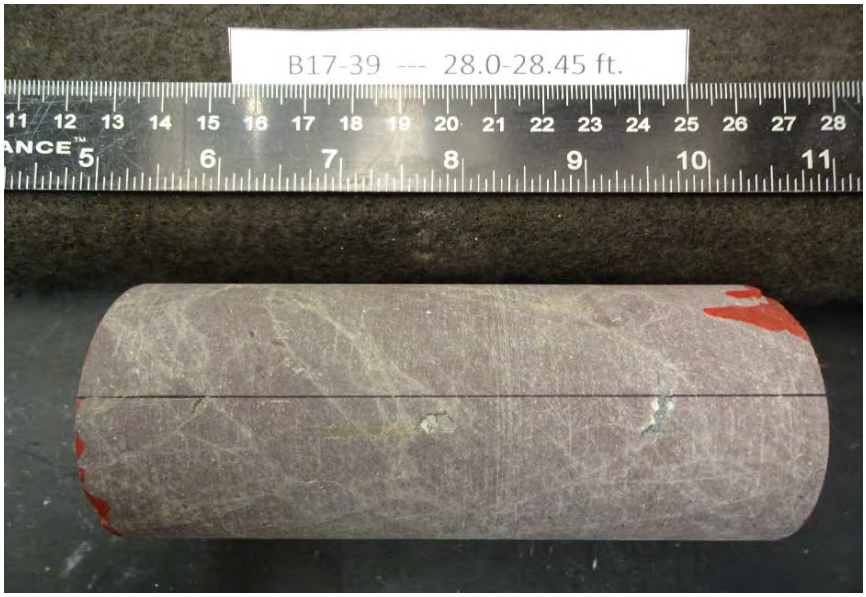
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00030	2.400	0.00013	0.007	YES
Diameter 2, in (rotated 90°)	0.00030	2.400	0.00013	0.007	YES
END 2					
Diameter 1, in	0.00030	2.400	0.00013	0.007	YES
Diameter 2, in (rotated 90°)	0.00030	2.400	0.00013	0.007	YES

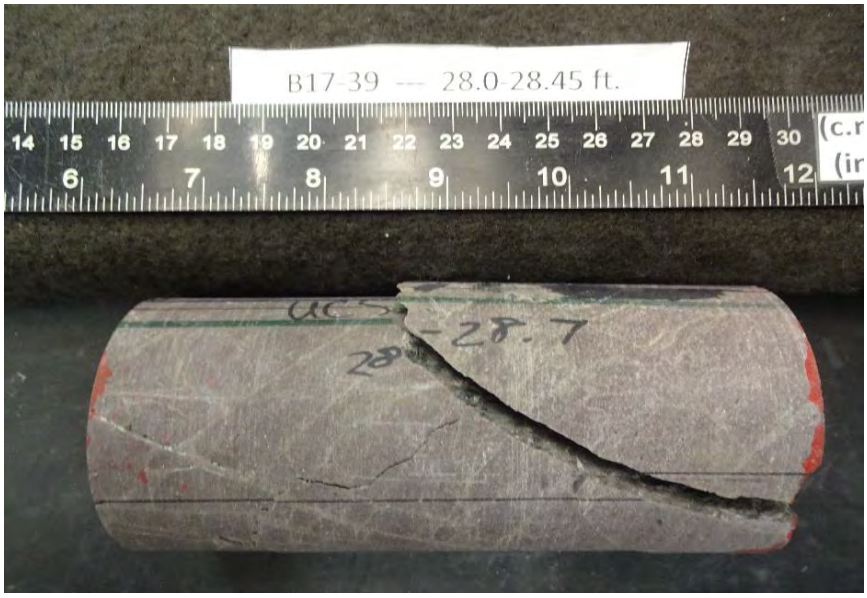
Maximum angle of departure must be ≤ 0.25°

Perpendicularity Tolerance Met? **YES**

Client:	Pare Corporation
Project Name:	NBC Phase III -Sewer Overflow
Project Location:	Pawtucket, RI
GTX #:	307508
Test Date:	9/4/2019
Tested By:	jck
Checked By:	smd
Boring ID:	B17-39
Sample ID:	---
Depth, ft:	28.0-28.45



After cutting and grinding



After break

Client:	Pare Corporation	Test Date:	9/4/2019
Project Name:	NBC Phase III -Sewer Overflow	Tested By:	jck
Project Location:	Pawtucket, RI	Checked By:	smd
GTX #:	307508		
Boring ID:	B17-39		
Sample ID:	---		
Depth:	39.56-40.01 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	5.45	5.45	5.45
Specimen Diameter, in:	2.40	2.41	2.41
Specimen Mass, g:	1169.39		
Bulk Density, lb/ft^3	180	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.3	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00020	0.00020	0.00010
Diameter 2, in (rotated 90°)	-0.00030	-0.00030	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Difference between max and min readings, in:

0° = 0.00050 90° = 0.00030

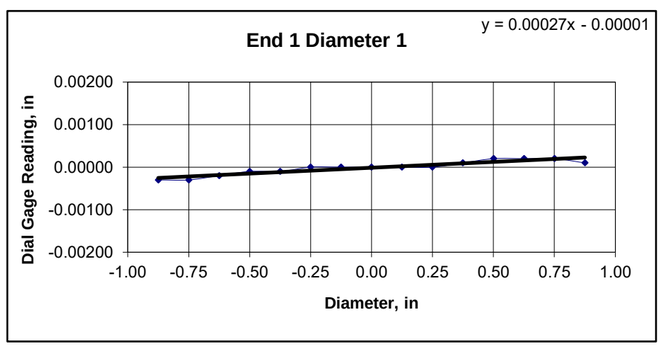
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00020	0.00010
Diameter 2, in (rotated 90°)	-0.00030	-0.00030	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

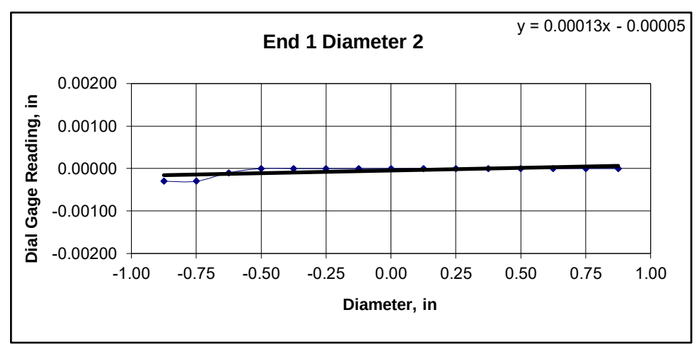
Difference between max and min readings, in:

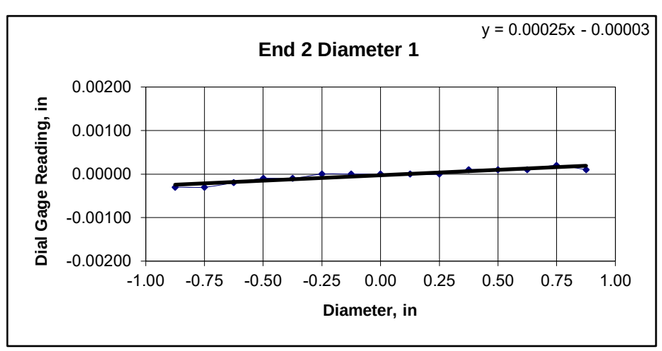
0° = 0.0005 90° = 0.0003

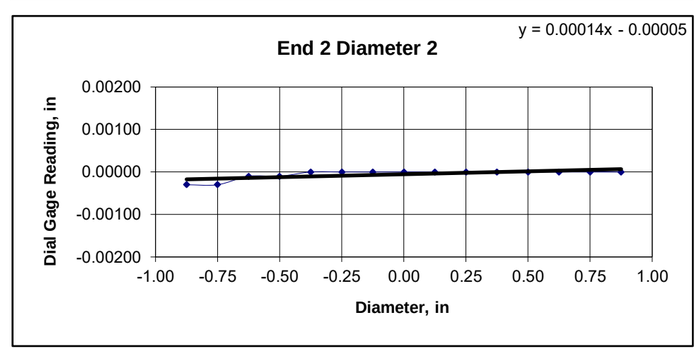
Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00025

Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:

Slope of Best Fit Line 0.00027

Angle of Best Fit Line: 0.01572

End 2:

Slope of Best Fit Line 0.00025

Angle of Best Fit Line: 0.01424

Maximum Angular Difference: 0.00147

Parallelism Tolerance Met? **YES**

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line 0.00013

Angle of Best Fit Line: 0.00720

End 2:

Slope of Best Fit Line 0.00014

Angle of Best Fit Line: 0.00786

Maximum Angular Difference: 0.00065

Parallelism Tolerance Met? **YES**

Spherically Seated

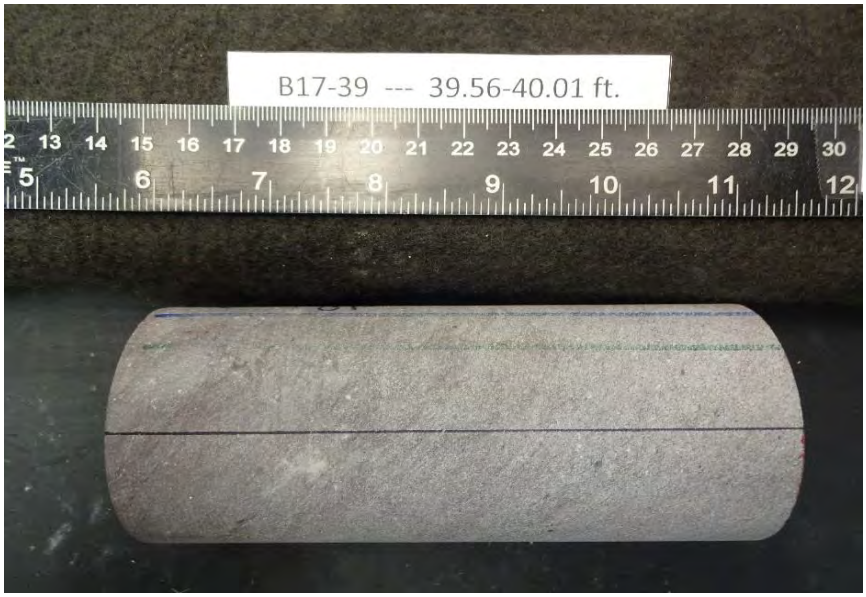
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00050	2.405	0.00021	0.012	YES
Diameter 2, in (rotated 90°)	0.00030	2.405	0.00012	0.007	YES
END 2					
Diameter 1, in	0.00050	2.405	0.00021	0.012	YES
Diameter 2, in (rotated 90°)	0.00030	2.405	0.00012	0.007	YES

Maximum angle of departure must be $\leq$ 0.25°

Perpendicularity Tolerance Met? **YES**

Client:	Pare Corporation
Project Name:	NBC Phase III -Sewer Overflow
Project Location:	Pawtucket, RI
GTX #:	307508
Test Date:	9/4/2019
Tested By:	jck
Checked By:	smd
Boring ID:	B17-39
Sample ID:	---
Depth, ft:	39.56-40.01



After cutting and grinding

After break

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	---	Sample Type:	---	Tested By:	tlm
Sample ID:	---	Test Date:	06/12/19	Checked By:	smd
Depth :	---	Test Id:	506118		

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
B17-45	---	30.37 - 30.73 ft	173	4565	2	Yes	---
B17-45	---	42.49 - 42.82 ft	172	5692	1	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	Pare Corporation	Test Date:	6/19/2019
Project Name:	NBC Phase III -Sewer Overflow	Tested By:	jck
Project Location:	Pawtucket, RI	Checked By:	jsc
GTX #:	307508		
Boring ID:	B17-45		
Sample ID:	---		
Depth:	30.37-30.73 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	3.97	3.96	3.97
Specimen Diameter, in:	1.98	1.99	1.99
Specimen Mass, g:	556.89		
Bulk Density, lb/ft^3	173	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.0	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00030	0.00030	0.00030	0.00020	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00020	-0.00030	-0.00040	-0.00040
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00010	0.00000	0.00000	0.00000	0.00000

Difference between max and min readings, in:

0° = 0.00070 90° = 0.00020

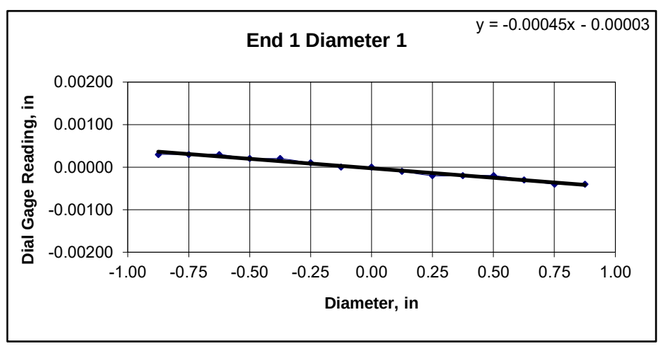
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00030	0.00030	0.00030	0.00020	0.00020	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00040	-0.00050
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	0.00000	0.00000	0.00000	0.00000

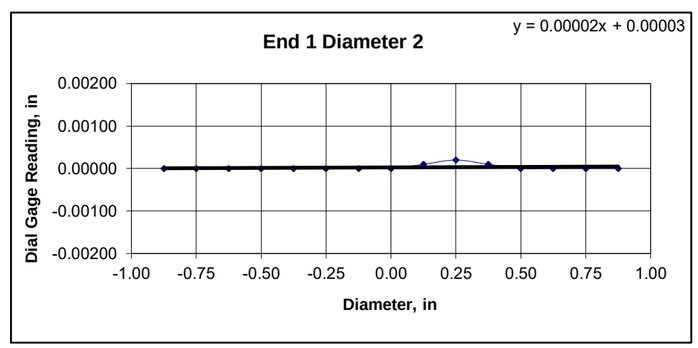
Difference between max and min readings, in:

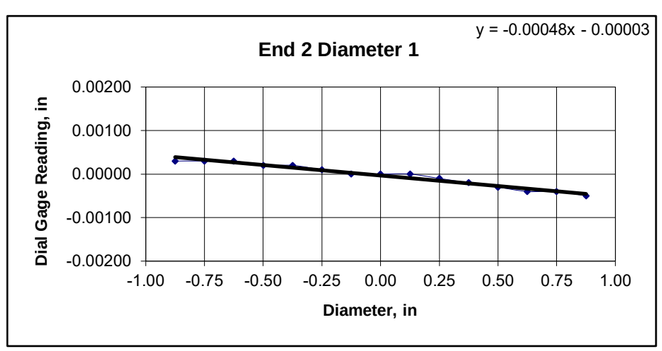
0° = 0.0008 90° = 0.0001

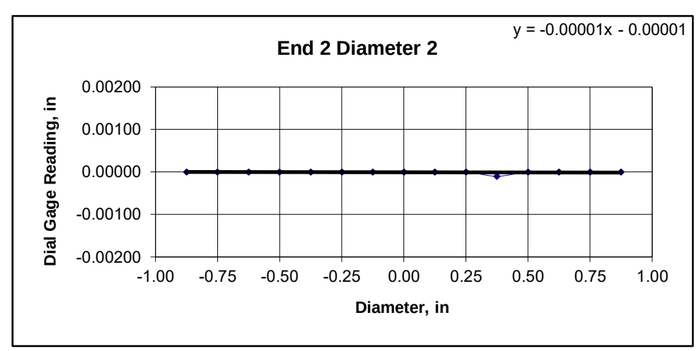
Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00040

Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00045
Angle of Best Fit Line:	0.02554

End 2:

Slope of Best Fit Line	0.00048
Angle of Best Fit Line:	0.02767

Maximum Angular Difference: 0.00213

Parallelism Tolerance Met? **YES**

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00002
Angle of Best Fit Line:	0.00131

End 2:

Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00049

Maximum Angular Difference: 0.00082

Parallelism Tolerance Met? **YES**

Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

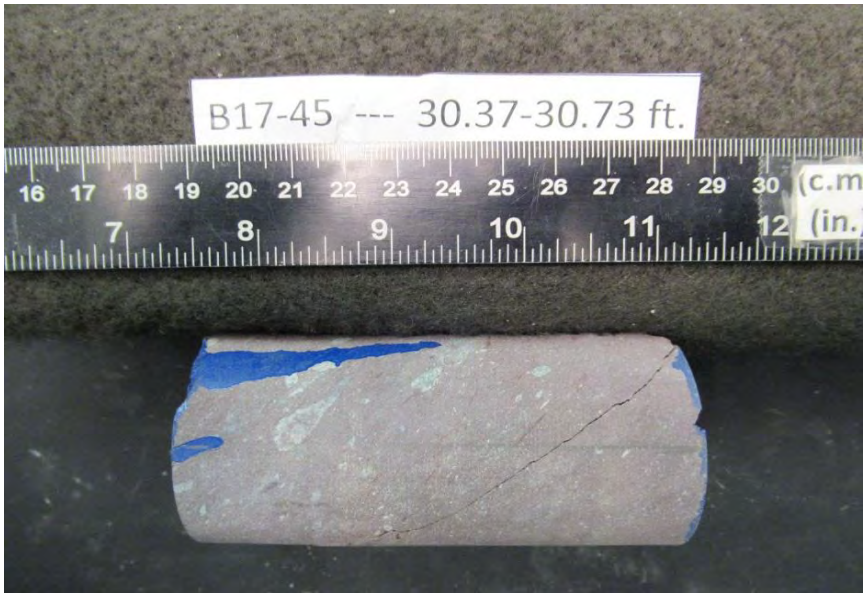
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00070	1.985	0.00035	0.020	YES
Diameter 2, in (rotated 90°)	0.00020	1.985	0.00010	0.006	YES
END 2					
Diameter 1, in	0.00080	1.985	0.00040	0.023	YES
Diameter 2, in (rotated 90°)	0.00010	1.985	0.00005	0.003	YES

Maximum angle of departure must be $\leq$ 0.25°

Perpendicularity Tolerance Met? **YES**

Client:	Pare Corporation
Project Name:	NBC Phase III -Sewer Overflow
Project Location:	Pawtucket, RI
GTX #:	307508
Test Date:	6/18/2019
Tested By:	jck
Checked By:	jsc
Boring ID:	B17-45
Sample ID:	---
Depth, ft:	30.37-30.73

After cutting and grinding



After break

Client:	Pare Corporation	Test Date:	6/6/2019
Project Name:	NBC Phase III -Sewer Overflow	Tested By:	cmh
Project Location:	Pawtucket, RI	Checked By:	jsc
GTX #:	307508		
Boring ID:	B17-45		
Sample ID:	---		
Depth:	42.49-42.82 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	3.91	3.91	3.91
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	546.03		
Bulk Density, lb/ft^3	172	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.0	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00050	0.00050	0.00040	0.00030	0.00020	0.00000	0.00000	0.00000	-0.00020	-0.00030	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00020	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020	0.00020	0.00020	0.00020	0.00020

Difference between max and min readings, in:

0° = 0.00120 90° = 0.00040

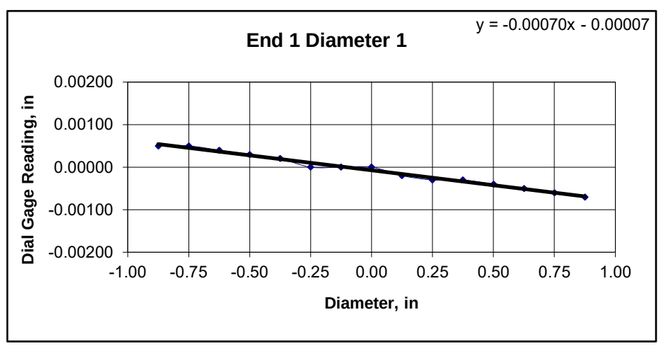
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00060	0.00060	0.00050	0.00040	0.00020	0.00010	0.00010	0.00000	-0.00020	-0.00020	-0.00020	-0.00020	-0.00030	-0.00040	-0.00060
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00020	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00000	0.00000	0.00010	0.00020	0.00020

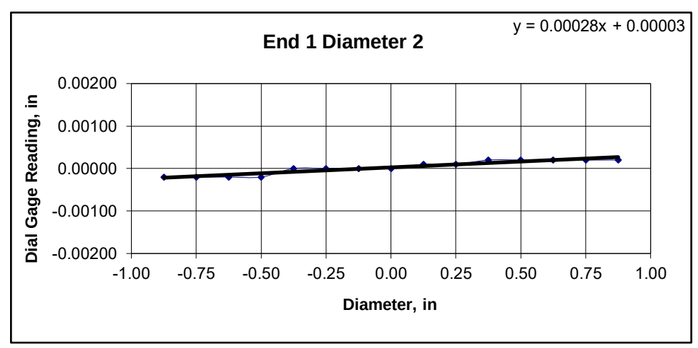
Difference between max and min readings, in:

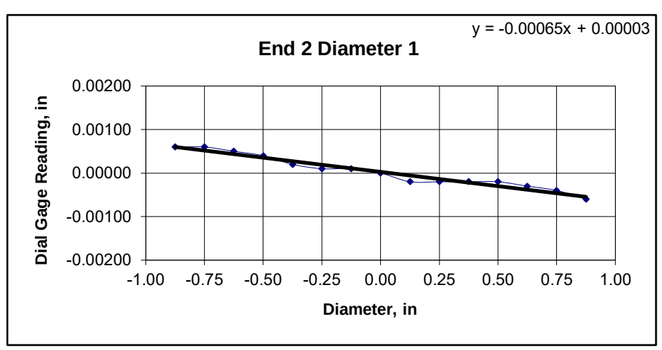
0° = 0.0012 90° = 0.0004

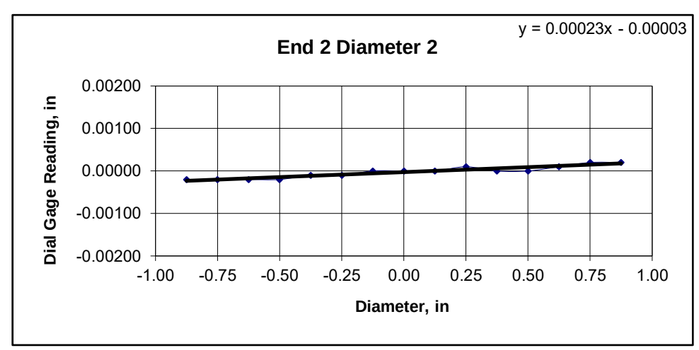
Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00060

Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00070
Angle of Best Fit Line:	0.04027

End 2:

Slope of Best Fit Line	0.00065
Angle of Best Fit Line:	0.03749

Maximum Angular Difference: 0.00278

Parallelism Tolerance Met? **YES**

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00028
Angle of Best Fit Line:	0.01588

End 2:

Slope of Best Fit Line	0.00023
Angle of Best Fit Line:	0.01342

Maximum Angular Difference: 0.00246

Parallelism Tolerance Met? **YES**

Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

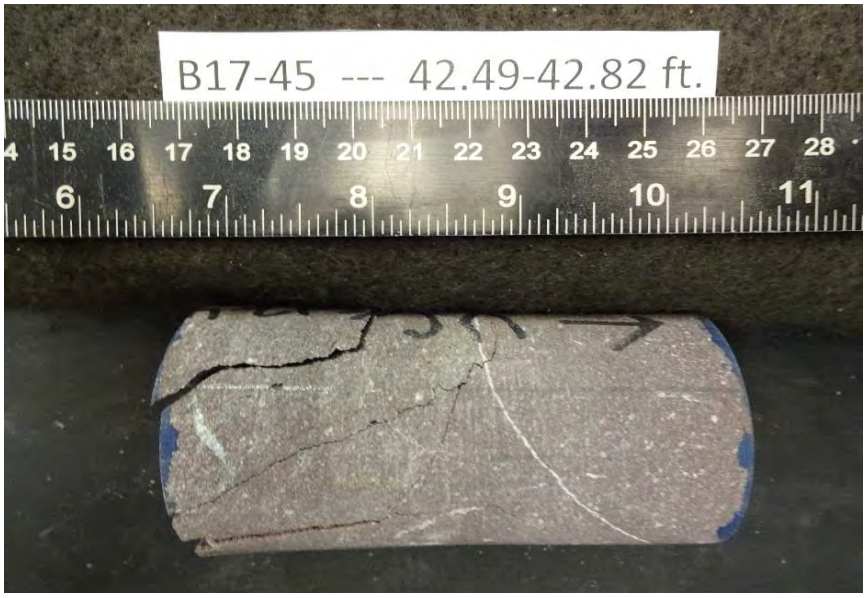
Maximum angle of departure must be $\leq$ 0.25°

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00120	1.980	0.00061	0.035	YES
Diameter 2, in (rotated 90°)	0.00040	1.980	0.00020	0.012	YES
END 2					
Diameter 1, in	0.00120	1.980	0.00061	0.035	YES
Diameter 2, in (rotated 90°)	0.00040	1.980	0.00020	0.012	YES

Perpendicularity Tolerance Met? **YES**

Client:	Pare Corporation
Project Name:	NBC Phase III -Sewer Overflow
Project Location:	Pawtucket, RI
GTX #:	307508
Test Date:	6/10/2019
Tested By:	jck
Checked By:	jsc
Boring ID:	B17-45
Sample ID:	---
Depth, ft:	42.49-42.82

After cutting and grinding

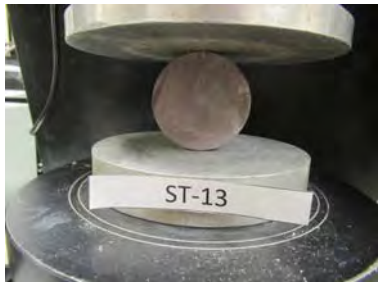


After break

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-8	Sample Type:	cylinder	Tested By:	smd
Sample ID:	---	Test Date:	06/28/18	Checked By:	jsc
Depth :	46.6-47.3 ft	Test Id:	459777		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
47.11-47.20 ft	St-13	1.02	2.40	0.42	5,229	1,370	2



Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

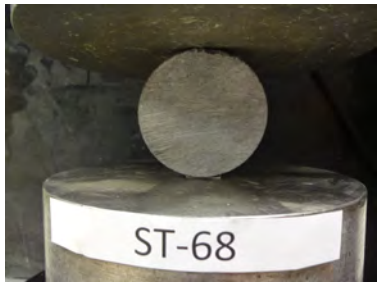
The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-39	Sample Type: cylinder	Tested By:	tlm
Sample ID: ---	Test Date: 09/16/19	Checked By:	smd
Depth : 39.3-40.8	Test Id: 519883		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
40.02 - 40.12 ft	ST-68	1.13	2.41	0.47	871	204	3



Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

HAGER-RICHTER
GEOSCIENCE, INC.

SEISMIC REFRACTION SURVEY
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW PROJECT
PAWTUCKET MAIN TUNNEL SECTION
PAWTUCKET, RHODE ISLAND

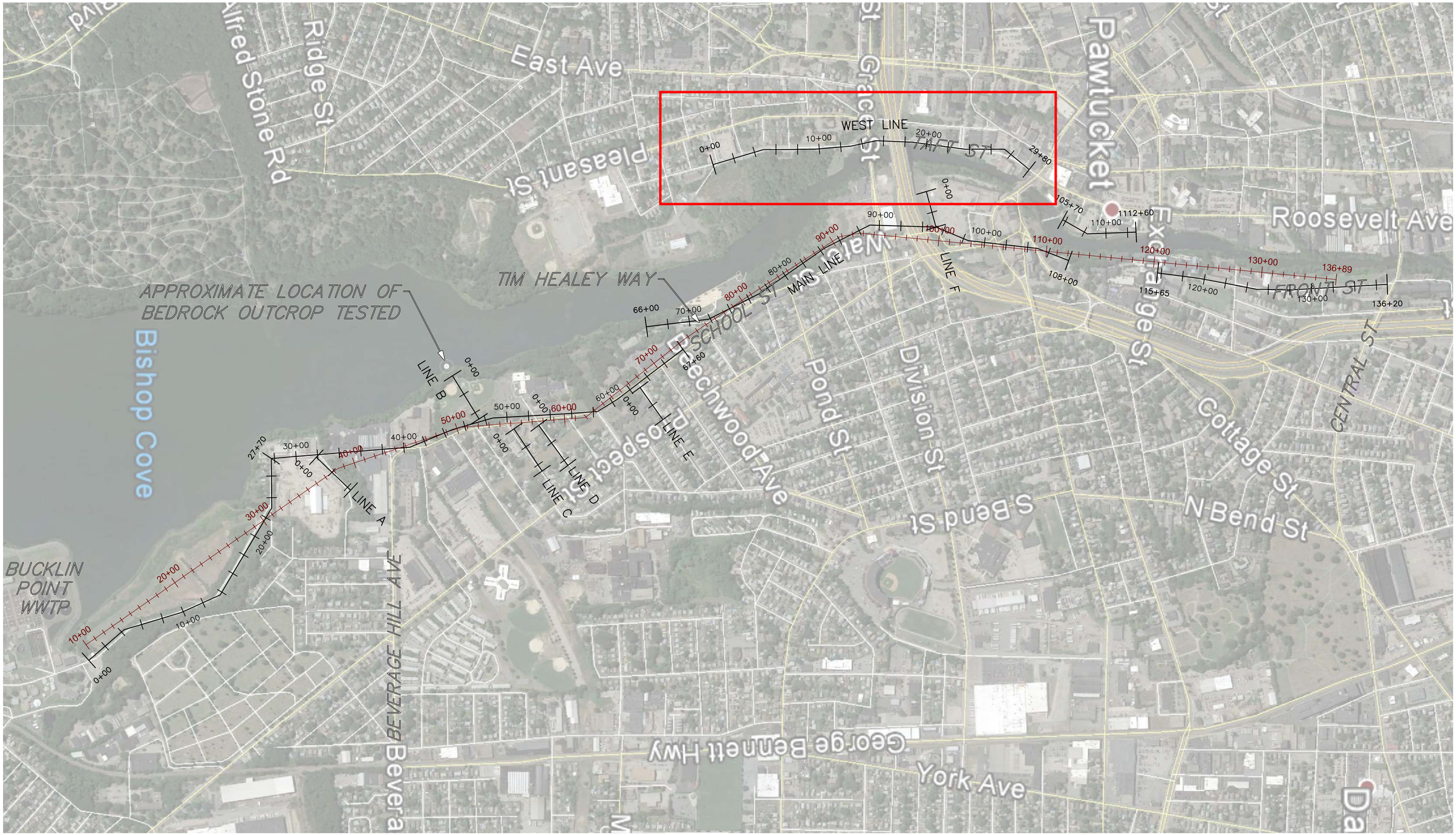
Prepared for:

Stantec
260 West Exchange Street, Suite 001
Providence, Rhode Island 02903

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079

File 17J33
November, 2017



LEGEND

0+00 — 27+70 SEISMIC LINE

130+00 — 136+89 MAIN LINE TUNNEL – ALTERNATIVE 5A ALIGNMENT PER STANTEC

SCALE (feet) 0 400 800

H-R N

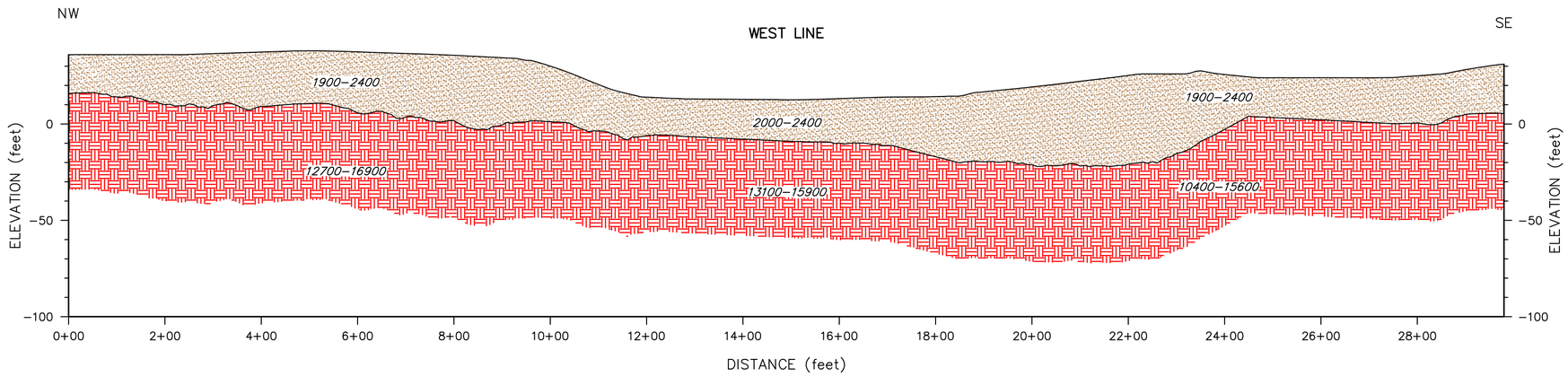
NOTE:

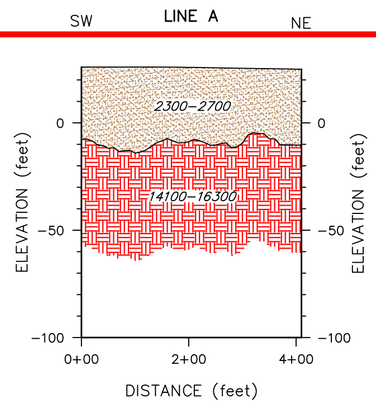
Modified from Google Earth Pro aerial photograph.

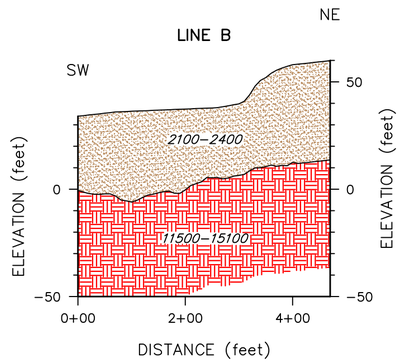
PLATE 1
SEISMIC LINE LOCATIONS
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW PROJECT
PAWTUCKET MAIN TUNNEL SECTION
PAWTUCKET, RHODE ISLAND

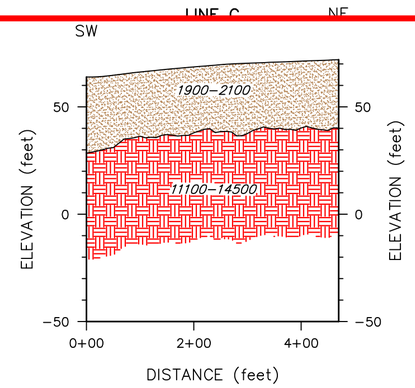
FILE 17J33 | NOVEMBER, 2017

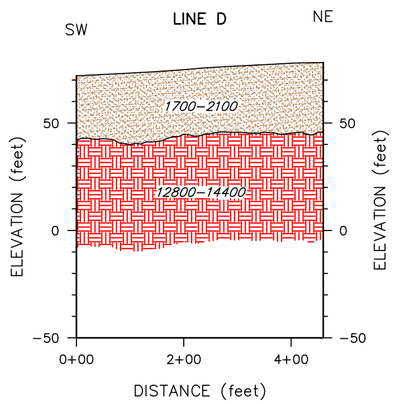
HAGER–RICHTER
SALEM, NH | FORDS, NJ

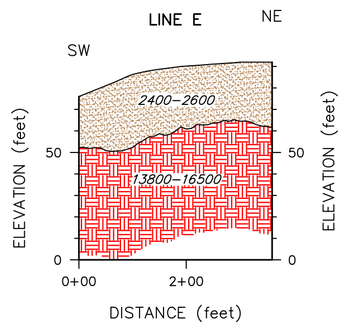


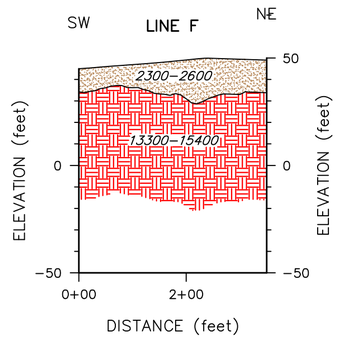












NOTES:

1. Estimated accuracy (standard deviation) of depth of bedrock is ±10% or 2 feet, whichever is greater.
2. The depths determined for bedrock are depths of competent rock; weathered and/or fractured bedrock might occur at shallower depths.
3. Surface elevations determined from plans provided by Stantec. Vertical datum is NGVD 1929.
4. Data were analyzed using the Generalized Reciprocal Method.

SCALE (feet)
0 100 200
Vertical Exaggeration = 4X

LEGEND

UNSATURATED / PARTIALLY SATURATED SOILS

COMPETENT BEDROCK

12200–14100 VELOCITY (fps)

INTERFACE DETERMINED FROM SEISMIC REFRACTION DATA

PLATE 3
SEISMIC PROFILES – WEST LINE & CROSS LINES
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW PROJECT
PAWTUCKET MAIN TUNNEL SECTION
PAWTUCKET, RHODE ISLAND

FILE 17J33 | NOVEMBER, 2017

HAGER–RICHTER
SALEM, NH | FORDS, NJ

Pawtucket Bridge No. 550

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0550(003) IM-0550(004) IMG-0550(005)	2010	1	196

INDEX - VOLUME 3 BRIDGE PLANS

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	INDEX OF DRAWINGS
3	STANDARD PLAN SYMBOLS
4-7	BRIDGE GENERAL NOTES SHEET 1 - 4
8	KEY PLAN
9-12	BRIDGE PHASE CONSTRUCTION PLAN SHEET 1 - 4
13-22	BRIDGE PHASE CONSTRUCTION SECTIONS SHEET 1-10
23-24	MSE WRAP FACE RETAINING WALLS SHEET 1-2
25-32	DEMOLITION PLAN SHEET 1 - 8
33	PRECAST CONC. BARRIER LIGHT STD. BARRIER
34	FOUNDATIONS FOR OVERHEAD SIGNS
35	TRANSITION BARRIER DETAILS
36-37	SITE AND SUBSURFACE EXPLORATION LOCATION PLAN SHEET 1 - 2
38-49	TEST BORINGS B1 - B31
50-51	INSTRUMENTATION LOCATION PLAN SHEET 1 - 2
52	INSTRUMENTATION DETAILS
53-54	SUMMARY SOIL CLASSIFICATION PLAN I - 2
55-79	PLEASANT STREET BRIDGE NO. 1551
80-131	PAWTUCKET BRIDGE NO. 550
132-148	WATER STREET BRIDGE NO. 552
149-164	SCHOOL STREET OFF-RAMP BRIDGE NO. 553
165-181	SCHOOL STREET BRIDGE NO. 554
182-196	RETAINING WALLS

R.I. STANDARD SPECIFICATIONS AND STANDARD DETAILS

SPECIFICATIONS TO GOVERN THIS PROJECT ARE THE R.I. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2004 EDITION, WITH ALL REVISIONS, AND THE STATE AND FEDERAL SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS. STANDARD DETAILS FOR THIS PROJECT ARE R.I. STANDARD DETAILS, 1998 EDITION, WITH ALL REVISIONS.

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

PLANS, PROFILES AND SECTIONS OF PROPOSED

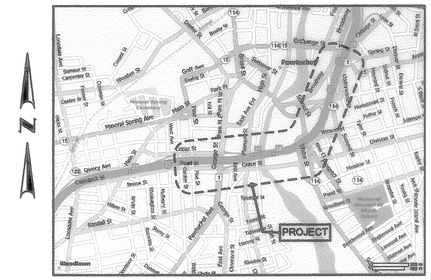
BRIDGE REPLACEMENT

PAWTUCKET BRIDGE NO. 550
I-95 OVER THE SEEKONK RIVER
VOLUME 3 BRIDGE PLANS

PROJECT LIMITS

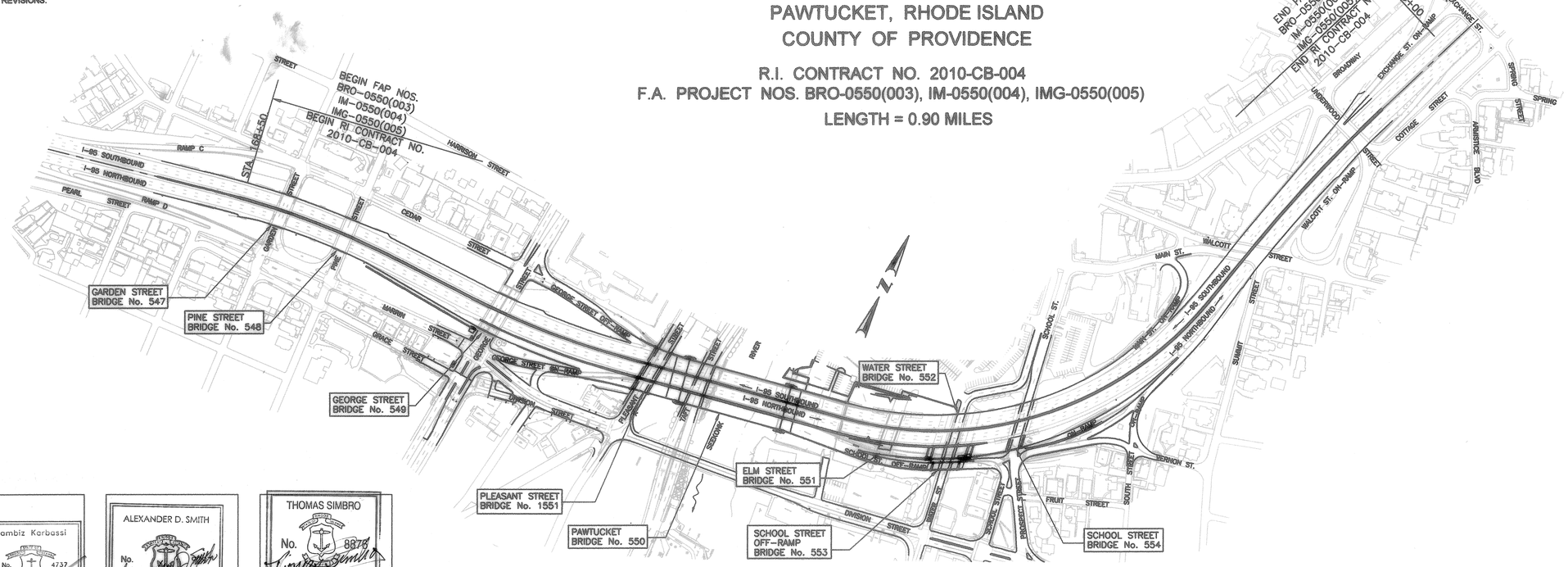
GARDEN STREET BRIDGE TO EXCHANGE STREET BRIDGE
PAWTUCKET, RHODE ISLAND
COUNTY OF PROVIDENCE

R.I. CONTRACT NO. 2010-CB-004
F.A. PROJECT NOS. BRO-0550(003), IM-0550(004), IMG-0550(005)
LENGTH = 0.90 MILES



LOCATION MAP

SEE VOLUME 1 FOR HIGHWAY PLANS
SEE VOLUME 2 FOR HIGHWAY CROSS-SECTIONS AND PROFILES
VOLUME 3 BRIDGE PLANS: BRIDGE PHASING, BRIDGE DEMOLITION, SUBSURFACE EXPLORATION
PLEASANT STREET BRIDGE NO. 1551
PAWTUCKET BRIDGE NO. 550
WATER STREET BRIDGE NO. 552
SCHOOL STREET OFF-RAMP BRIDGE NO. 553
SCHOOL STREET BRIDGE NO. 554
RETAINING WALLS
SEE VOLUME 4 FOR ELECTRICAL AND ARCHITECTURAL PLANS
SEE VOLUME 5 FOR BRIDGE PLANS: GARDEN STREET NO. 547
PINE STREET BRIDGE NO. 548
GEORGE STREET BRIDGE NO. 549
SEE VOLUME 6 FOR HIGHWAY PLANS



LAYOUT PLAN
SCALE: 1"=200'

DESIGN DESIGNATION I-95

2010 AADT = 184,600 V.P.D.
2030 AADT = 244,200 V.P.D.
2010 DHV = 14,400 V.P.H.
2030 DHV = 19,000 V.P.H.
D = 50/50
K = 7.8%
T = 13.1%
V = 50 MPH

Kambiz Karbassi
No. 4737
REGISTERED PROFESSIONAL ENGINEER
3/24/10

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
SHEETS 1-35, 55-182, 184-196

ALEXANDER D. SMITH
No.
REGISTERED PROFESSIONAL ENGINEER CIVIL
3/25/10

HALEY & ALDRICH, INC.
SHEETS 36-52, 183

THOMAS SIMBRO
No. 8878
REGISTERED PROFESSIONAL ENGINEER (CIVIL)
3-25-10

WRIGHT-PIERCE
SHEETS 53-54

CEC# 08005.00

BASE OF LEVELS
NGVD 1929 VERTICAL
RI PLANE COORDINATE SYSTEM
NAD 1983 HORIZONTAL

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

Contract Number	2010-CB-004
Volume Number	3
Number of Sheet	G-1
Total Sheets	196

R.I. DEPARTMENT OF TRANSPORTATION

APPROVED
DEPUTY CHIEF ENGINEER — DATE 3/26/10

APPROVED
CHIEF ENGINEER — DATE 3/29/10

APPROVED
DIRECTOR — DATE 3/29/10

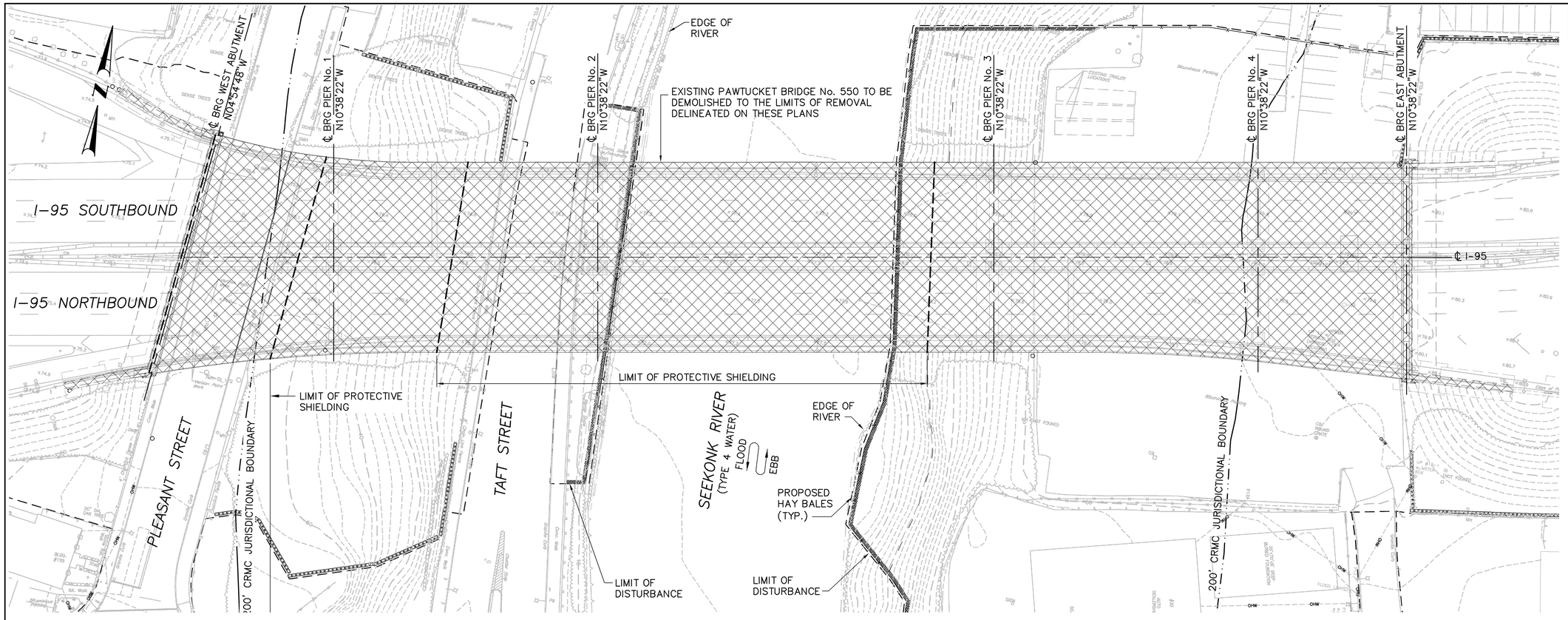
US DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
For DIVISION ADMINISTRATOR — DATE 4/7/10

0143G_V3_001_BCOVER001

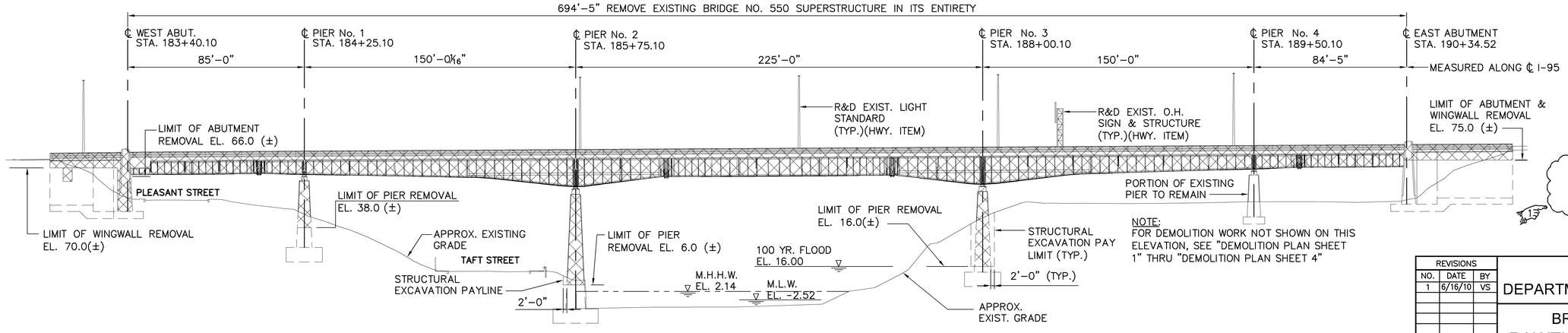
FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI		2010	25	196

R-1



EXISTING BRIDGE PLAN

SCALE: 1"=30'



NOTE:
FOR DEMOLITION WORK NOT SHOWN ON THIS ELEVATION, SEE "DEMOLITION PLAN SHEET 1" THRU "DEMOLITION PLAN SHEET 4"

EXISTING SOUTH ELEVATION - (LOOKING NORTH)

SCALE: 1"=30'

LEGEND

DENOTES AREAS TO BE REMOVED & DISPOSED (REFER TO SECTIONS FOR DETAILED LIMITS OF REMOVAL)

NOTES:

1. THE LIMITS OF REMOVAL SHOWN ON THESE PLAN SHEETS DEPICTS THE PORTIONS OF THE EXISTING BRIDGE TO BE DEMOLISHED UNDER THIS CONTRACT. THE DEMOLITION WILL BE PERFORMED IN PHASES AS IDENTIFIED BY THE BRIDGE PHASE CONSTRUCTION SHEETS.
2. PLANS AND DETAILS SHOWN ON THE DEMOLITION PLANS ARE ILLUSTRATIVE TO DEPICT THE LIMITS OF REMOVAL. THE CONTRACTOR IS REFERRED TO THE ORIGINAL CONSTRUCTION PLANS FOR THE COMPOSITION AND DETAILS OF THE SUPERSTRUCTURE AND SUBSTRUCTURE ELEMENTS.
3. UNLESS NOTED OTHERWISE, ALL AREAS DISTURBED DURING DEMOLITION AND REMOVAL WORK SHALL BE BACKFILLED WITH COMMON BORROW AND RESTORED TO THEIR ORIGINAL CONDITION.
4. ALL ELEVATIONS ARE IN FEET AND REFERENCE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
5. PORTIONS OF THE SUBSTRUCTURES TO REMAIN SHALL BE FINISH GRADED TO WITHIN A TOLERANCE OF ±6 INCHES OF REMOVAL DEPTH. ALL EXISTING CONCRETE IS ASSUMED TO CONTAIN STEEL REINFORCEMENT. UNLESS NOTED OTHERWISE, ALL PROTRUDING REINFORCEMENT SHALL BE CUT FLUSH TO THE LIMIT OF REMOVAL.
6. THE DEMOLITION LIMITS SHOWN ON THESE DRAWINGS INDICATE MINIMUM LIMITS OF REMOVAL. WHERE PORTIONS OF EXISTING SUBSTRUCTURES ARE INDICATED TO REMAIN (AND NOT RE-USED), OR WHERE EXISTING SUBSTRUCTURES ARE TO BE ABANDONED IN PLACE, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, REMOVE AND DISPOSE THESE ELEMENTS TO FACILITATE THE DEMOLITION OR CONSTRUCTION OPERATIONS.
7. DISPOSITION OF DEMOLITION MATERIAL TO BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ALL OTHER APPLICABLE REGULATIONS.
8. THE FILL MATERIAL USED TO BACKFILL VOIDS RESULTING FROM BELOW GRADE DEMOLITION SHALL BE COMMON BORROW.

ADDENDUM No. 4

REVISIONS		
NO.	DATE	BY
1	6/16/10	VS

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT
PAWTUCKET BRIDGE NO. 550

PAWTUCKET, RHODE ISLAND

DEMOLITION PLAN SHEET 1
PLAN AND ELEVATION
BRIDGE No. 550

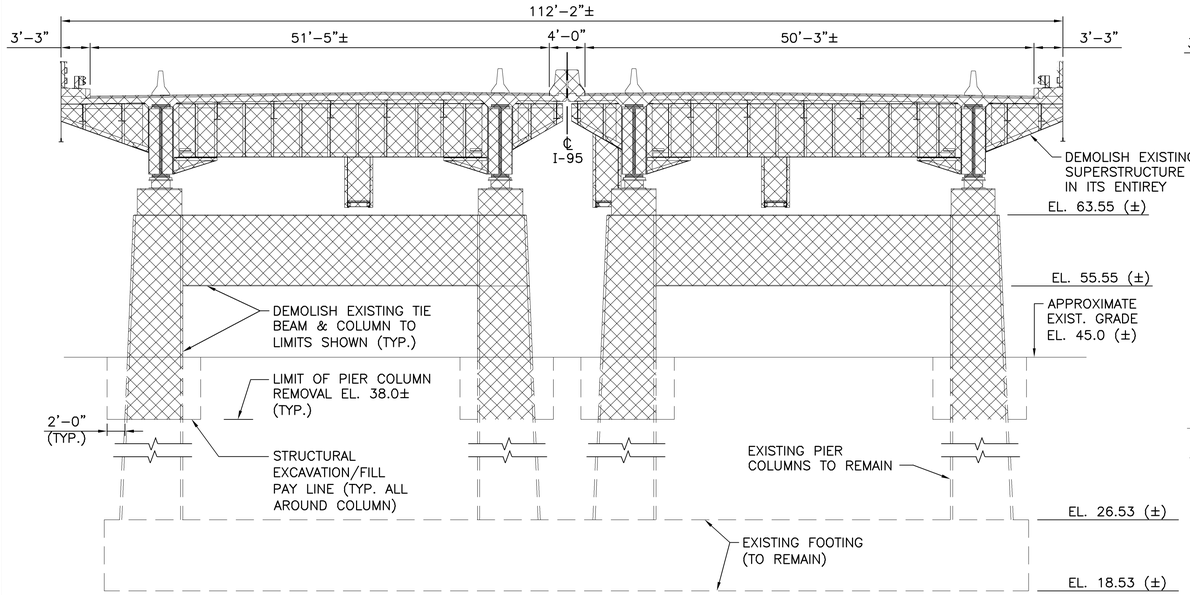
COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

SCALE AS SHOWN | SHEET DESIGNATION G-25

0143G_V3_025_DEM0001ADD04

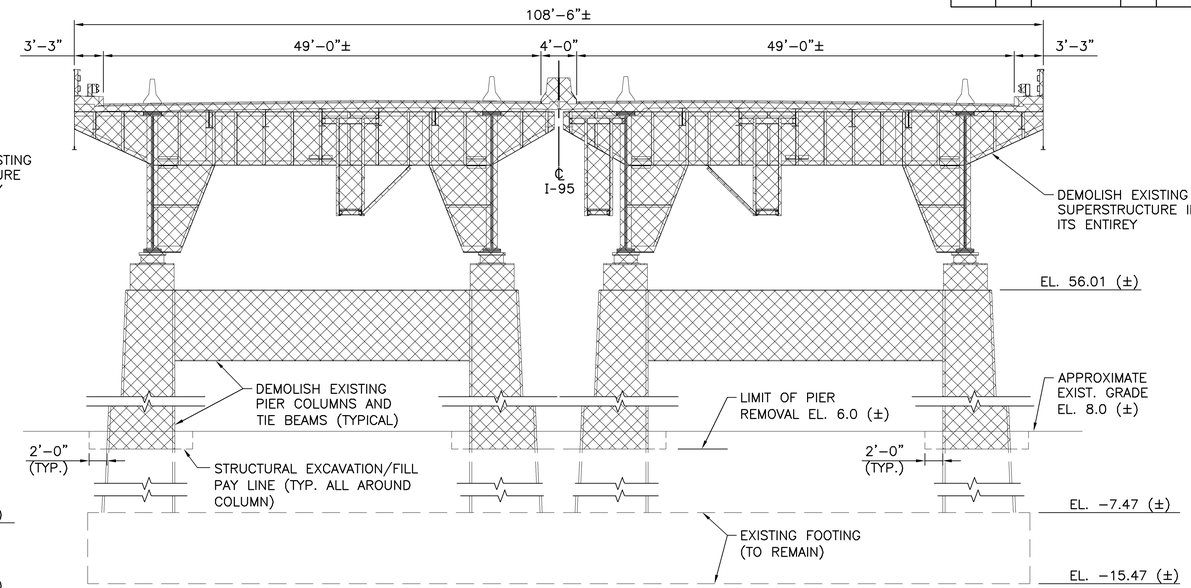
© \\BRIDGE\Projects\Current_Drawings\Structural_Current_Drawings\BRIDGE PLAN DRAWINGS\0143G_V3_025_DEM0001ADD04.dwg 7/20/2010 9:26:15 AM RRF

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI		2010	26	196



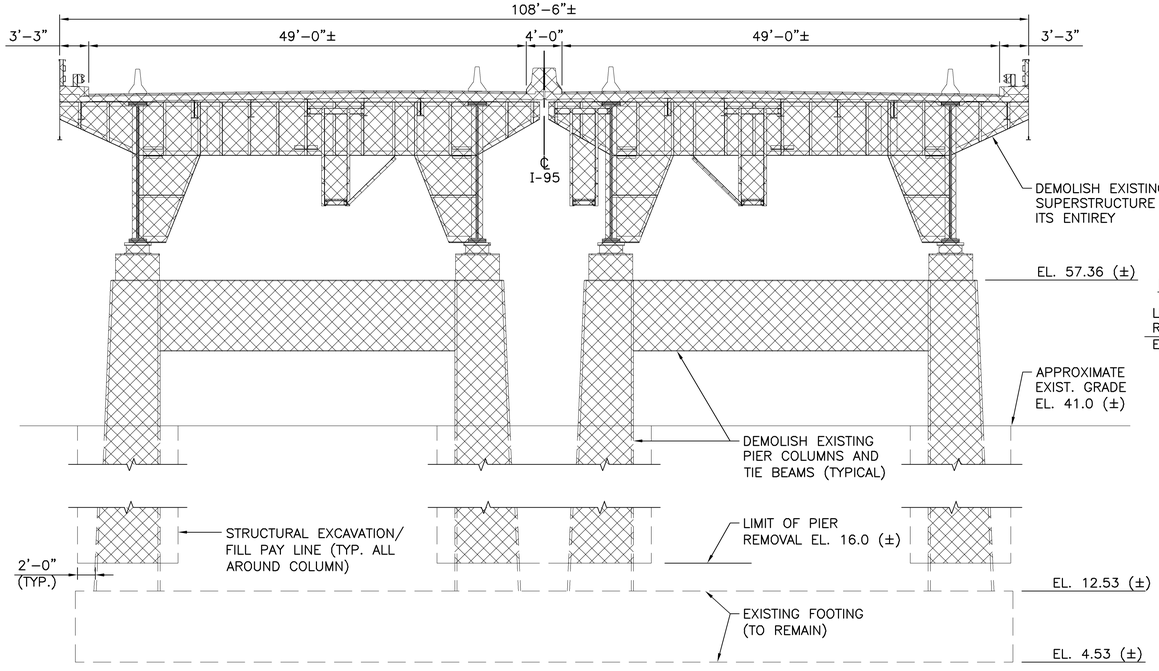
WEST ELEVATION - PIER No. 1

SCALE: 1/8"=1'-0"



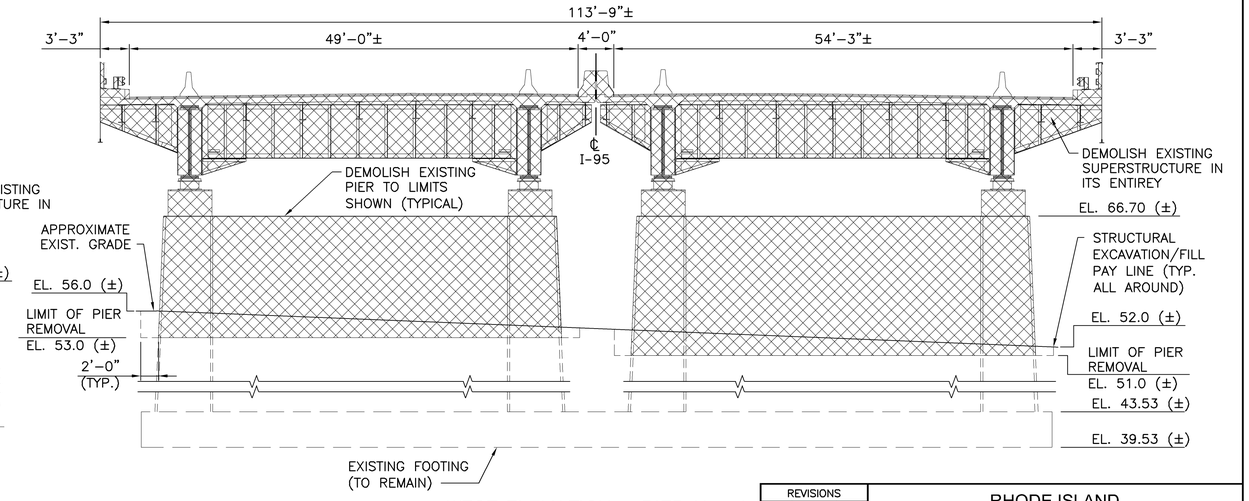
WEST ELEVATION - PIER No. 2

SCALE: 1/8"=1'-0"



WEST ELEVATION - PIER No. 3

SCALE: 1/8"=1'-0"



WEST ELEVATION - PIER No. 4

SCALE: 1/8"=1'-0"

NOTE:

1. FOR APPLICABLE NOTES, REFER TO "DEMOLITION PLAN SHEET 1".

LEGEND

DENOTES AREAS TO BE REMOVED & DISPOSED

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT
PAWTUCKET BRIDGE NO. 550

PAWTUCKET, RHODE ISLAND

DEMOLITION PLAN SHEET 2

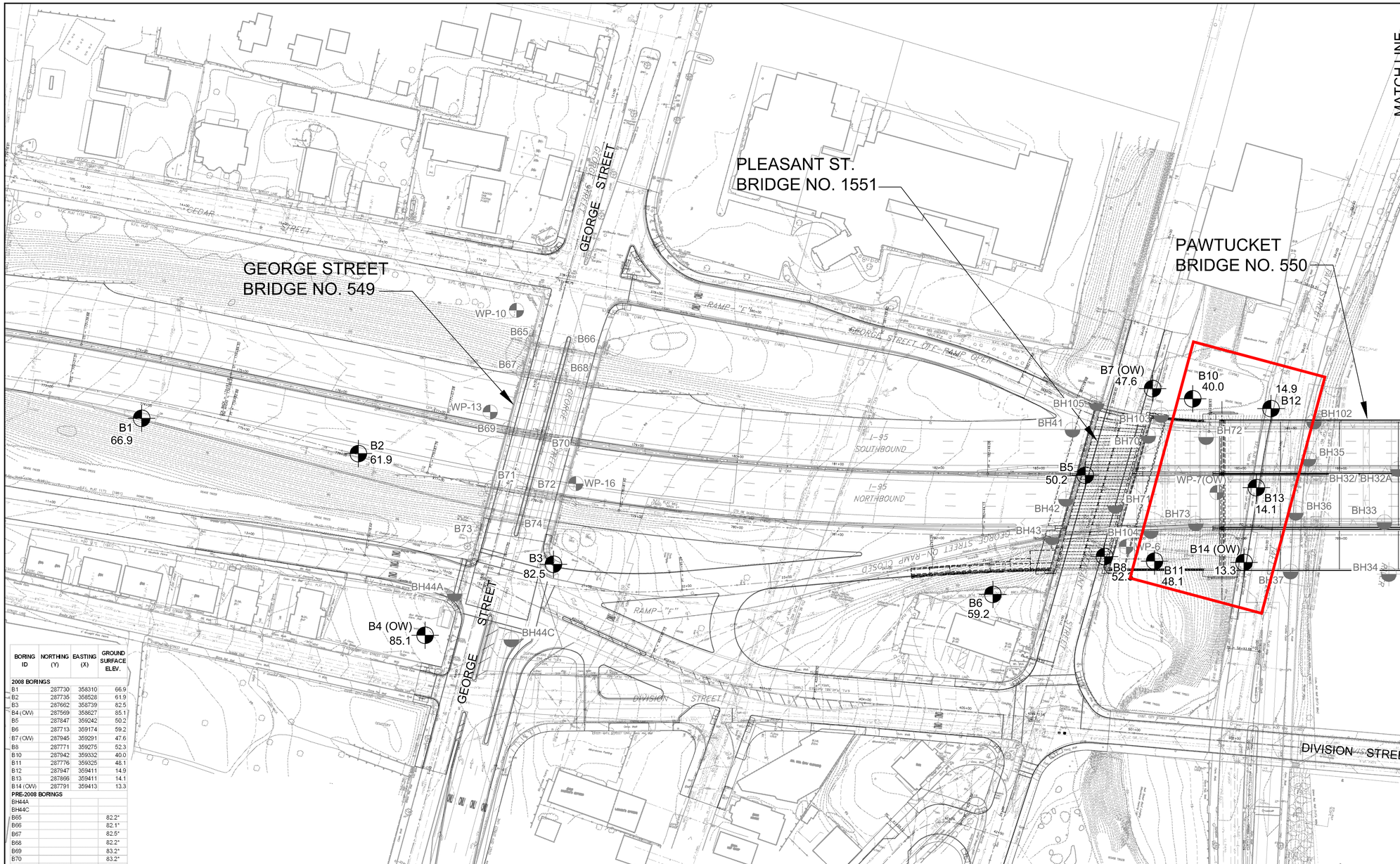
PIER REMOVAL
BRIDGE No. 550

SCALE AS SHOWN | SHEET DESIGNATION G-26

0143G_V3_026_DEM0002

O:\0900\0900\00\BridX Final Design_Drawings\Structural_Current_Drawings\BRIDGE PLAN DRAWINGS\0143G_V3_026_DEM0002.dwg, 4/16/2010 12:51:07 PM, JTA

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI		2010	36	196



BORING ID	NORTHING (Y)	EASTING (X)	GROUND SURFACE ELEV.
2008 BORINGS			
B1	287730	358310	66.9
B2	287735	358528	61.9
B3	287662	358739	82.5
B4 (OW)	287569	358627	85.1
B5	287847	359242	50.2
B6	287713	359174	59.2
B7 (OW)	287945	359291	47.6
B8	287771	359275	52.3
B10	287942	359332	40.0
B11	287776	359325	48.1
B12	287947	359411	14.9
B13	287866	359411	14.1
B14 (OW)	287791	359413	13.3
PRE-2008 BORINGS			
BH44A			
BH44C			
B65			82.2*
B66			82.1*
B67			82.5*
B68			82.2*
B69			83.2*
B70			83.2*
B71			84.1*
B72			83.5*
B73			83.6*
B74			83.6*
BH32			2.5*
BH32A			2.5*
BH33			2.5*
BH34			2.5*
BH35			7.5*
BH36			7.5*
BH37			8.0*
BH41			50.5*
BH42			51.5*
BH43			52.2*
BH70			44.5*
BH71			50.0*
BH72			30.0*
BH73			33.0*
BH102			7.5*
BH103			42.5*
BH104			42.0*
BH105			49.5*
* Estimated			

LEGEND:

- B1 66.9 — DESIGNATION, LOCATION AND GROUND SURFACE ELEVATION OF TEST BORING DRILLED BY NEW HAMPSHIRE BORING, INC. OF LONDONDERRY, NEW HAMPSHIRE IN MARCH AND APRIL 2008 IN CONNECTION WITH THE REPLACEMENT OF BRIDGE 550.
- B-1 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING MONITORED BY GEO TEK ENGINEERING INC. OF PROVIDENCE, RHODE ISLAND IN JULY 2001 IN CONNECTION WITH THE VERNON STREET ON-RAMP SAFETY IMPROVEMENTS. (SEE NOTE 6.)
- B65 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY ALLSTATE DRILLING CO. OF EAST PROVIDENCE, RHODE ISLAND IN JANUARY AND FEBRUARY 1961 IN CONNECTION WITH THE CONSTRUCTION OF THE EXISTING GEORGE STREET BRIDGE (SEE NOTE 6).
- BH15 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY AMERICAN DRILLING COMPANY OF EAST PROVIDENCE, RHODE ISLAND IN CONNECTION WITH THE CONSTRUCTION OF THE EXISTING BRIDGE 550, SCHOOL STREET BRIDGE, WATER STREET BRIDGE, AND ELM STREET BRIDGE (SEE NOTE 6).
- WP-6 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING MONITORED BY WRIGHT-PIERCE OF PROVIDENCE, RHODE ISLAND IN DECEMBER 2008, FEBRUARY 2009 AND JULY 2009.
- 60 — ELEVATION CONTOUR OF EXISTING GROUND SURFACE
- (OW) — DENOTES OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

N
W E
S

0 50 100 150 200
SCALE IN FEET

NOTES:

1. EXISTING SITE CONDITIONS, CONTOURS OF EXISTING GROUND SURFACE ELEVATIONS AND LOCATION AND ORIENTATION OF EXISTING SITE FEATURES ARE TAKEN FROM THE ELECTRONIC AUTOCAD FILE STRUCTCUT_PHASE-1D.dwg" RECEIVED BY HALEY & ALDRICH FROM COMMONWEALTH ENGINEERS & CONSULTANTS, INC. ON 14 FEBRUARY 2008.
2. PROPOSED SITE CONDITIONS AND THE LOCATION AND ORIENTATION OF PROPOSED SITE FEATURES ARE TAKEN FROM THE ELECTRONIC AUTOCAD FILE "SCHOOL STREET OPEN.dwg" RECEIVED BY HALEY & ALDRICH FROM COMMONWEALTH ENGINEERS & CONSULTANTS ON 25 JANUARY 2008.
3. LOCATIONS OF HISTORIC TEST BORINGS ARE APPROXIMATE AND WERE ESTIMATED FROM HISTORIC PLANS. LOCATIONS OF WRIGHT-PIERCE BORINGS ARE APPROXIMATE AND WERE PROVIDED IN ELECTRONIC FORMAT FROM COMMONWEALTH ENGINEERS & CONSULTANTS, INC. ON 3 DECEMBER 2009. LOCATIONS OF RECENT TEST BORINGS WERE DETERMINED IN THE FIELD BY CROSSMAN ENGINEERING, INC. USING ELECTRONIC DISTANCE MEASUREMENT AND TRIANGULATION METHODS RELATIVE TO FIXED REFERENCE POINTS.
4. COORDINATE GRID SYSTEM USED IS THE RHODE ISLAND STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. ELEVATIONS ARE IN FEET AND REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).
6. RECENT SUBSURFACE EXPLORATIONS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH PERSONNEL.
7. REFER TO PROJECT GEOTECHNICAL DATA REPORT (DATED FEBRUARY 2008), APPENDIX B FOR LOGS OF RECENT TEST BORINGS (HALEY & ALDRICH), APPENDIX C FOR LOGS OF HISTORIC TEST BORINGS (OTHERS), APPENDIX D FOR OBSERVATION WELL INSTALLATION AND GROUNDWATER MONITORING REPORTS, AND APPENDIX F FOR LOGS OF TEST BORINGS BY WRIGHT-PIERCE.

HALEY & ALDRICH
HALEY & ALDRICH, INC.
465 Medford Street, Suite 2200
Boston, MA 02129-1400
Phone: 617.886.7400
Fax: 617.886.7600
HaleyAldrich.com

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT
PAWTUCKET BRIDGE NO. 550

PAWTUCKET, RHODE ISLAND

SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SHEET 1 OF 2

SCALE AS SHOWN | SHEET DESIGNATION G-36

0143G_V3_036_BORELOC001

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI		2010	41	196

Boring B10 – Sheet 1 of 2

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B10 — Sheet 1 of 2
Location (C/T): PAWTUCKET — RIDOT Database ID #:
RIC #: 2001-EB-003 — FAP #: BRO-BCDR(009) — Date Start: 2/29/08 — Date End: 2/29/08
Bridge/Road #: Bridge No. 550/ I-95 — N Coord.: 287,942 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants — E Coord.: 359,332 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc. — Ground Surface Elev., Ft.: 40.0
Inspector Name/Co.: Scott Shay / Haley & Aldrich, Inc. — Elevation Datum: NGVD29

Methods Used to Determine Borehole Coordinates and Elevation:
2 / Survey

Drilling Firm: New Hampshire Boring, Inc. — Project No.:
Drilling Foreman: Todd Penticost

Drilling Rig Make & Model: Diedrich D-50
Drilling Methods and Tools
Casing Size: 4 in — Hollow Stem Auger ☐ — Flight OD: ____ (in)
Methods Used to Advance Casing:
Driven (300 lbs) ☒ — Push ☐ — Roller Bit ☐ — Spin ☐ — Open Hole ☐
Drill Rod Size: ____ Wt./Ft. ____ (lbs)

Soils/Rock Sampling:
SPT Hammer Type — Donut ☐ — Safety ☒ — Automatic Trip ☐ — Other ____
Hammer Wt: 140 (lbs) — Hammer Fall: 30 (in)
Split Spoon Sampler: Barrel Length: 24 — Barrel ID: 1.375 (in) — Barrel OD: 2 (in)
Shoe ID: 1.375 (in) — Shoe OD: 2 (in)
Liner Type: Brass ☐ — Stainless Steel ☐ — Plastic ☐ — Spring Core Catcher ☐
Undisturbed Samplers:
Shelby Tube: Length: ____ (in) ID/OD: ____ (in)
Fixed Piston Sampler Type — Length: ____ (in) ID/OD: ____ (in)
Other: ____ Length: ____ (in) ID/OD: ____ (in)

Bedrock Core Barrel Type: ____ ID/OD: ____ (in) Core Diameter: ____ (in)

Groundwater Monitoring: Well Screen Depth from: ____ (ft) to ____ (ft)

Soil/Rock Samples Delivered to:
Name: Haley & Aldrich, Inc. — Date:
Address: One Davol Square, Providence, RI 02903

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

RIC #: 2001-EB-003
Boring No.: B10
Database ID No.:

Boring B11 – Sheet 1 of 2

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B11 — Sheet 1 of 2
Location (C/T): PAWTUCKET — RIDOT Database ID #:
RIC #: 2001-EB-003 — FAP #: BRO-BCDR(009) — Date Start: 2/28/08 — Date End: 2/28/08
Bridge/Road #: Bridge No. 550/ I-95 — N Coord.: 287,776 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants — E Coord.: 359,325 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc. — Ground Surface Elev., Ft.: 48.1
Inspector Name/Co.: Scott Shay / Haley & Aldrich, Inc. — Elevation Datum: NGVD29

Methods Used to Determine Borehole Coordinates and Elevation:
2 / Survey

Drilling Firm: New Hampshire Boring, Inc. — Project No.:
Drilling Foreman: Todd Penticost

Drilling Rig Make & Model: Diedrich D-50
Drilling Methods and Tools
Casing Size: 4 in — Hollow Stem Auger ☐ — Flight OD: ____ (in)
Methods Used to Advance Casing:
Driven (300 lbs) ☒ — Push ☐ — Roller Bit ☐ — Spin ☐ — Open Hole ☐
Drill Rod Size: ____ Wt./Ft. ____ (lbs)

Soils/Rock Sampling:
SPT Hammer Type — Donut ☐ — Safety ☒ — Automatic Trip ☐ — Other ____
Hammer Wt: 140 (lbs) — Hammer Fall: 30 (in)
Split Spoon Sampler: Barrel Length: 24 — Barrel ID: 1.375 (in) — Barrel OD: 2 (in)
Shoe ID: 1.375 (in) — Shoe OD: 2 (in)
Liner Type: Brass ☐ — Stainless Steel ☐ — Plastic ☐ — Spring Core Catcher ☐
Undisturbed Samplers:
Shelby Tube: Length: ____ (in) ID/OD: ____ (in)
Fixed Piston Sampler Type — Length: ____ (in) ID/OD: ____ (in)
Other: ____ Length: ____ (in) ID/OD: ____ (in)

Bedrock Core Barrel Type: ____ ID/OD: ____ (in) Core Diameter: ____ (in)

Groundwater Monitoring: Well Screen Depth from: ____ (ft) to ____ (ft)

Soil/Rock Samples Delivered to:
Name: Haley & Aldrich, Inc. — Date:
Address: One Davol Square, Providence, RI 02903

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

RIC #: 2001-EB-003
Boring No.: B11
Database ID No.:

Boring B12 – Sheet 1 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B12 — Sheet 1 of 3
Location (C/T): PAWTUCKET — RIDOT Database ID #:
RIC #: 2001-EB-003 — FAP #: BRO-BCDR(009) — Date Start: 2/20/08 — Date End: 2/20/08
Bridge/Road #: Bridge No. 550/ I-95 — N Coord.: 287,947 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants — E Coord.: 359,411 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc. — Ground Surface Elev., Ft.: 14.9
Inspector Name/Co.: D. Palleiko/S. Shay / Haley & Aldrich, Inc. — Elevation Datum: NGVD29

Methods Used to Determine Borehole Coordinates and Elevation:
2 / Survey

Drilling Firm: New Hampshire Boring, Inc. — Project No.:
Drilling Foreman: Don Dunklee

Drilling Rig Make & Model: Acker AD II
Drilling Methods and Tools
Casing Size: 4 in — Hollow Stem Auger ☐ — Flight OD: ____ (in)
Methods Used to Advance Casing:
Driven (300 lbs) ☒ — Push ☐ — Roller Bit ☐ — Spin ☐ — Open Hole ☐
Drill Rod Size: ____ Wt./Ft. ____ (lbs)

Soils/Rock Sampling:
SPT Hammer Type — Donut ☐ — Safety ☒ — Automatic Trip ☐ — Other ____
Hammer Wt: 140 (lbs) — Hammer Fall: 30 (in)
Split Spoon Sampler: Barrel Length: 24 — Barrel ID: 1.375 (in) — Barrel OD: 2 (in)
Shoe ID: 1.375 (in) — Shoe OD: 2 (in)
Liner Type: Brass ☐ — Stainless Steel ☐ — Plastic ☐ — Spring Core Catcher ☐
Undisturbed Samplers:
Shelby Tube: Length: ____ (in) ID/OD: ____ (in)
Fixed Piston Sampler Type — Length: ____ (in) ID/OD: ____ (in)
Other: ____ Length: ____ (in) ID/OD: ____ (in)

Bedrock Core Barrel Type: Standard double tube — ID/OD: 2/2.8 (in) — Core Diameter: 2 (in)

Groundwater Monitoring: Well Screen Depth from: ____ (ft) to ____ (ft)

Soil/Rock Samples Delivered to:
Name: Haley & Aldrich, Inc. — Date:
Address: One Davol Square, Providence, RI 02903

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

RIC #: 2001-EB-003
Boring No.: B12
Database ID No.:

Boring B12 – Sheet 3 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B12 — Sheet 3 of 3
Location (C/T): PAWTUCKET — RIDOT Database ID #:

Depth Ft.	Casing Blows/Ft.	Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
				31.0	(8)		31.0	SANDSTONE AND SILTSTONE (continued) BOTTOM OF EXPLORATION AT 31.0 FT	

REMARKS:

Proportions Used	Sampler Type	Cohesionless (140# Wt x 30" fall on 2" OD SS Sampler)	Density	Cohesive	Consistency
trace 0 to 10%	SS - Split Spoon	0 - 10	Loose	0 - 4	Soft
little 10 to 20%	UT - Shelby Tube	10 - 30	Medium Dense	4 - 8	Firm
some 20 to 35%	UP - Fixed Position	30 - 50	Dense	8 - 15	Stiff
and 35 to 50%	C - Rock Core	50 +	Very Dense	15 - 30	Very Stiff
				30 +	Hard

RIC #: 2001-EB-003
Boring No.: B12
Date Completed: 2/20/08
Database ID No.:

Boring B10 – Sheet 2 of 2

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B10 — Sheet 2 of 2
Location (C/T): PAWTUCKET — RIDOT Database ID #:
RIC #: 2001-EB-003 — FAP #: BRO-BCDR(009) — Date Start: 2/29/08 — Date End: 2/29/08
Bridge/Road #: Bridge No. 550/ I-95 — N Coord.: 287,942 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants — E Coord.: 359,332 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc. — Ground Surface Elev., Ft.: 40.0
Inspector Name/Co.: Scott Shay / Haley & Aldrich, Inc. — Elevation Datum: NGVD29

Borehole Location Description: Between Pleasand Street and Taft Street
Sampler: Unless otherwise noted, soil sampler consists of a 2 in. split spoon driven using a 140 lb hammer, 30 in fall.
Casing: Unless otherwise noted, casing is driven using 300 lb hammer, falling 24 in.
Casing Size: 4 in — HS Auger ____

Groundwater Observations: Date	Time	Depth	Casing at	Stab. Time

Depth Ft.	Casing Blows/Ft.	Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
		SS-1	24/6	0.0 – 2.0	2-2-2-4	Loose dark brown gravelly SILT, trace roots		TOPSOIL/FILL	1
							2.5	FILL	
5		SS-2	24/10	4.0 – 6.0	18-19-17-16	Dense brown silty SAND, little gravel. Appears to be disturbed.			
							8.0	ALLUVIAL DEPOSITS	
10		SS-3	24/18	9.0 – 11.0	37-28-22-18	Dense brown interbedded fine sandy SILT with coarse to medium SAND, trace fine gravel in layers up to 4.0 in. thick, trace organics			
							13.0	GLACIAL TILL	
15		SS-4	5/5	14.0 – 14.4	100/5"	Very dense brown silty SAND, little gravel, moderately well bonded with abrupt change in bottom 3.0 in. of sample to gray angular rock fragments	14.4	POSSIBLE TOP OF BEDROCK AT 14.2 FT; BOTTOM OF EXPLORATION AT 14.4 FT	2, 3
20									
25									
30									

REMARKS: 1. Groundwater not recorded. 2. Possible Top of Bedrock at 14.2 ft. 3. Split spoon refusal at 14.4 ft.

Proportions Used	Sampler Type	Cohesionless (140# Wt x 30" fall on 2" OD SS Sampler)	Density	Cohesive	Consistency
trace 0 to 10%	SS - Split Spoon	0 - 10	Loose	0 - 4	Soft
little 10 to 20%	UT - Shelby Tube	10 - 30	Medium Dense	4 - 8	Firm
some 20 to 35%	UP - Fixed Position	30 - 50	Dense	8 - 15	Stiff
and 35 to 50%	C - Rock Core	50 +	Very Dense	15 - 30	Very Stiff
				30 +	Hard

RIC #: 2001-EB-003
Boring No.: B10
Date Completed: 2/29/08
Database ID No.:

Boring B11 – Sheet 2 of 2

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B11 — Sheet 2 of 2
Location (C/T): PAWTUCKET — RIDOT Database ID #:
RIC #: 2001-EB-003 — FAP #: BRO-BCDR(009) — Date Start: 2/28/08 — Date End: 2/28/08
Bridge/Road #: Bridge No. 550/ I-95 — N Coord.: 287,776 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants — E Coord.: 359,325 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc. — Ground Surface Elev., Ft.: 48.1
Inspector Name/Co.: Scott Shay / Haley & Aldrich, Inc. — Elevation Datum: NGVD29

Borehole Location Description: Between Pleasand Street and Taft Street
Sampler: Unless otherwise noted, soil sampler consists of a 2 in. split spoon driven using a 140 lb hammer, 30 in fall.
Casing: Unless otherwise noted, casing is driven using 300 lb hammer, falling 24 in.
Casing Size: 4 in — HS Auger ____

Groundwater Observations: Date	Time	Depth	Casing at	Stab. Time
02/28/08	11:15	16.1	19	0.2 hr

Depth Ft.	Casing Blows/Ft.	Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
		SS-1	24/10	0.0 – 2.0	5-10-19-31	Medium dense dark brown silty SAND, trace coarse gravel, trace roots		FILL	
5		SS-2	24/11	4.0 – 6.0	12-14-15-19	Medium dense gray brown silty SAND, little gravel, trace roots			
10		SS-3	24/9	9.0 – 11.0	10-8-16-16	Medium dense sandy GRAVEL, some silt			
15		SS-4	24/4	14.0 – 16.0	14-6-5-12	Similar to above			
							17.5	GLACIAL TILL	
20		SS-5	12/12	19.0 – 20.0	16-22-42-100/0"	SS-5: Very dense brown silty SAND, trace gravel, moderately well bonded in-situ (6.0 in). SS-5A: Very dense gray brown to gray fractured weathered rock fragments (6.0 in.).	20.2	PROBABLE TOP OF BEDROCK AT 20.2 FT	
							20.7	BOTTOM OF EXPLORATION AT 20.7 FT	1
25									
30									

REMARKS: 1. Split spoon refusal at 20.7 ft.

Proportions Used	Sampler Type	Cohesionless (140# Wt x 30" fall on 2" OD SS Sampler)	Density	Cohesive	Consistency
trace 0 to 10%	SS - Split Spoon	0 - 10	Loose	0 - 4	Soft
little 10 to 20%	UT - Shelby Tube	10 - 30	Medium Dense	4 - 8	Firm
some 20 to 35%	UP - Fixed Position	30 - 50	Dense	8 - 15	Stiff
and 35 to 50%	C - Rock Core	50 +	Very Dense	15 - 30	Very Stiff
				30 +	Hard

RIC #: 2001-EB-003
Boring No.: B11
Date Completed: 2/28/08
Database ID No.:

Boring B12 – Sheet 2 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement — BORING #: B12 — Sheet 2 of 3
Location (C/T): PAWTUCKET — RIDOT Database ID #:
RIC #: 2001-EB-003 — FAP #: BRO-BCDR(009) — Date Start: 2/20/08 — Date End: 2/20/08
Bridge/Road #: Bridge No. 550/ I-95 — N Coord.: 287,947 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants — E Coord.: 359,411 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc. — Ground Surface Elev., Ft.: 14.9
Inspector Name/Co.: D. Palleiko/S. Shay / Haley & Aldrich, Inc. — Elevation Datum: NGVD29

Borehole Location Description: Taft Street
Sampler: Unless otherwise noted, soil sampler consists of a 2 in. split spoon driven using a 140 lb hammer, 30 in fall.
Casing: Unless otherwise noted, casing is driven using 300 lb hammer, falling 24 in.
Casing Size: 4 in — HS Auger ____

Groundwater Observations: Date	Time	Depth	Casing at	Stab. Time

Depth Ft.	Casing Blows/Ft.	Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
	7						0.3	CONCRETE	1
	11	SS-1	24/14	0.5 – 2.5	5-4-4-7	Loose olive brown silty medium to fine SAND. little fine gravel		FILL	
	29								
	10								
5	9	SS-2	24/8	4.0 – 6.0	10-9-16-12	Medium dense olive brown silty medium to fine SAND, little gravel, trace brick fragments			
	14								
	8								
	12								
	18								
10	50	SS-3	24/11	9.0 – 11.0	6-17-25-32	Dense red brown silty SAND, little coarse to fine gravel, wet	10.0	GLACIOFLUVIAL DEPOSITS	
	51								
	71						12.0	GLACIAL TILL	
	96								
15		SS-4	8/5	14.0 – 14.7	28-100/2"	Very dense red brown silty medium to fine SAND, little fine gravel, moderately bonded in-situ	14.6	PROBABLE TOP OF BEDROCK AT 14.6 FT; SANDSTONE AND SILTSTONE	
		C-5	36/35 75%	16.0 – 19.0	(8) (8) (8)	C-5: Hard, fresh to slightly weathered, fine-grained interbedded SANDSTONE and SILTSTONE. Bedding medium thick. Joints low angle, moderately spaced, rough, planar, fresh, open.			
20		C-6	48/48 90%	19.0 – 23.0	(8) (8) (8) (8)	C-6: Similar to above.			
25		C-7	36/34 53%	23.0 – 26.0	(8) (8) (8)	C-7: Similar to above.			
30		C-8	60/55 88%	26.0 –	(8) (8) (8) (8)	C-8: Similar to above.			

REMARKS: 1. Groundwater not recorded.

Proportions Used	Sampler Type	Cohesionless (140# Wt x 30" fall on 2" OD SS Sampler)	Density	Cohesive	Consistency
trace 0 to 10%	SS - Split Spoon	0 - 10	Loose	0 - 4	Soft
little 10 to 20%	UT - Shelby Tube	10 - 30	Medium Dense	4 - 8	Firm
some 20 to 35%	UP - Fixed Position	30 - 50	Dense	8 - 15	Stiff
and 35 to 50%	C - Rock Core	50 +	Very Dense	15 - 30	Very Stiff
				30 +	Hard

RIC #: 2001-EB-003
Boring No.: B12
Date Completed: 2/20/08
Database ID No.:

HALEY & ALDRICH
HALEY & ALDRICH, INC.
465 Medford Street, Suite 2200
Boston, MA 02129-1400
Phone: 617.886.7400
Fax: 617.886.7600
HaleyAldrich.com

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT
PAWTUCKET BRIDGE NO. 550

PAWTUCKET, RHODE ISLAND

TEST BORINGS B10, B11, B12

SCALE --
SHEET DESIGNATION G-41

0143G_V3_041_BORELOGS004

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI		2010	42	196

BORING B13 — Sheet 1 of 2

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B13 Sheet 1 of 2
Location (C/T): PAWTUCKET
RIDOT Database ID #:
RIC #: 2001-EB-003 FAP #: BRO-BCDR(009)
Date Start: 2/20/08 Date End: 2/20/08
Bridge/Road #: Bridge No. 550/ I-95
N Coord.: 287,866 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants
E Coord.: 359,411 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc.
Ground Surface Elev., Ft.: 14.1
Inspector Name/Co.: David Palleiko / Haley & Aldrich, Inc.
Elevation Datum: NGVD29

Methods Used to Determine Borehole Coordinates and Elevation:
2 / Survey

Drilling Firm: New Hampshire Boring, Inc. Project No.:
Drilling Foreman: Barry Wordell

Drilling Rig Make & Model: CME 75
Drilling Methods and Tools
Casing Size: 3 in Hollow Stem Auger ☐ Flight OD: ____ (in)
Methods Used to Advance Casing:
Driven (300 lbs) ☒ Push ☐ Roller Bit ☐ Spin ☐ Open Hole ☐
Drill Rod Size: ____ Wt./Ft. ____ (lbs)

Soils/Rock Sampling:
SPT Hammer Type Donut ☐ Safety ☒ Automatic Trip ☐ Other ____
Hammer Wt: 140 (lbs) Hammer Fall: 30 (in)
Split Spoon Sampler: Barrel Length: 24 Barrel ID: 1.375 (in) Barrel OD: 2 (in)
Shoe ID: 1.375 (in) Shoe OD: 2 (in)
Liner Type: Brass ☐ Stainless Steel ☐ Plastic ☐ Spring Core Catcher ☐
Undisturbed Samplers:
Shelby Tube: Length: ____ (in) ID/OD: ____ (in)
Fixed Piston Sampler Type Length: ____ (in) ID/OD: ____ (in)
Other: ____ Length: ____ (in) ID/OD: ____ (in)

Bedrock Core Barrel Type: Standard double tube ID/OD: 2/2.8 (in) Core Diameter: 2 (in)

Groundwater Monitoring: Well Screen Depth from: ____ (ft) to ____ (ft)

Soil/Rock Samples Delivered to:
Name: Haley & Aldrich, Inc. Date:
Address: One Davol Square, Providence, RI 02903

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

RIC #: 2001-EB-003
Boring No.: B13
Database ID No.:

BORING B14(OW) — Sheet 1 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B14(OW) Sheet 1 of 3
Location (C/T): PAWTUCKET
RIDOT Database ID #:
RIC #: 2001-EB-003 FAP #: BRO-BCDR(009)
Date Start: 2/20/08 Date End: 2/21/08
Bridge/Road #: Bridge No. 550/ I-95
N Coord.: 287,791 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants
E Coord.: 359,413 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc.
Ground Surface Elev., Ft.: 13.3
Inspector Name/Co.: David Palleiko / Haley & Aldrich, Inc.
Elevation Datum: NGVD29

Methods Used to Determine Borehole Coordinates and Elevation:
2 / Survey

Drilling Firm: New Hampshire Boring, Inc. Project No.:
Drilling Foreman: Barry Wordell

Drilling Rig Make & Model: CME 75
Drilling Methods and Tools
Casing Size: 3 in Hollow Stem Auger ☐ Flight OD: ____ (in)
Methods Used to Advance Casing:
Driven (300 lbs) ☒ Push ☐ Roller Bit ☐ Spin ☐ Open Hole ☐
Drill Rod Size: ____ Wt./Ft. ____ (lbs)

Soils/Rock Sampling:
SPT Hammer Type Donut ☐ Safety ☒ Automatic Trip ☐ Other ____
Hammer Wt: 140 (lbs) Hammer Fall: 30 (in)
Split Spoon Sampler: Barrel Length: 24 Barrel ID: 1.375 (in) Barrel OD: 2 (in)
Shoe ID: 1.375 (in) Shoe OD: 2 (in)
Liner Type: Brass ☐ Stainless Steel ☐ Plastic ☐ Spring Core Catcher ☐
Undisturbed Samplers:
Shelby Tube: Length: ____ (in) ID/OD: ____ (in)
Fixed Piston Sampler Type Length: ____ (in) ID/OD: ____ (in)
Other: ____ Length: ____ (in) ID/OD: ____ (in)

Bedrock Core Barrel Type: Standard double tube ID/OD: 2/2.8 (in) Core Diameter: 2 (in)

Groundwater Monitoring: Well Screen Depth from: 4.5 (ft) to 14.5 (ft)

Soil/Rock Samples Delivered to:
Name: Haley & Aldrich, Inc. Date:
Address: One Davol Square, Providence, RI 02903

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

RIC #: 2001-EB-003
Boring No.: B14(OW)
Database ID No.:

BORING B14(OW) — Sheet 3 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B14(OW) Sheet 3 of 3
Location (C/T): PAWTUCKET
RIDOT Database ID #:

Depth Ft.	Casing Blows/Ft.	Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
								BOTTOM OF EXPLORATION AT 29.5 FT	

REMARKS:

Proportions Used	Sampler Type	Cohesionless	Density	Cohesive	Consistency
trace 0 to 10%	SS - Split Spoon	0 - 10	Loose	0 - 4	Soft
little 10 to 20%	UT - Shelby Tube	10 - 30	Medium Dense	4 - 8	Firm
some 20 to 35%	UP - Fixed Position	30 - 50	Dense	8 - 15	Stiff
and 35 to 50%	C - Rock Core	50 +	Very Dense	15 - 30	Very Stiff
				30 +	Hard

140# Wt x 30" fall on 2" OD SS Sampler

RIC #: 2001-EB-003
Boring No.: B14(OW)
Date Completed: 2/21/08
Database ID No.:

BORING B15(OW) — Sheet 3 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B15(OW) Sheet 3 of 3
Location (C/T): PAWTUCKET
RIDOT Database ID #:
RIC #: 2001-EB-003 FAP #: BRO-BCDR(009)
Date Start: 2/25/08 Date End: 2/26/08
Bridge/Road #: Bridge No. 550/ I-95
N Coord.: 287,997
Design Consult Co.: Commonwealth Engineers & Consultants
E Coord.: 359,711
Geotech Consult Co.: Haley & Aldrich, Inc.
Ground Surface Elev., Ft.: 52.7
Inspector Name/Co.: Scott Shay / Haley & Aldrich, Inc.
Elevation Datum: NGVD29

Borehole Location Description: Top of slope, near existing Pier 3
Sampler: Unless otherwise noted, soil sampler consists of a 2 in. split spoon driven using a 140 lb hammer, 30 in fall.
Casing: Unless otherwise noted, casing is driven using 300 lb hammer, falling 24 in.
Casing Size: 4 in HS Auger

Groundwater Observations

Date	Time	Depth	Casing at	Stab. Time
02/25/08	13:05	6.1	21.5	0.6 hr
02/25/08	15:00	27.5	21	0.5 hr
02/26/08	07:10	29.8	21	16 hr

Casing Blows/Ft.	Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description	Depth of Stratum Change (ft)	Stratum Description	Remarks
	C-7	36/32 50%	31.0	(6) (6)	coated with secondary mineralization. Conglomerate shows elongated clasts. C-6: Similar to above C-7: Similar to above C-8: Similar to above		SILTSTONE AND CONGLOMERATE (continued)	3
	C-9	18/18	36.5 38.0	(7) (7)	C-9: Similar to above	38.0	BOTTOM OF EXPLORATION AT 38.0 FT	4
6 19	SS-1	24/13	0.0 2.0	13-15-17-15	Dense dark brown silty SAND, trace gravel, trace coarse sand-sized asphalt		FILL	
27 19 21 20 21	NR-0	24/0	4.0 6.0	8-11-11-10	No Recovery			
20 31 26 28 33	SS-2	24/10	9.0 11.0	8-14-13-8	Medium dense brown silty SAND, little fine gravel, wet from drilling			1
26 34 13 17 10	SS-3	24/4	14.0 16.0	8-5-5-6	Loose brown silty SAND with gravel-sized concrete pieces	18.0	ALLUVIAL DEPOSITS	
22 24	SS-4	18/14	19.0 20.5	13-6-100	Loose orange brown fine sandy SILT, trace weathered rock, highly oxidized, trace organics. Abrupt change in effort to drive split spoon at 20.3 ft.	20.3	TOP OF BEDROCK AT 20.3 FT SILTSTONE AND CONGLOMERATE	2
	C-5	60/53 50%	23.0 28.0	(5) (6) (5) (5) (5) (5)	C-5: Moderately hard to hard, fresh to moderately weathered, aphanitic to coarse-grained bedded SILTSTONE and CONGLOMERATE. Bedding moderate angle, extremely thin to medium thick. Primary joints bed parallel, dipping at low to moderate angle, very close to close, rough to planar, fresh to occasionally discolored, tight to open.			
	C-6	36/36 75%		(6) (6)	Secondary joints high angle, rough, stepped,			

REMARKS: 3. [illegible] overburden: excavation is planned only for overburden. Discussed placement of screen with E. Wood (Haley & Aldrich, Inc.) prior to installation. 2. Advanced roller bit ahead of casing from 19.0 to 23.0 ft after SS4.

Proportions Used: trace 0 to 10%, little 10 to 20%, some 20 to 35%, and 35 to 50%. Sampler Type: SS - Split Spoon, UT - Shelby Tube, UP - Fixed Position, C - Rock Core. 140# Wt x 30" fall on 2" OD SS Sampler: Cohesionless Density 0 - 10 Loose, 10 - 30 Medium Dense, 30 - 50 Dense, 50 + Very Dense; Cohesive Consistency 0 - 4 Soft, 4 - 8 Firm, 8 - 15 Stiff, 15 - 30 Very Stiff, 30 + Hard

RIC #: 2001-EB-003
Boring No.: B15(OW)
Date Completed: 2/26/08
Database ID No.:

BORING B13 — Sheet 2 of 2

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B13 Sheet 2 of 2
Location (C/T): PAWTUCKET
RIDOT Database ID #:
RIC #: 2001-EB-003 FAP #: BRO-BCDR(009)
Date Start: 2/20/08 Date End: 2/20/08
Bridge/Road #: Bridge No. 550/ I-95
N Coord.: 287,866 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants
E Coord.: 359,411 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc.
Ground Surface Elev., Ft.: 14.1
Inspector Name/Co.: David Palleiko / Haley & Aldrich, Inc.
Elevation Datum: NGVD29

Borehole Location Description: Taft Street
Sampler: Unless otherwise noted, soil sampler consists of a 2 in. split spoon driven using a 140 lb hammer, 30 in fall.
Casing: Unless otherwise noted, casing is driven using 300 lb hammer, falling 24 in.
Casing Size: 3 in HS Auger

Groundwater Observations

Date	Time	Depth	Casing at	Stab. Time

Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
					0.3	CONCRETE	1
SS-1	24/4	0.5 2.5	7-15-14-15	Medium dense olive brown silty medium to fine SAND, little fine gravel		FILL	
SS-2	24/2	4.0 6.0	7-6-7-7	Medium dense GRAVEL. Gravel jammed in spoon tip.			
SS-3	24/12	9.0 11.0	6-8-34-21	Dense olive gray with olive brown mottled medium to fine sandy GRAVEL, little silt, vague relict structure.	9.0	TOP OF BEDROCK AT 9.0 FT SANDSTONE AND CONGLOMERATE	
C-4	60/60 100%	11.5 16.5	(7) (8) (8) (8) (8)	C-4: Hard, fresh, light gray, fine to very coarse-grained SANDSTONE and CONGLOMERATE. Bedding thin to medium thick. No jointing discernible.			
C-5	36/36 100%	16.5 19.5	(7) (8) (7)	C-5: Hard, fresh, light gray, fine to very coarse-grained interbedded SANDSTONE and CONGLOMERATE. Bedding thin to medium thick. No jointing discernible.			
C-6	60/58 97%	19.5 24.5	(6) (6) (6) (6) (5)	C-6: Hard, fresh, light gray, fine to very coarse-grained interbedded SANDSTONE and CONGLOMERATE. Bedding thin to medium thick. No jointing discernible.			
C-7	24/24 100%	24.5 26.5	(5) (3)	C-7: Hard, fresh, light gray, fine to very coarse-grained interbedded SANDSTONE and CONGLOMERATE. Bedding thin to medium thick. No jointing discernible.	26.5	BOTTOM OF EXPLORATION AT 26.5 FT	

REMARKS: 1. Groundwater not recorded.

Proportions Used: trace 0 to 10%, little 10 to 20%, some 20 to 35%, and 35 to 50%. Sampler Type: SS - Split Spoon, UT - Shelby Tube, UP - Fixed Position, C - Rock Core. 140# Wt x 30" fall on 2" OD SS Sampler: Cohesionless Density 0 - 10 Loose, 10 - 30 Medium Dense, 30 - 50 Dense, 50 + Very Dense; Cohesive Consistency 0 - 4 Soft, 4 - 8 Firm, 8 - 15 Stiff, 15 - 30 Very Stiff, 30 + Hard

RIC #: 2001-EB-003
Boring No.: B13
Date Completed: 2/20/08
Database ID No.:

BORING B14(OW) — Sheet 3 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B14(OW) Sheet 3 of 3
Location (C/T): PAWTUCKET
RIDOT Database ID #:
RIC #: 2001-EB-003 FAP #: BRO-BCDR(009)
Date Start: 2/20/08 Date End: 2/21/08
Bridge/Road #: Bridge No. 550/ I-95
N Coord.: 287,791 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants
E Coord.: 359,413 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc.
Ground Surface Elev., Ft.: 13.3
Inspector Name/Co.: David Palleiko / Haley & Aldrich, Inc.
Elevation Datum: NGVD29

Borehole Location Description: Taft Street
Sampler: Unless otherwise noted, soil sampler consists of a 2 in. split spoon driven using a 140 lb hammer, 30 in fall.
Casing: Unless otherwise noted, casing is driven using 300 lb hammer, falling 24 in.
Casing Size: 3 in HS Auger

Groundwater Observations

Date	Time	Depth	Casing at	Stab. Time

Type & Number	Pen/Rec. Core Rec. & RQD	Depth (ft)	Blows per 6 in. (Coring min/ft) [Downpress psi]	Soil and Rock Sample Description (Haley & Aldrich Modified Burmister Soil and Rock Classification System)	Depth of Stratum Change (ft)	Stratum Description	Remarks
					0.3	CONCRETE	1
SS-1	24/6	0.5 2.5	4-5-5-5	Loose olive gray brown silty medium to fine SAND, little fine gravel		FILL	
SS-2	24/1	4.0 6.0	7-6-4-3	Loose olive gray silty fine SAND - limited recovery	7.0	GLACIOFLUVIAL DEPOSITS	
SS-3	24/3	9.0 11.0	19-19-11-13	Medium dense GRAVEL	13.0	GLACIAL TILL	
SS-4	6/4	14.0 14.5	19-50/0"	Dense olive gray silty medium to fine SAND, little fine gravel, weakly bonded in-situ	14.5	TOP OF BEDROCK AT 14.5 FT SILTSTONE AND SANDSTONE	
C-5	60/58 93%	14.5 19.5	(8) (8) (8) (8) (8)	C-5-C-7: Hard, fresh, gray green to purple, fine-grained interbedded SILTSTONE and SANDSTONE. Bedding moderate angle, thin to medium thick. Primary joint bed parallel, moderate angle, close to moderately spaced, smooth, occasionally slickensided, planar, fresh, tight. Secondary joints cross cut bedding, moderate angle, close to moderately spaced, smooth, planar, tight to open occasionally quartz healed. Single vug at 29.3 ft, 1 in. across with calcite crystals and iron staining.			
C-6	60/54 82%	19.5 24.5	(7) (8) (7) (8) (7)				
C-7	60/58 80%	24.5 29.5	(6) (6) (7) (8) (6)		29.5		

REMARKS: 1. Groundwater not recorded.

Proportions Used: trace 0 to 10%, little 10 to 20%, some 20 to 35%, and 35 to 50%. Sampler Type: SS - Split Spoon, UT - Shelby Tube, UP - Fixed Position, C - Rock Core. 140# Wt x 30" fall on 2" OD SS Sampler: Cohesionless Density 0 - 10 Loose, 10 - 30 Medium Dense, 30 - 50 Dense, 50 + Very Dense; Cohesive Consistency 0 - 4 Soft, 4 - 8 Firm, 8 - 15 Stiff, 15 - 30 Very Stiff, 30 + Hard

RIC #: 2001-EB-003
Boring No.: B14(OW)
Date Completed: 2/21/08
Database ID No.:

BORING B15(OW) — Sheet 1 of 3

RIDOT Project: Pawtucket Bridge No. 550 Replacement
BORING #: B15(OW) Sheet 1 of 3
Location (C/T): PAWTUCKET
RIDOT Database ID #:
RIC #: 2001-EB-003 FAP #: BRO-BCDR(009)
Date Start: 2/25/08 Date End: 2/26/08
Bridge/Road #: Bridge No. 550/ I-95
N Coord.: 287,997 Ft.
Design Consult Co.: Commonwealth Engineers & Consultants
E Coord.: 359,711 Ft.
Geotech Consult Co.: Haley & Aldrich, Inc.
Ground Surface Elev., Ft.: 52.7
Inspector Name/Co.: Scott Shay / Haley & Aldrich, Inc.
Elevation Datum: NGVD29

Methods Used to Determine Borehole Coordinates and Elevation:
2 / Survey

Drilling Firm: New Hampshire Boring, Inc. Project No.:
Drilling Foreman: Don Dunklee

Drilling Rig Make & Model: Acker AD II
Drilling Methods and Tools
Casing Size: 4 in Hollow Stem Auger ☐ Flight OD: ____ (in)
Methods Used to Advance Casing:
Driven (300 lbs) ☒ Push ☐ Roller Bit ☐ Spin ☐ Open Hole ☐
Drill Rod Size: ____ Wt./Ft. ____ (lbs)

Soils/Rock Sampling:
SPT Hammer Type Donut ☐ Safety ☒ Automatic Trip ☐ Other ____
Hammer Wt: 140 (lbs) Hammer Fall: 30 (in)
Split Spoon Sampler: Barrel Length: 24 Barrel ID: 1.375 (in) Barrel OD: 2 (in)
Shoe ID: 1.375 (in) Shoe OD: 2 (in)
Liner Type: Brass ☐ Stainless Steel ☐ Plastic ☐ Spring Core Catcher ☐
Undisturbed Samplers:
Shelby Tube: Length: ____ (in) ID/OD: ____ (in)
Fixed Piston Sampler Type Length: ____ (in) ID/OD: ____ (in)
Other: ____ Length: ____ (in) ID/OD: ____ (in)

Bedrock Core Barrel Type: Standard double tube ID/OD: 2/2.8 (in) Core Diameter: 2 (in)

Groundwater Monitoring: Well Screen Depth from: 10 (ft) to 20 (ft)

Soil/Rock Samples Delivered to:
Name: Haley & Aldrich, Inc. Date:
Address: One Davol Square, Providence, RI 02903

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

RIC #: 2001-EB-003
Boring No.: B15(OW)
Database ID No.:

HALEY & ALDRICH
HALEY & ALDRICH, INC.
465 Medford Street, Suite 2200
Boston, MA 02129-1400
Phone: 617.886.7400
Fax: 617.886.7600
HaleyAldrich.com

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT
PAWTUCKET BRIDGE NO. 550
PAWTUCKET, RHODE ISLAND

TEST BORINGS B13, B14, B15

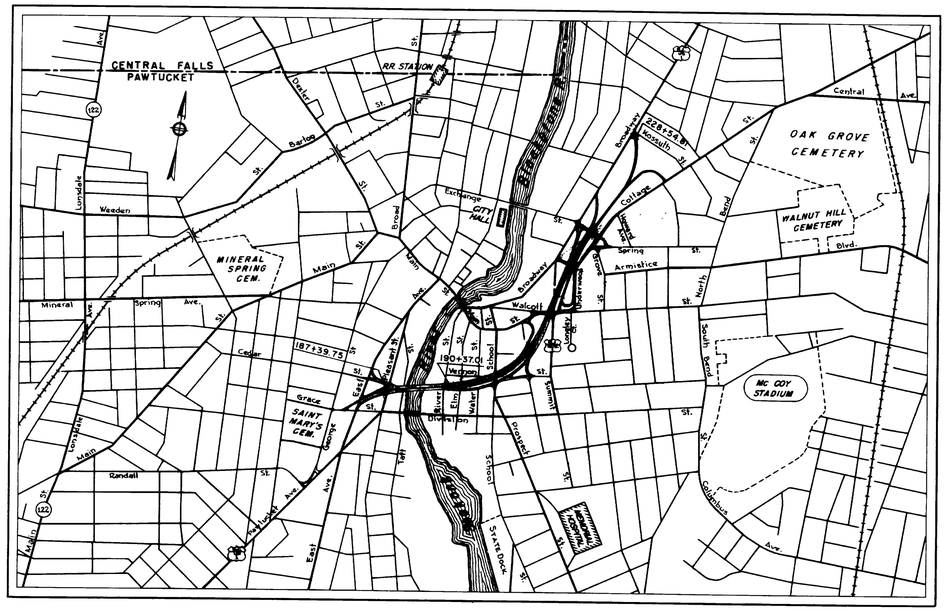
SCALE -- SHEET DESIGNATION G-42

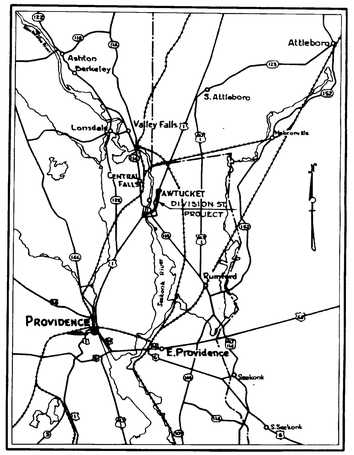
0143G_V3_042_BORELOGS005

FED. ROAD DIV. NO	STATE	FED. AID PROJ No.	FISCAL YEAR	SHEET NO.	SHEETS
1	R. I.				

STATE OF RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

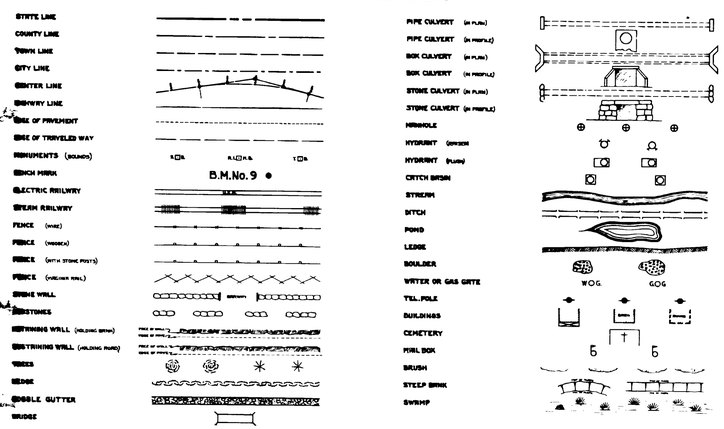
PLAN, PROFILE AND SECTIONS OF PROPOSED
STATE HIGHWAY





KEY PLAN

CONVENTIONAL SIGNS



DIVISION ST. PROJECT
CONTRACT THREE

R.I.F.A. PROJECT NO. I-01(11) LENGTH .723 MILES

LAYOUT

1000 500 0 1000 2000
SCALE OF FEET

SCALES OF DRAWINGS

Plans, - - 1 inch = 50 feet
Profiles, - - 1 inch = 40 feet Horizontal
" - - 1 inch = 4 feet Vertical
Cross Sections, 1 inch = 10 feet

BASE OF LEVELS

PAWTUCKET MEAN HIGH WATER

GRANT H. POTTER
No. 15
REGISTERED PROFESSIONAL ENGINEER

Contract Number 5753
Number of Sheet 1
Total Sheets 223

R. I. DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

APPROVED
PRINCIPAL HIGHWAY ENGINEER — DATE 4-25-57

APPROVED
PUBLIC WORKS CONTROLLER — DATE 4/26/57

APPROVED
DIRECTOR — DATE 4-29-57

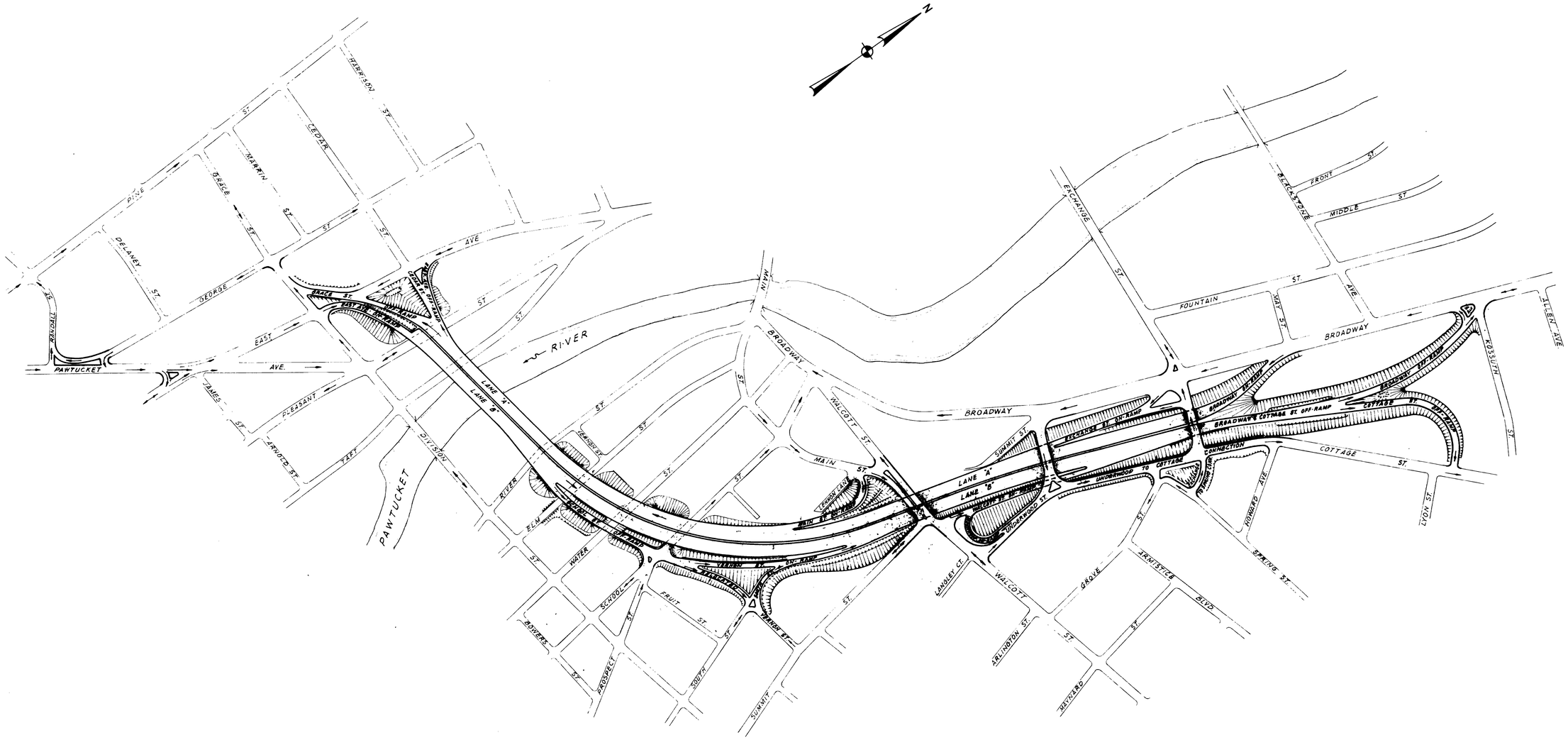
DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DISTRICT ENGINEER — DATE

M NOV 1 1 1955

FED ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R. I.	I-01-(11)	57	3	223



CONSTRUCTION CONTRACT THREE

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

DIVISION STREET PROJECT

R. I. PROJECT NO. I-01-(11)

PAWTUCKET RHODE ISLAND

GENERAL PLAN

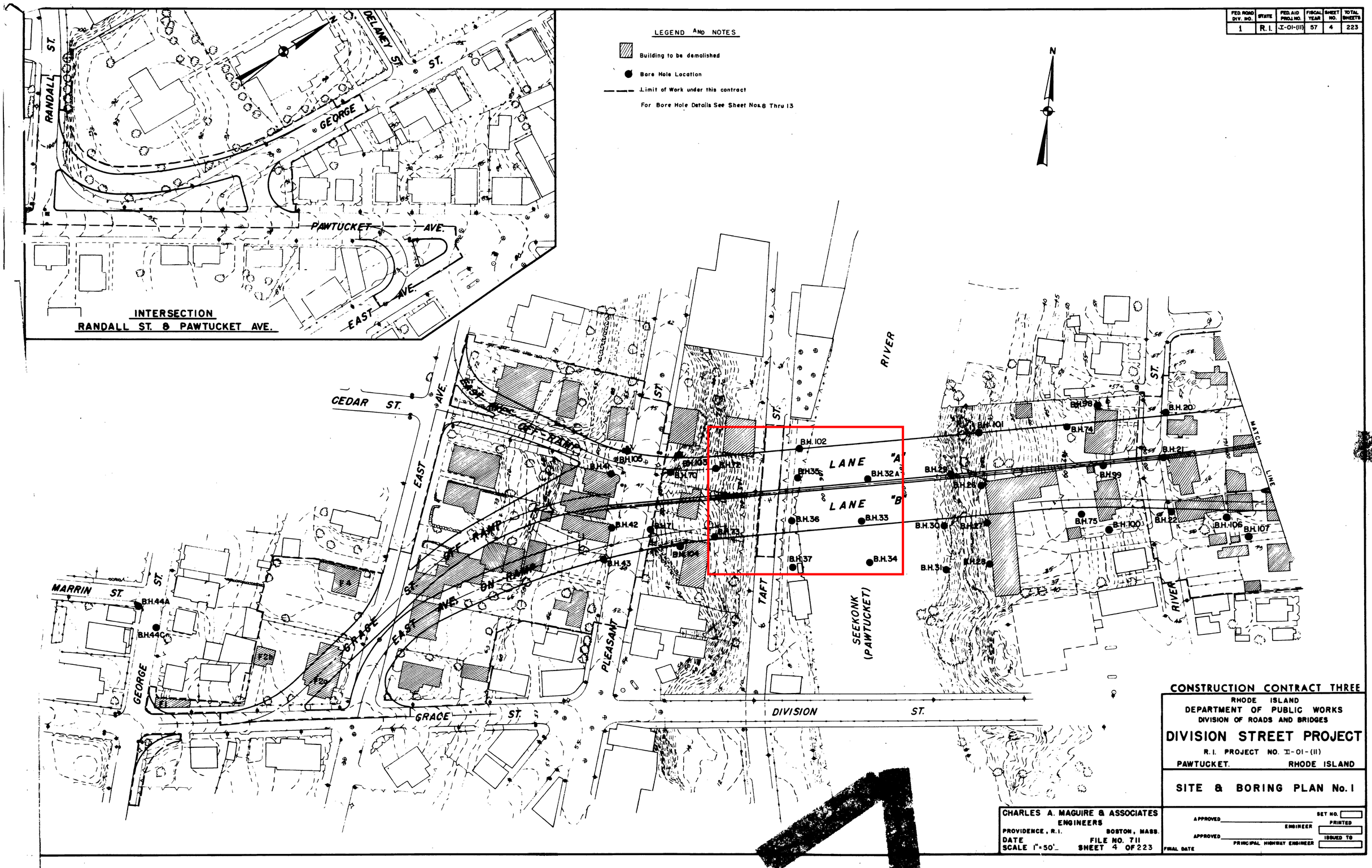
CHARLES A. MAGUIRE & ASSOCIATES
ENGINEERS
PROVIDENCE, R.I. BOSTON, MASS.
DATE FILE NO. 711
SCALE 1" = 200' SHEET 3 OF 223

APPROVED _____ ENGINEER
APPROVED _____ PRINCIPAL HIGHWAY ENGINEER
FINAL DATE.

SET NO.
PRINTED
ISSUED

M NOV 1 9 1955

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R.I.	X-01-(11)	57	4	223



CONSTRUCTION CONTRACT THREE

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

DIVISION STREET PROJECT

R.I. PROJECT NO. X-01-(11)

PAWTUCKET. RHODE ISLAND

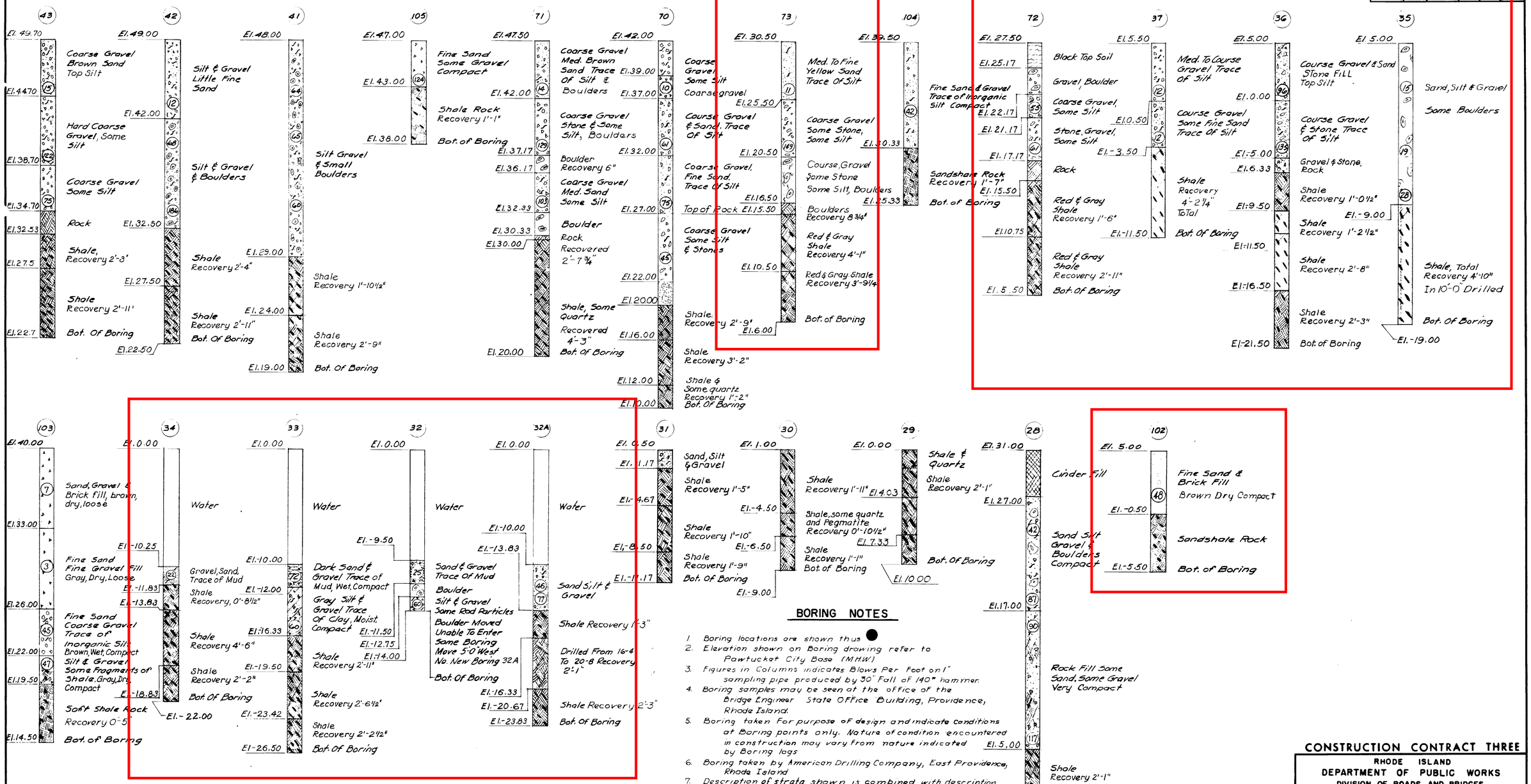
SITE & BORING PLAN No. 1

CHARLES A. MAGUIRE & ASSOCIATES
ENGINEERS
PROVIDENCE, R.I. BOSTON, MASS.
DATE FILE NO. 711
SCALE 1"=50' SHEET 4 OF 223

APPROVED _____ ENGINEER
APPROVED _____ PRINCIPAL HIGHWAY ENGINEER
FINAL DATE

SET NO. ____
PRINTED ____
ISSUED TO ____

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R.I.	I-01-(11)	57	8	223



BORING NOTES

1. Boring locations are shown thus ●
2. Elevation shown on Boring drawing refer to Pawtucket City Base (MHW)
3. Figures in Columns indicates Blows Per Foot on 1" sampling pipe produced by 30" Fall of 140" hammer.
4. Boring samples may be seen at the office of the Bridge Engineer State Office Building, Providence, Rhode Island.
5. Boring taken For purpose of design and indicate conditions at Boring points only. Nature of condition encountered in construction may vary from nature indicated by Boring logs
6. Boring taken by American Drilling Company, East Providence, Rhode Island
7. Description of strata shown is combined with description of individual samples recovered.
8. Where ground water level is shown it indicates the Elev. of groundwater at the time boring was taken and does not necessarily indicate the elev. of ground water at present
9. For boring legend see sheet no. 9.

CONSTRUCTION CONTRACT THREE

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

DIVISION STREET PROJECT

R.I. PROJECT NO. I-01-(11)

PAWTUCKET RHODE ISLAND

PAWTUCKET BRIDGE BORINGS — SHEET 1

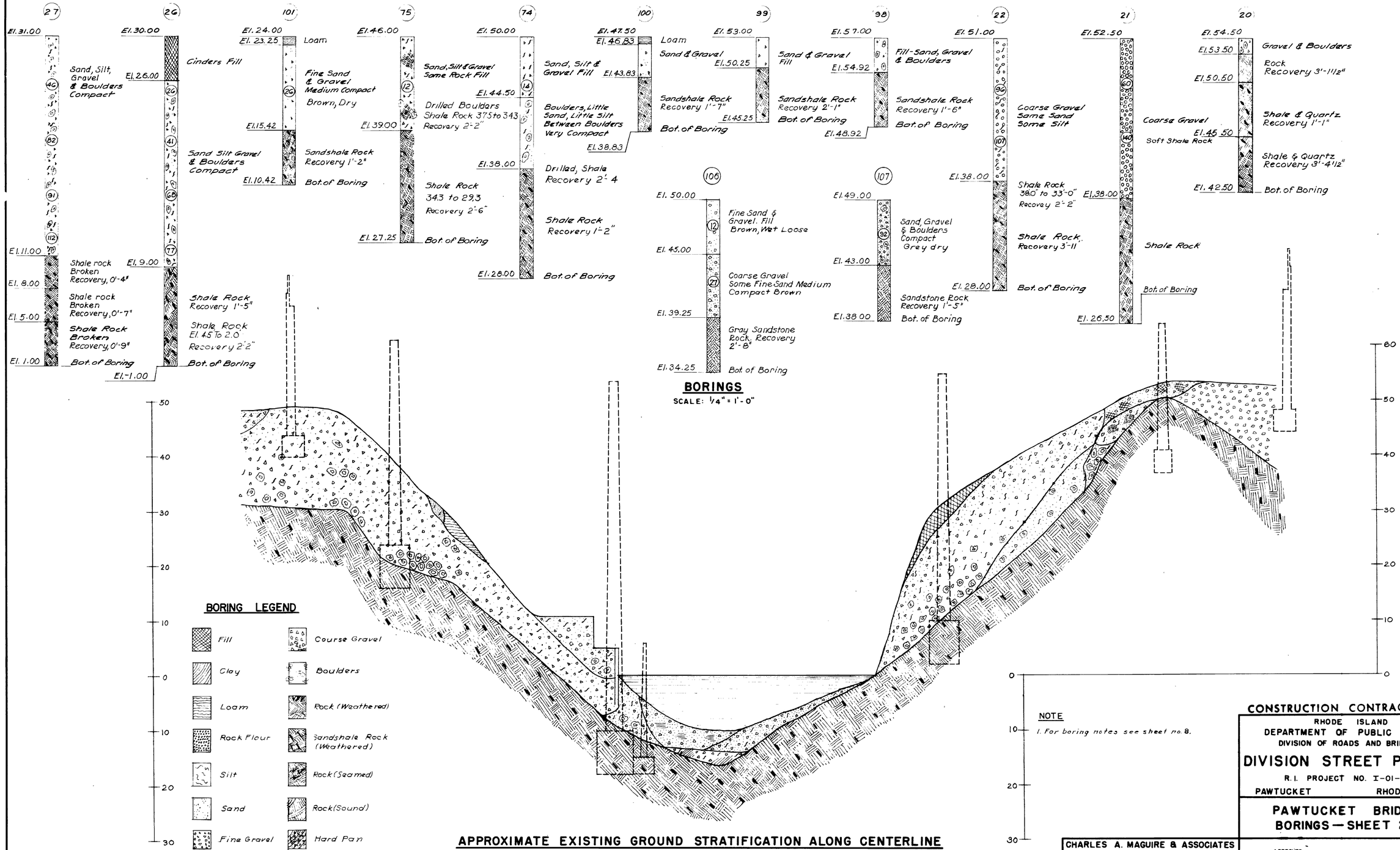
CHARLES A. MAGUIRE & ASSOCIATES
ENGINEERS
PROVIDENCE, R.I. BOSTON, MASS.
DATE FILE NO. 711
SCALE: ¼" = 1'-0" SHEET 8 OF 223

APPROVED ENGINEER
APPROVED PRINCIPAL HIGHWAY ENGINEER
FINAL DATE

SET NO.
PRINTED
ISSUED TO

M NOV 1 1958

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R. I.	I-01-(11)	57	9	223



NOTE

1. For boring notes see sheet no. 8.

CONSTRUCTION CONTRACT THREE

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

DIVISION STREET PROJECT

R. I. PROJECT NO. I-01-(11)

PAWTUCKET RHODE ISLAND

PAWTUCKET BRIDGE BORINGS — SHEET 2

CHARLES A. MAGUIRE & ASSOCIATES
ENGINEERS
PROVIDENCE, R.I. BOSTON, MASS.
DATE FILE NO. 711
SCALE: AS NOTED SHEET 9 OF 223

APPROVED _____ ENGINEER
APPROVED _____ PRINCIPAL HIGHWAY ENGINEER
FINAL DATE

SET NO.
PRINTED
ISSUED TO

M NOV 1 0 1958

Taft St. – Pleasant St. Branch Interceptor

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION

PROVIDENCE, RHODE ISLAND

TAFT ST.-PLEASANT ST. BRANCH INTERCEPTER SECTION B

INLET CHAMBER DETAILS FOUND IN THIS CONTRACT..."18"

CONTRACT DRAWINGS

CONTRACT 18

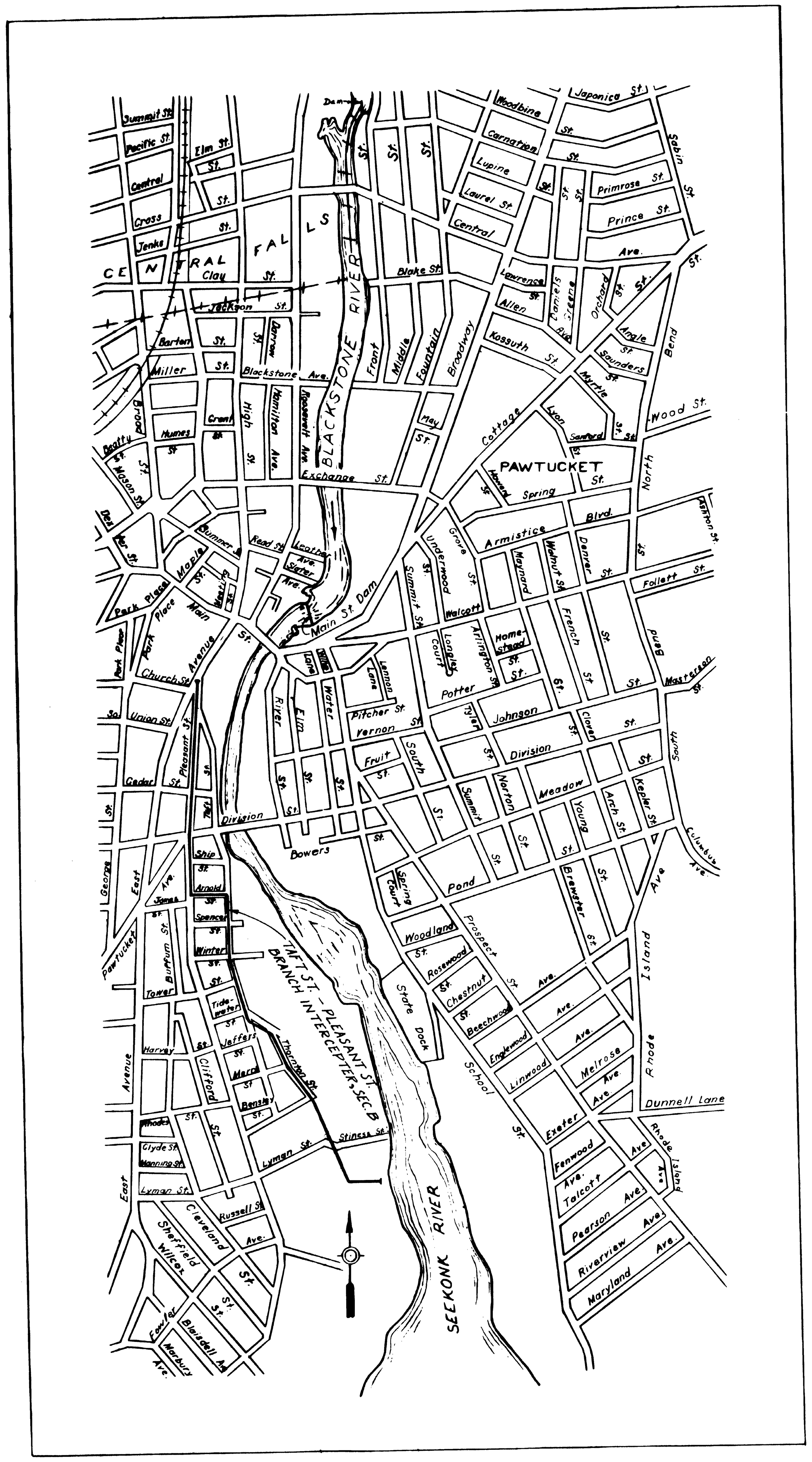
1950

HONORABLE JOHN O. PASTORE, GOVERNOR

WILLIAM J. HALLORAN	CHAIRMAN
LUIGI SCALA	FIRST VICE CHAIRMAN
HAROLD J. CREEDON	SECOND VICE CHAIRMAN
PHILIP S. MANCINI	EX - OFFICIO
EDWARD A. McLAUGHLIN, M.D.	EX - OFFICIO
ANGELO A. BONVICIN	EXECUTIVE SECRETARY
CHARLES G. HAMMANN	CHIEF ENGINEER

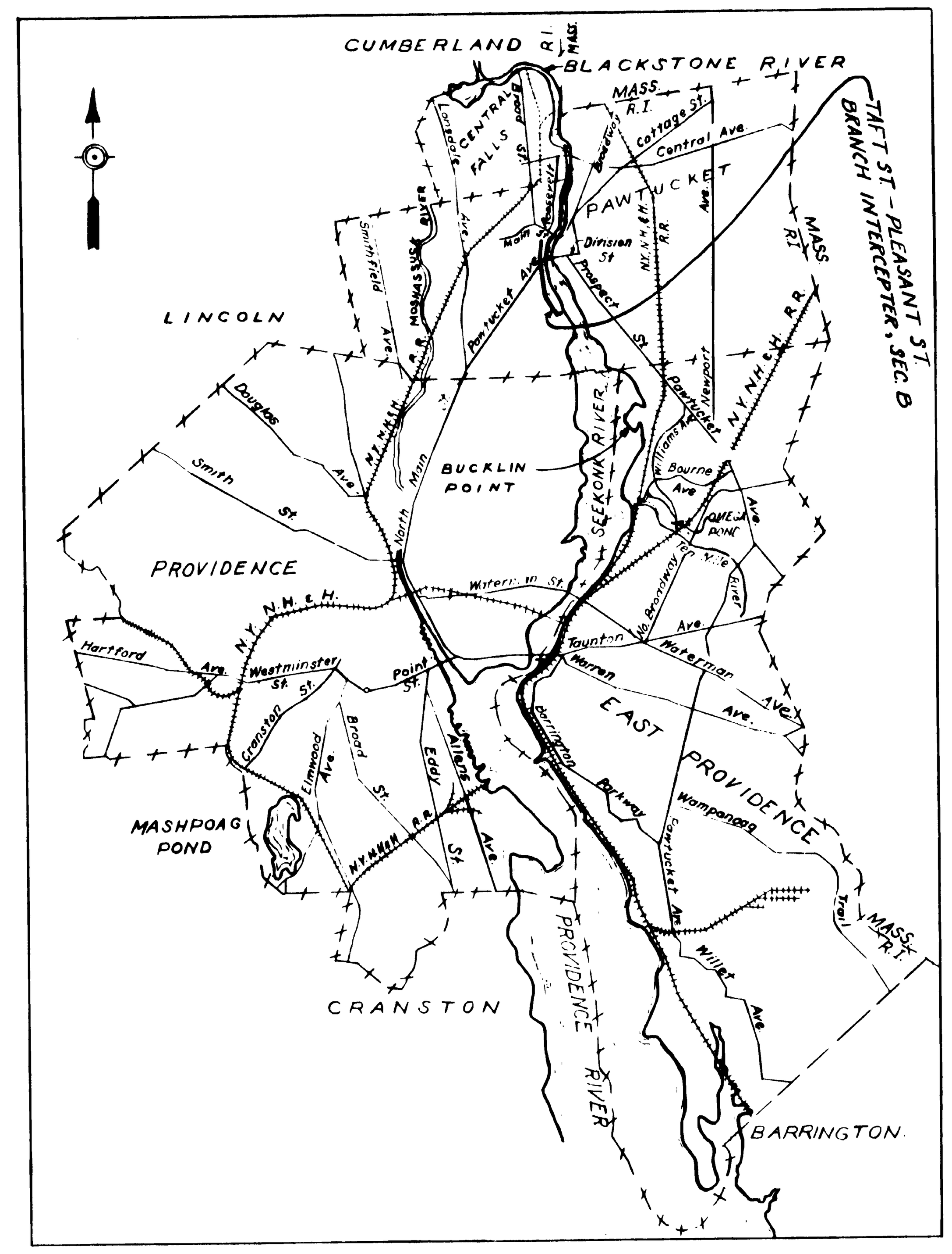
METCALF & EDDY
ENGINEERS
BOSTON, MASS.

28111
H
21662



VICINITY PLAN

SCALE: 1" = 600'



LOCATION MAP

SCALE: 1" = 6000'

LIST OF DRAWINGS

SHEET NO.	TITLE	
1	VICINITY PLAN AND LOCATION MAP - LIST OF DRAWINGS	
2	PLAN AND PROFILE - STA. 7+00± TO STA. 12+00	
3	" " " STA. 12+00 TO STA. 24+00	
4	" " " STA. 24+00 TO STA. 36+00	
5	" " " STA. 36+00 TO STA. 48+00	
6	" " " STA. 48+00 TO STA. 54+37.74	
7	BYPASS CONDUIT	
8	SEWER AND TRENCH SECTIONS - UNDERDRAIN DETAILS	
9	MANHOLE DETAILS	
10	MISCELLANEOUS DETAILS	
11	SIPHON INLET STRUCTURE -	PART I OF V
12	" " "	PART II OF V
13	" " "	PART III OF V
14	" " "	PART IV OF V
15	" " "	PART V OF V
16	JUNCTION CHAMBER AT LYMAN ST. -	PART I OF II
17	" " " " "	PART II OF II
18	MERRY ST. SEWER CONNECTION -	PART I OF II
19	" " " "	PART II OF II
20	TIDEWATER ST. SEWER CONNECTION -	PART I OF II
21	" " " "	PART II OF II
22	PLEASANT ST. SEWER CONNECTION -	PART I OF II
23	" " " "	PART II OF II
24	EAST AVENUE SEWER CONNECTION -	PART I OF II
25	" " " "	PART II OF II
26	JUNCTION CHAMBER AT PLEASANT ST.	

RECORD PLAN

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION
PROVIDENCE, RHODE ISLAND

TAFT ST.-PLEASANT ST.
BRANCH INTERCEPTER
SECTION B

VICINITY PLAN AND LOCATION MAP
LIST OF DRAWINGS

SCALE: AS SHOWN — OCTOBER 1950

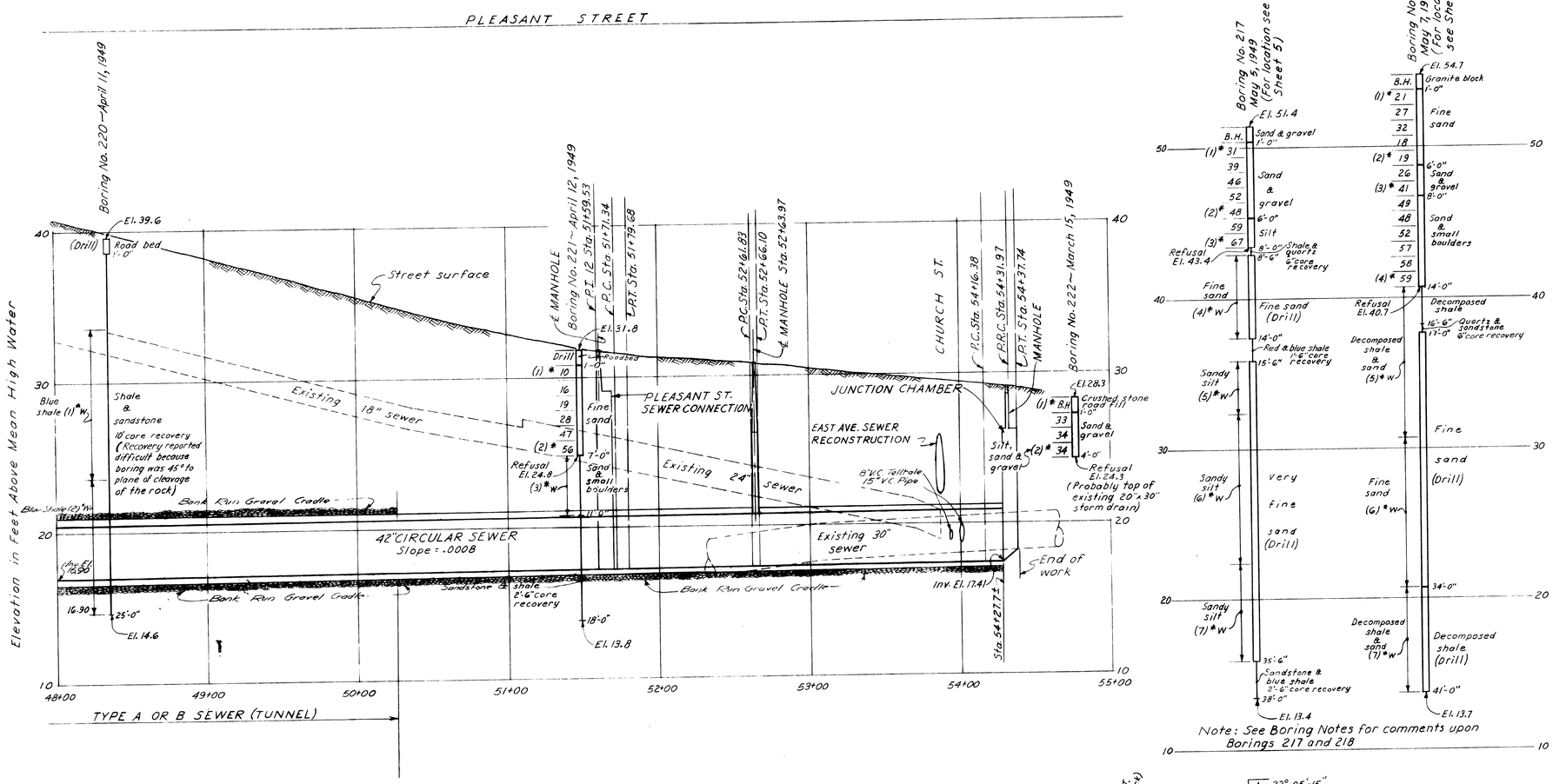
METCALF & EDDY
ENGINEERS
BOSTON, MASS.

23912
H
11182

APPROVED
FOR METCALF & EDDY, ENGINEERS
R. I. REG. PROF. ENGR. NO. 353 — DATE

DRAWN BY C.K.W.
TRACED BY W.S. - D.W.S.
CHECKED BY D.M.R.

CONTRACT 18 — SHEET 1 OF 26



BORING AND BAR SOUNDING NOTES

An asterisk (*) indicates a point at which a sample of material was taken from the boring. The figure adjacent to the asterisk, in parentheses, is the sample number. "B.H." indicates that the sample was taken "by hand", without use of a spoon. "Drill" means that the boring within the indicated limits was made by diamond drill rather than by the wash-boring method (see Table below showing diamond-drill borings made). "W" means that the sample was obtained by catching the wash-water in a bucket or jar as it left the casing during drilling operations, the sample being composed of materials carried by the wash-water.

The other figures alongside the boring, at 1'-0" intervals, indicate the penetration, this being the number of blows required to drive an open-end 2" diameter spoon into the material a distance of 1'-0" at the point where the penetration was measured, using a 140-lb. weight falling through a distance of approximately 2'-6", ahead of the washing.

"Refusal" at the borings was reported when 50 or more blows of the weight on the spoon produced zero penetration.

Bar soundings were made by driving into the ground a $1\frac{3}{4}$" round iron bar, made up of sections threaded together, driven by dropping a 300-lb. weight on it. The bar had a wedge-shaped chopping bit. "Refusal" at the bar soundings was reported when additional penetration of the iron bar into the ground could not be obtained.

Bar sounding T-7 made at Sta. 11+88 ± is not shown because Sounding T-7A, located about 3'-0" away, penetrated several feet deeper. Sounding T-7 was made by manually driving into the ground a pointed 1" round iron bar by use of an 8-lb. sledge hammer. "Refusal" was reported at elevation 20.4 at this sounding.

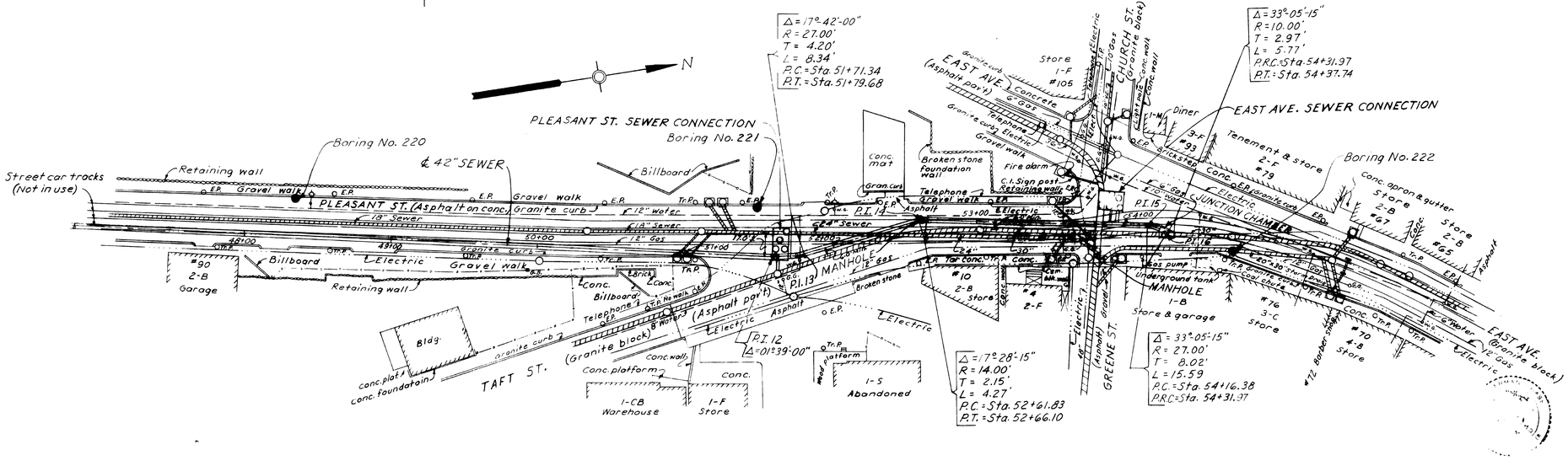
Borings 217 and 218 were considered to be erroneous or misleading because the material reported to be "fine sand" was removed by diamond drill rather than by wash-boring method. Borings 217A and 218A were thereupon made nearby, using wash-boring methods where possible, with the result that Borings 217 and 218 were shown to be possibly incorrect in indicating "fine sand" at certain elevations. Therefore Borings 217A and 218A are shown on the profile, Sheet 5, rather than Borings 217 and 218.

No guarantee is given as to the character of the material encountered in any boring, nor is any guarantee given that borings or bar soundings represent the true character of the material which will be excavated or which will underlie the proposed structures or that groundwater conditions will be as stated.

For additional information upon borings and bar soundings, including information upon groundwater, see the "Information for Bidders."

TABLE SHOWING DIAMOND-DRILL BORINGS MADE

Boring No.	Diamond-drill boring, depth from ground surface	
	From	To
206 A	15'-0"	16'-0"
	26'-0"	48'-0"
216	14'-0"	24'-8"
	35'-7"	36'-0"
217	8'-0"	38'-0"
217 A	12'-0"	13'-0"
	16'-0"	17'-0"
	19'-0"	41'-0"
218	14'-0"	41'-0"
218 A	6'-0"	7'-0"
	11'-0"	12'-0"
	14'-0"	15'-0"
	20'-0"	44'-0"
219	9'-0"	33'-0"
220	0'-0"	25'-0"
221	0'-0"	1'-0"
	7'-0"	18'-0"



APPROVED	
FOR METCALF & EDDY, ENGINEERS	
R. L. REG. PROF. ENGR. NO. 353	DATE 18-27-50

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION
PROVIDENCE, RHODE ISLAND

TAFT ST.-PLEASANT ST. BRANCH INTERCEPTER
SECTION B
PLAN AND PROFILE
STA. 48 + 00 TO STA. 54 + 37.74

SCALE: HOR. 1" = 40' VERT. 1" = 4'

OCTOBER 1950

RECORD DRAWING
MARCH, 1953. E.K.

METCALF & EDDY
ENGINEERS
BOSTON, MASS.

DRAWN BY F.T.Q.
TRACED BY E.T.Q.
CHECKED BY F.C.T., C.F.J.

CONTRACT 18 SHEET 6 OF 20

Phase IIIA-5 Historic Data

Pawtucket Tunnel RFP GDR

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-41

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 5/3/2018
FINISH 5/4/2018
DRILLER NEBC
LOGGED BY HMS
CHECKED BY SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	4	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile B-53
Bit Type: 3 7/8" Tricone
Drill Fluid: Water
Casing: 4"
Hoist/Hammer: Automatic Hammer

ELEVATION 12.8
DATUM NGVD 1929
NORTHING 287414.433
EASTING 359504.663
LOCATION Taft Street near Division Street Bridge

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	12.8									
		X							Approximately 9" Pavement.	9" PAVEMENT
		10	9-10-12-72 (22)	S-1	15 / 24	0.75 - 2.75	SW-SM		A: Wet, medium dense, brown, fine to coarse SAND and fine to coarse GRAVEL, little silt. B: Wet, very dense, purple/brown, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	1A: PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs. 1B: PID = 0.0 ppm
		18								
			146	S-2	0 / 6	2.75 - 3.25			No Recovery.	
		97								
5	7.8	X	28-9-7-3 (16)	S-3	8 / 24	4 - 6	GW		Wet, medium dense, purple/brown, fine to coarse GRAVEL, some fine to coarse sand, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	3-3-4-7 (7)	S-4	5 / 24	6 - 8	GW		Wet, loose, brown, coarse GRAVEL, some fine gravel, little fine to coarse sand, trace silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	3-2-7-17 (9)	S-5	5 / 24	8 - 10	SW-SM		Wet, loose, brown, fine to coarse SAND and fine coarse GRAVEL, little silt.	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
10	2.8	X								
		X	6-3-8-19 (11)	S-6	3 / 24	10 - 12	GW		Wet, medium dense, brown, coarse GRAVEL, little fine to coarse sand, trace silt, trace fine gravel.	PID = 0.0 ppm
		X								
		X	14-10-16-18 (26)	S-7	13 / 24	12 - 14	GW-GM		Wet, medium dense, brown, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	PID = 0.0 ppm
		X								
15	-2.2	X	22-23-33-39 (56)	S-8	11 / 24	14 - 16	GW		Wet, very dense, tan/gray, fine to coarse GRAVEL, little fine to coarse sand, trace silt, trace clay. (Possible weathered Sandstone)	PID = 0.0 ppm
		X								
			27-56-87-51 (143)	S-9	19 / 24	16 - 18	SW		A: Wet, very dense, gray, fine to coarse SAND, some fine gravel, trace silt, trace coarse gravel. B: Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND, little silt. (Possible weathered Sandstone)	PID = 0.0 ppm
			103/4"	S-10	2 / 4	18 - 18.3			Wet, very dense, gray, weathered SANDSTONE recovered as fine to coarse gravel, trace fine to coarse sand, trace silt.	PID = 0.0 ppm

Bottom of borehole at 18.30 feet.

WATER LEVEL DATA			
	DEPTH (ft.) TO:		
DATE/TIME	BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. No casing blows for the first foot. NEBC set and reset casing to make sure casing was plum.
2. Used 140 lb. hammer for casing blows from 2'-4'.
3. Starting at 4', NEBC used the kelly and weight of the drilling to advance casing.
4. NEBC determined weathered bedrock began at approximately 18.3'. NEBC advanced roller bit to competent rock at approximately 21.1'.
5. "X" within casing blows indicates blows were not counted at that interval.

TEST BORING REPORT - GINT STD US LAB.GDT - 8/6/19 11:11 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-41

CORE BORING REPORT

PROJECT NO. 13:308.00D/14106.02

DEPTH (ft)	DRILL RATE (min/ft)	RUN NO.	DEPTH (ft)	ELEV. (ft)	REC (in/%)	RQD (in/%)	DISCON (#/ft)	GRAPHIC LOG	STRAT. DEPTH	VISUAL DESCRIPTION AND REMARKS	DISCONTINUITIES Depth (ft)	Type	Apt (mm)	Dip Angle	Rgh	Wea	Infill
15.0																	
15.5																	
16.0																	
16.5																	
17.0																	
17.5																	
18.0																	
18.5										Weathered Rock - No Sample Taken							
19.0																	
19.5																	
20.0																	
20.5																	
21.0																	
21.5	2.5	C-1	21.1 - 25	-8.3 - -12.2	47 100%	37 79%	1		21.1	Strong, gray, conglomeratic SANDSTONE, massive, fresh. - Quartz vein at 21.5', 5 mm±. - Quartz vein at 22.1', 3 mm±. - Quartz vein at 22.2', 2 mm±.	21.3	J	1	45	SR	F	None
22.0	4.75										22.0	J	1	55	R	SW	Fe
22.5							3				22.5	J	1	45	SM	F	None
23.0	2.5										22.7	J	1	45	SM	F	None
23.5	2.75						1		23.0	Strong, gray/blue, fine to coarse SANDSTONE interlaminated with Siltstone, fresh. - Bedding planes at 40°-50°.	23.3	B	1	45	SM	F	None
24.0																	
24.5	1.5						ECF (4±)				24.0	B	1	45	SR	F	None
											24.2	B	1	40	SM	SW	Fe
											24.7	B	1	45	SR	SW	Sl
											24.8-24.9	ECF	-	-	SR	SW	Fe
25.0							7										
25.5										**Bottom of borehole at 25.0 feet.**							
26.0																	
26.5																	
27.0																	
27.5																	
28.0																	
28.5																	
29.0																	
29.5																	
30.0																	

REMARKS:
1. Dip angles are measured from horizontal (i.e., perpendicular to the core axis).
2. Wash color white.
3. Flush return blocked at approximately 22.8'. Driller moved casing up and down to unblock.
4. Boring was backfilled with cement bentonite grout from 25.0 feet to the ground surface. No groundwater monitoring well was installed.

WATER LEVEL DATA

DATE/TIME	BOT. OF SOIL CASING (ft)	BOT. OF HOLE (ft)	WATER

GROUND SURFACE EL. 12.8

Note: Refer to the key sheets within the Geotechnical Design Report for the description of rock classification system codes.

CORE BORING REPORT - CORE BORING REPORT.GDT - 8/6/19 11:27 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 CORE BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-42

TEST BORING REPORT

PROJECT NAME Narragansett Bay Commission Phase III CSO Program
CLIENT NBC/Stantec
CONTRACTOR New England Boring Contractors, Inc.

PROJECT NO. 13:308.00D/14106.02
START 5/4/2018
FINISH 5/7/2018
DRILLER NEBC
LOGGED BY HMS
CHECKED BY SJM

	CASING	SAMPLER	BARREL
Type	Steel	Split Spoon	HQ3
Inside Diameter (in.)	4	1 3/8	2 3/8
Hammer Weight (lb.)	140	140	N/A
Hammer Fall (in.)	30	30	N/A

DRILLING EQUIPMENT & PROCEDURES
Rig Make & Model: Mobile B-53
Bit Type: 3 7/8" Tricone
Drill Fluid: Water
Casing: 4"
Hoist/Hammer: Automatic Hammer

ELEVATION 42.9
DATUM NGVD 1929
NORTHING 285819.753
EASTING 359764.101
LOCATION Taft Street at Merry Street

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
0	42.9									
		X					N/A		Approximately 8" Pavement	8" PAVEMENT
		X	18-18-21-30 (39)	S-1	19 / 24	0.67 - 2.67	SP-SM		Moist, dense, brown, fine to coarse SAND and fine to coarse GRAVEL, trace silt. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (3) VOAs.
		X								
		X	25-20-23	S-2	15 / 18	2.67 - 4	SW		Moist, dense, brown, fine to coarse SAND and fine to coarse GRAVEL, trace silt. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
5	37.9	X	21-28-29-27 (57)	S-3	16 / 24	4 - 6	SW		Moist, very dense, brown, fine to coarse SAND, some fine gravel, little coarse gravel, trace silt. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs.
		X								
		X	34-27-25-30 (52)	S-4	34 / 24	6 - 8	SW		Moist/wet, very dense, brown, fine to coarse SAND, some fine to coarse gravel, trace silt. (FILL)	PID = 0.0 ppm Environmental sample taken. (1) 8 oz. Amber, (2) VOAs. Water at approximately 7.5'.
		X	32-41-25-104/2"	S-5	14 / 20	8 - 10	GW-GM		A: Wet, very dense, brown, fine to coarse SAND and fine GRAVEL, trace silt. (FILL)	PID = 0.0 ppm 2" of fill then strata change. 1' boulder at approximately 10'.
10	32.9	X					GW-GM		B: Wet, very dense, brown, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	
		71								
		57								
		108								
		82								
15	27.9	X	49-71-103/1"	S-6	8 / 13	14 - 15.1	GW		Wet, very dense, brown, fine to coarse GRAVEL, little fine to coarse sand, trace silt.	PID = 0.0 ppm Boulder at approximately 15'1", weathered rock in tip.
		X								Wash color brown advanced roller bit through boulder to approximately 17'.
		X								
		X	20-12-18-16 (30)	S-7	11 / 24	17 - 19	GP		Wet, medium dense/dense, tan, coarse GRAVEL, some fine gravel, little fine to coarse sand, trace silt.	PID = 0.0 ppm
		X								
20	22.9	X	23-21-14-25 (35)	S-8	15 / 24	19 - 21	GW		Wet, dense, tan, fine to coarse GRAVEL and some fine to coarse SAND, trace silt.	PID = 0.0 ppm
		58								
		81	19-25-104/1"	S-9	7 / 13	21 - 22.1	GM		Wet, very dense, tan, fine to coarse GRAVEL and fine to coarse SAND, little silt.	PID = 0.0 ppm Obstruction at ~22'.
		X								
		X								
25	17.9		82/2"	S-10	1 / 2	24 - 24.2	SW		Wet, very dense, tan, fine to coarse SAND and fine GRAVEL, trace coarse gravel, trace silt.	PID = 0.0 ppm

WATER LEVEL DATA

DATE/TIME	DEPTH (ft.) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION
O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

REMARKS:
1. NEBC attempted a sample at 26'; however, the spoon was bouncing and did not advance.
2. "X" within casing blows indicates that blows were not counted at that interval.

(Continued Next Page)

TEST BORING REPORT - GINT STD US LAB.GDT - 8/15/19 10:16 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B17-42

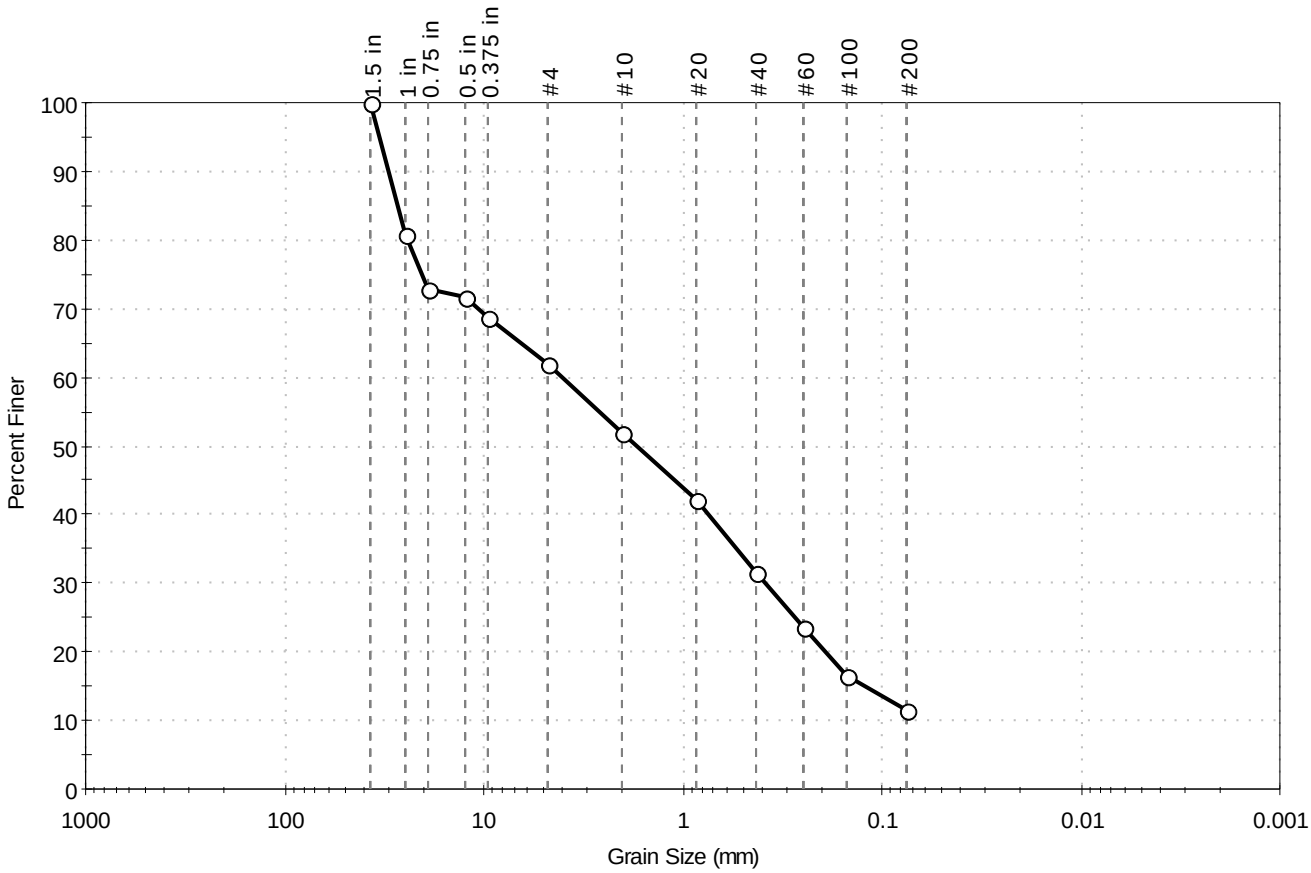
TEST BORING REPORT

DEPTH (ft)	ELEVATION (ft)	CASING BLOWS	SPT	SAMPLE NO.	REC (in) / PEN (in)	SAMPLE DEPTH (ft)	USCS SYMBOL	GRAPHIC LOG	VISUAL-MANUAL IDENTIFICATION & DESCRIPTION (Density/consistency, color, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	DRILLING NOTES
25	17.9									
			50/0"	S-11	0 / 0	26 - 26			**Bottom of borehole at 26.00 feet.**	

TEST BORING REPORT - GINT STD US LAB.GDT - 8/15/19 10:16 - Y:\JOBS\14 JOBS\14106.02 NBC PHASE III CSO CER-RI\PHASE III FIELD WORK\BORING LOGS\14106.02 BORING LOGS.GPJ

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-41	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-1A	Test Date:	05/29/18	Checked By:	emm
Depth :	0.75-2.75	Test Id:	456243		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	38.2	50.2	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	81		
0.75 in	19.00	73		
0.5 in	12.50	72		
0.375 in	9.50	69		
#4	4.75	62		
#10	2.00	52		
#20	0.85	42		
#40	0.42	32		
#60	0.25	24		
#100	0.15	17		
#200	0.075	12		

Coefficients

D_{85} = 27.3599 mm D_{30} = 0.3803 mm
D_{60} = 4.0503 mm D_{15} = 0.1202 mm
D_{50} = 1.6817 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

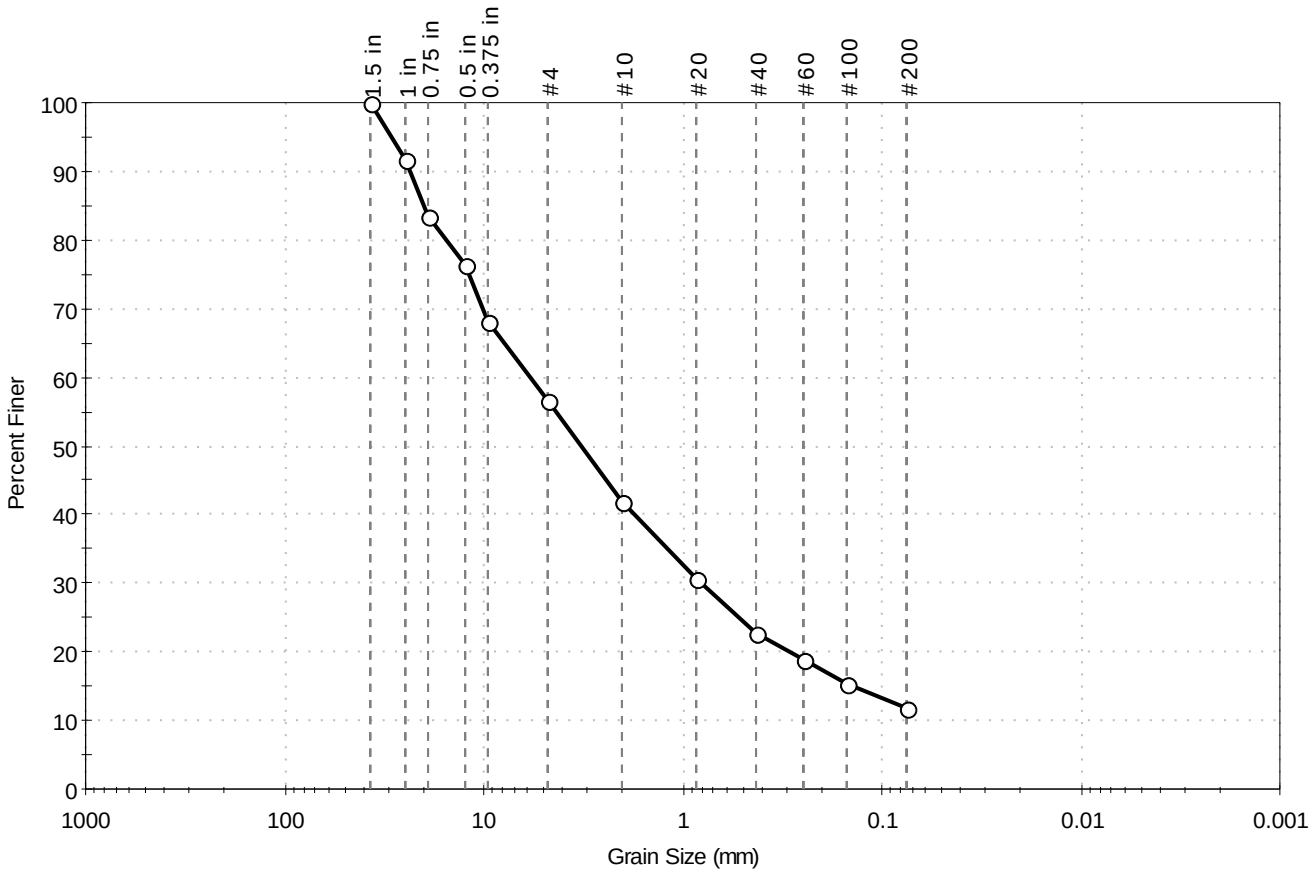
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:50 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-41	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-5	Test Date:	05/29/18	Checked By:	emm
Depth :	8-10	Test Id:	456244		
Test Comment:	---				
Visual Description:	Moist, dark brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	43.2	45.0	11.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	92		
0.75 in	19.00	84		
0.5 in	12.50	77		
0.375 in	9.50	68		
#4	4.75	57		
#10	2.00	42		
#20	0.85	31		
#40	0.42	23		
#60	0.25	19		
#100	0.15	15		
#200	0.075	12		

Coefficients

D_{85} = 19.9511 mm D_{30} = 0.8089 mm

D_{60} = 5.8038 mm D_{15} = 0.1408 mm

D_{50} = 3.2100 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-a (0))

Sample/Test Description

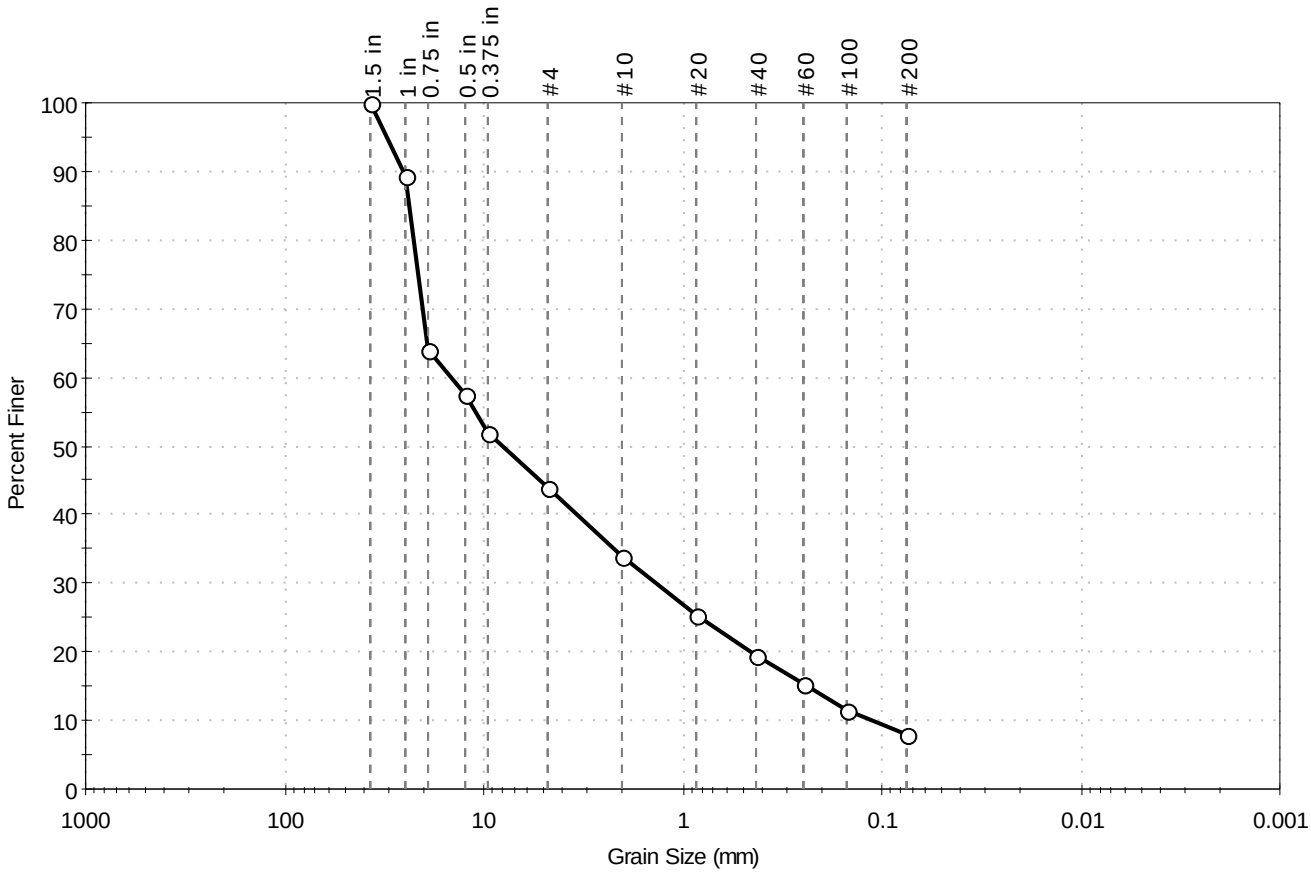
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:50 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-41	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-7	Test Date:	06/14/18	Checked By:	emm
Depth :	12-14	Test Id:	457944		
Test Comment:	---				
Visual Description:	Moist, redish dark gray gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	56.2	35.8	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	89		
0.75 in	19.00	64		
0.5 in	12.50	58		
0.375 in	9.50	52		
#4	4.75	44		
#10	2.00	34		
#20	0.85	25		
#40	0.42	19		
#60	0.25	15		
#100	0.15	12		
#200	0.075	8.0		

Coefficients

D_{85} = 23.8175 mm D_{30} = 1.3494 mm
D_{60} = 14.6163 mm D_{15} = 0.2358 mm
D_{50} = 8.0521 mm D_{10} = 0.1103 mm
C_u = 132.514 C_c = 1.129

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

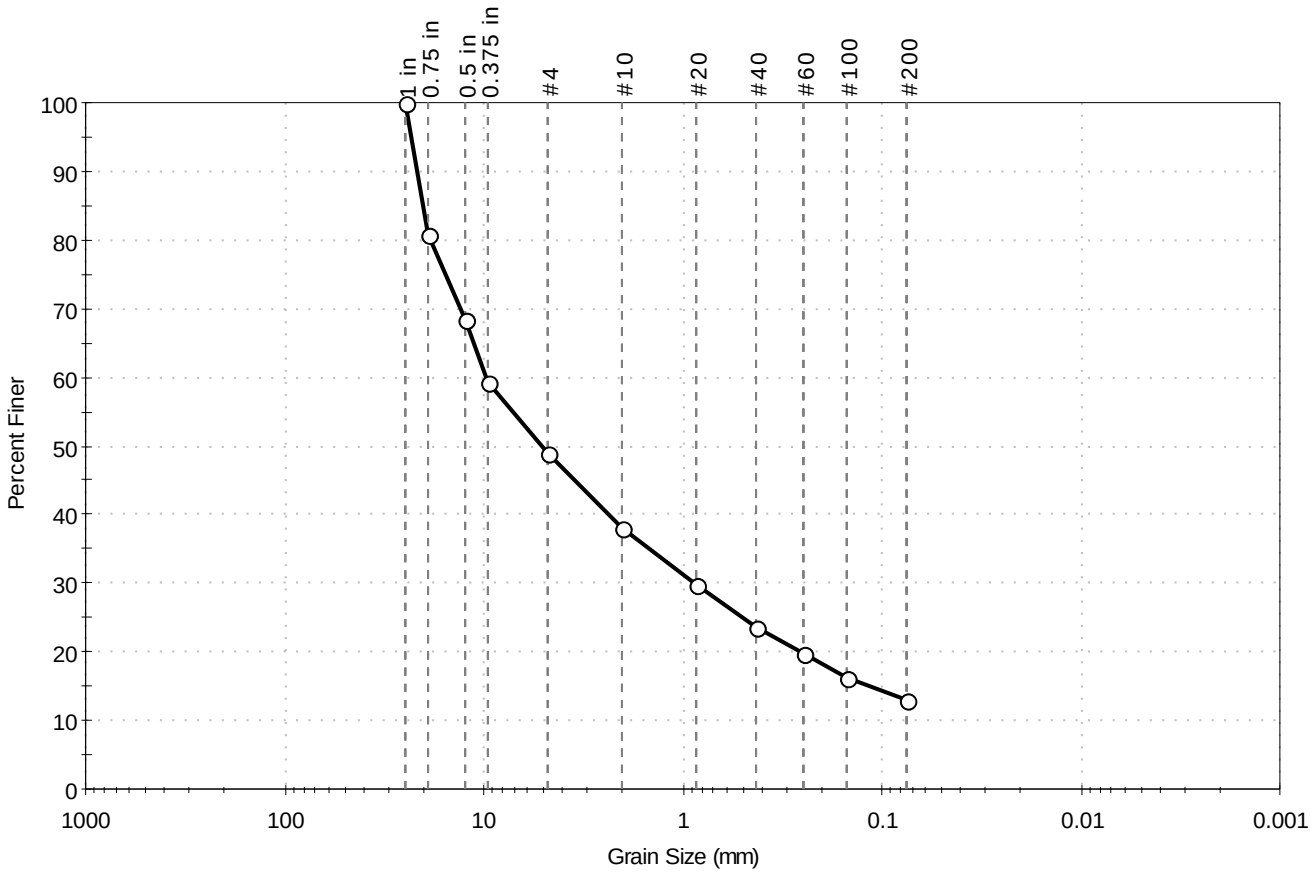
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/2/2018 12:51:26 PM

Client:	Pare Corporation		
Project:	NBC Phase III -Sewer Overflow		
Location:	Pawtucket, RI	Project No:	GTX-307508
Boring ID: B17-41	Sample Type: jar	Tested By:	jbr
Sample ID: S-9B	Test Date: 05/29/18	Checked By:	emm
Depth : 16-18	Test Id: 456245		
Test Comment:	---		
Visual Description:	Moist, light olive gray silty gravel with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	51.1	36.0	12.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	81		
0.5 in	12.50	68		
0.375 in	9.50	59		
#4	4.75	49		
#10	2.00	38		
#20	0.85	30		
#40	0.42	24		
#60	0.25	20		
#100	0.15	16		
#200	0.075	13		

Coefficients

D_{85} = 20.1677 mm	D_{30} = 0.8700 mm
D_{60} = 9.6751 mm	D_{15} = 0.1153 mm
D_{50} = 5.1114 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-a (0))

Sample/Test Description

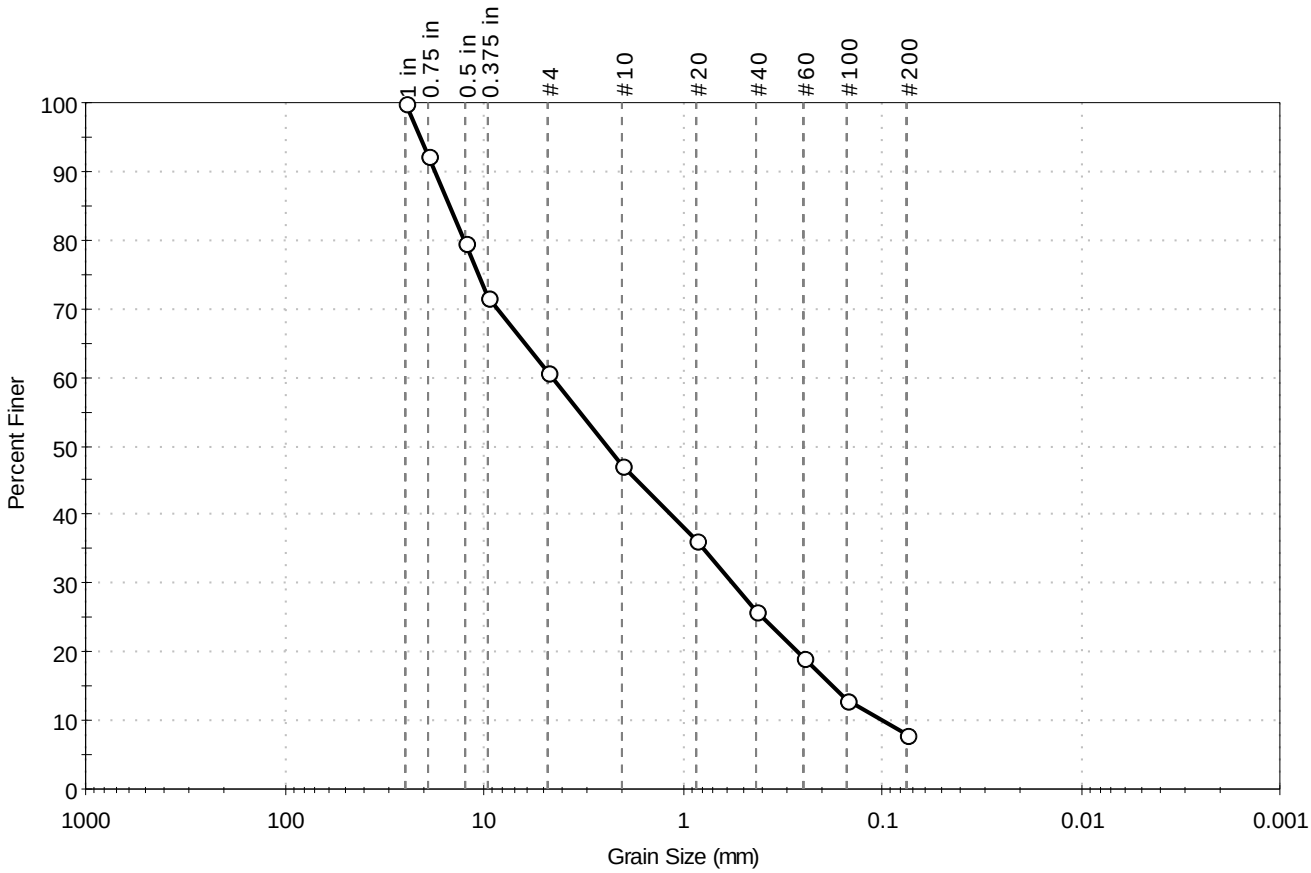
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:50 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-42	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-1	Test Date:	05/29/18	Checked By:	emm
Depth :	0.67-2.67	Test Id:	456246		
Test Comment:	---				
Visual Description:	Moist, light gray sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	39.2	52.7	8.1

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	80		
0.375 in	9.50	72		
#4	4.75	61		
#10	2.00	47		
#20	0.85	36		
#40	0.42	26		
#60	0.25	19		
#100	0.15	13		
#200	0.075	8.1		

Coefficients

D_{85} = 14.9320 mm	D_{30} = 0.5566 mm
D_{60} = 4.5062 mm	D_{15} = 0.1770 mm
D_{50} = 2.3731 mm	D_{10} = 0.0980 mm
C_u = 45.982	C_c = 0.702

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

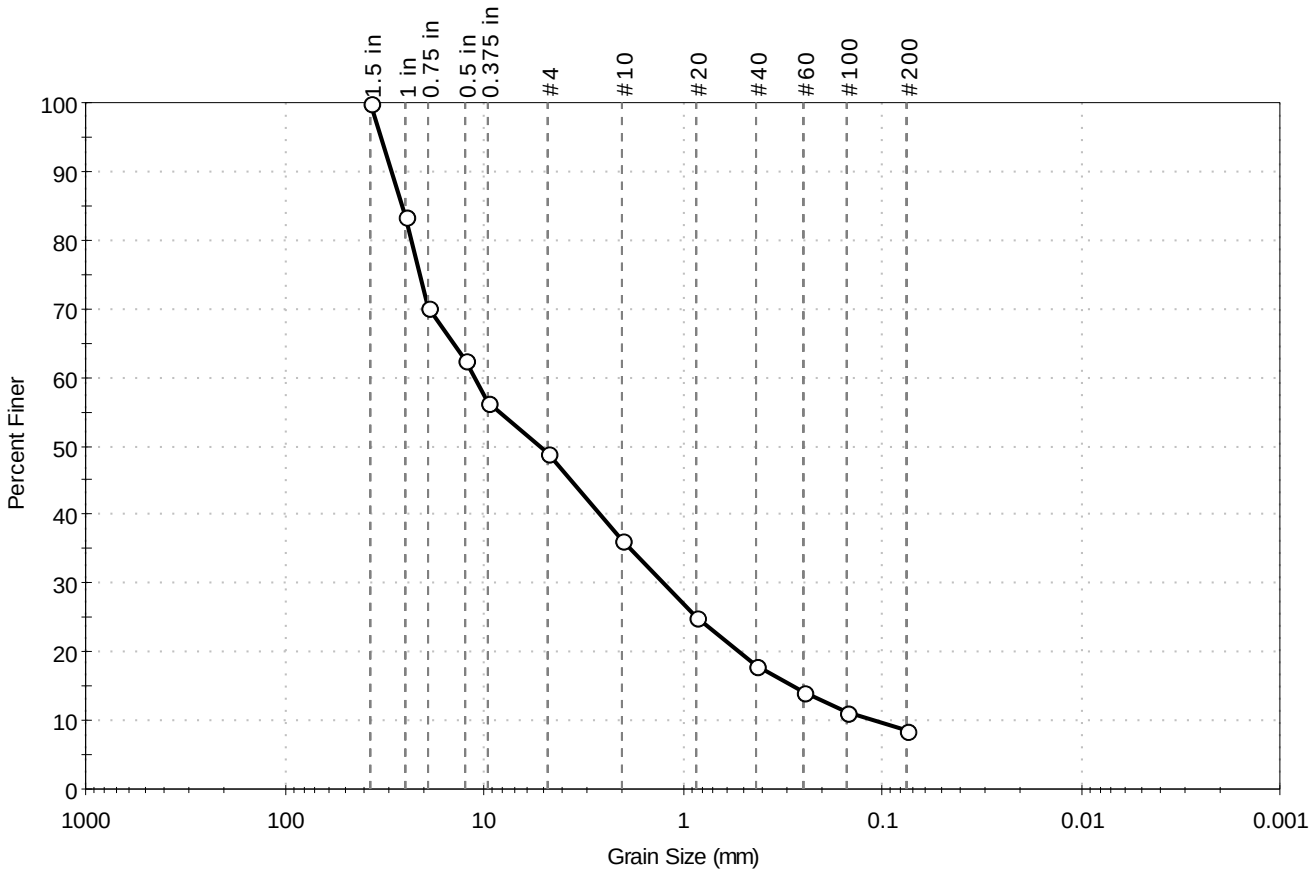
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:51 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-42	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-5B	Test Date:	05/29/18	Checked By:	emm
Depth :	8-10	Test Id:	456247		
Test Comment:	---				
Visual Description:	Moist, gray gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	51.0	40.5	8.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	83		
0.75 in	19.00	70		
0.5 in	12.50	63		
0.375 in	9.50	56		
#4	4.75	49		
#10	2.00	36		
#20	0.85	25		
#40	0.42	18		
#60	0.25	14		
#100	0.15	11		
#200	0.075	8.5		

Coefficients

D_{85} = 25.9391 mm D_{30} = 1.2400 mm
D_{60} = 11.1117 mm D_{15} = 0.2785 mm
D_{50} = 5.1885 mm D_{10} = 0.1093 mm
C_u = 101.662 C_c = 1.266

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

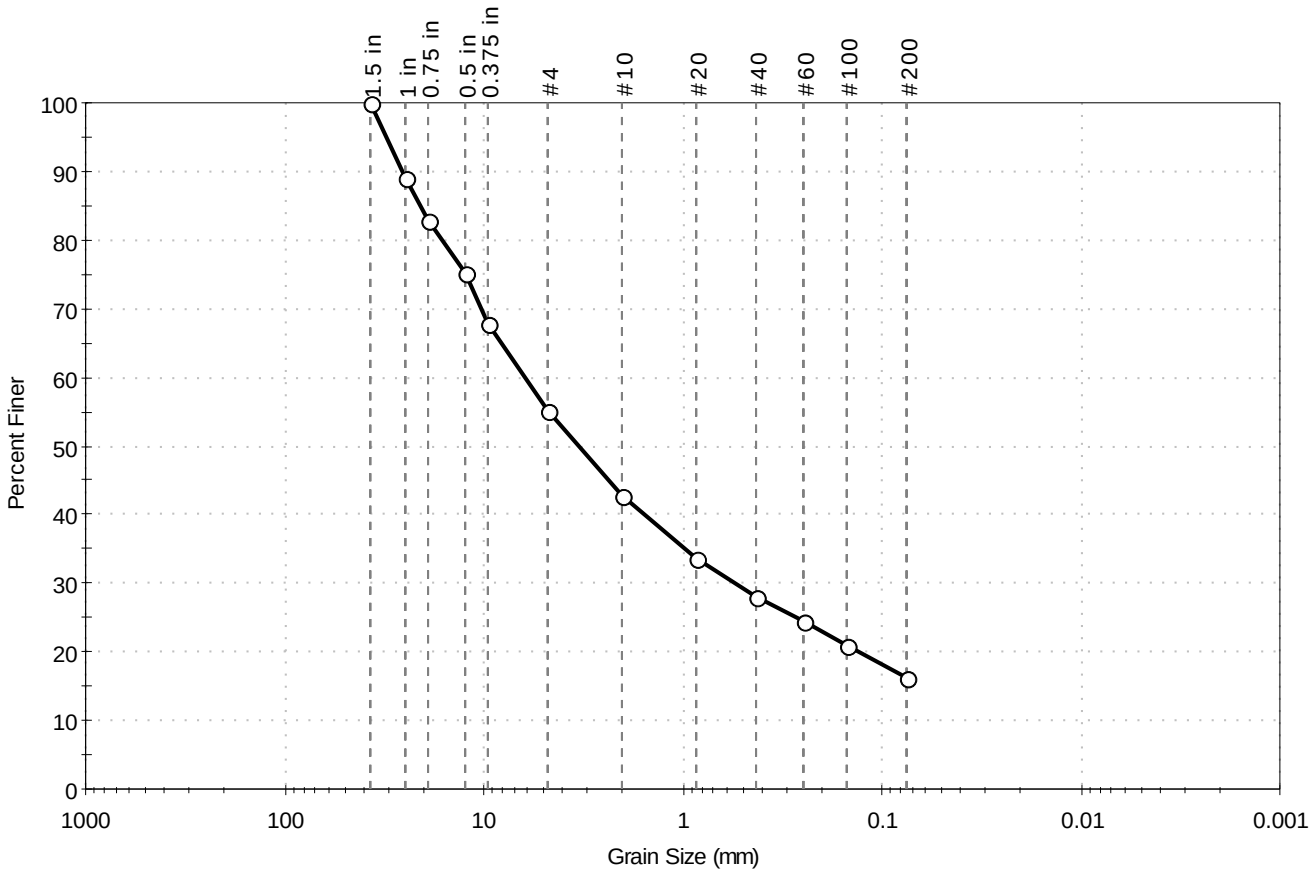
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:51 AM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-42	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-8	Test Date:	06/14/18	Checked By:	emm
Depth :	12-14	Test Id:	457945		
Test Comment:	---				
Visual Description:	Moist, pinkish gray silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	44.8	39.0	16.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	89		
0.75 in	19.00	83		
0.5 in	12.50	75		
0.375 in	9.50	68		
#4	4.75	55		
#10	2.00	43		
#20	0.85	34		
#40	0.42	28		
#60	0.25	25		
#100	0.15	21		
#200	0.075	16		

Coefficients

D_{85} = 20.7323 mm D_{30} = 0.5392 mm

D_{60} = 6.1742 mm D_{15} = N/A

D_{50} = 3.3205 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

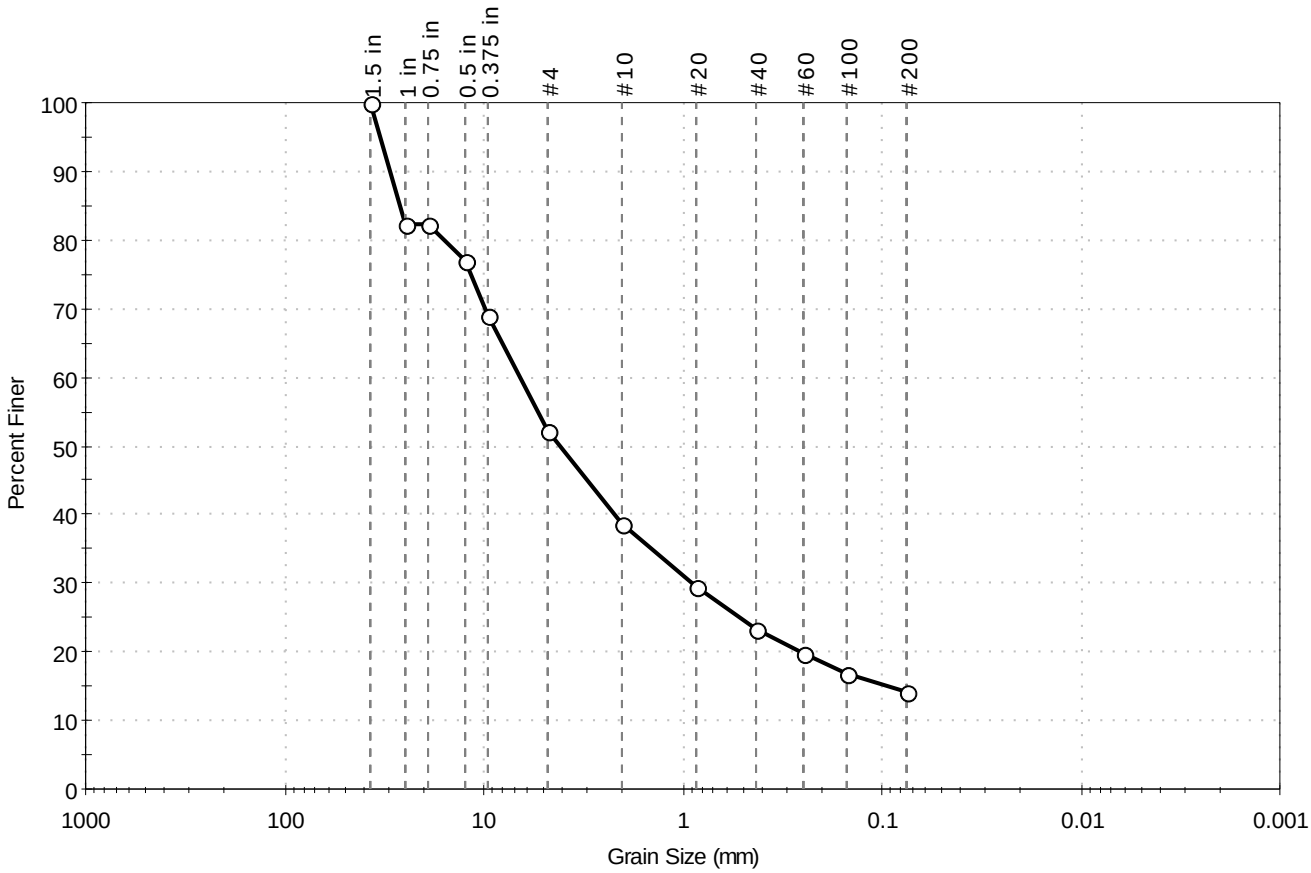
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 8/2/2018 12:51:27 PM

Client:	Pare Corporation				
Project:	NBC Phase III -Sewer Overflow				
Location:	Pawtucket, RI			Project No:	GTX-307508
Boring ID:	B17-42	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-9	Test Date:	05/29/18	Checked By:	emm
Depth :	21-22.1	Test Id:	456248		
Test Comment:	---				
Visual Description:	Moist, brownish gray silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	47.7	38.2	14.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	82		
0.75 in	19.00	82		
0.5 in	12.50	77		
0.375 in	9.50	69		
#4	4.75	52		
#10	2.00	39		
#20	0.85	29		
#40	0.42	23		
#60	0.25	20		
#100	0.15	17		
#200	0.075	14		

Coefficients

D_{85} = 26.6542 mm D_{30} = 0.8957 mm

D_{60} = 6.5487 mm D_{15} = 0.0931 mm

D_{50} = 4.1062 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-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 6/1/2018 10:44:52 AM

HAGER-RICHTER
GEOSCIENCE, INC.

SEISMIC REFRACTION SURVEY
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW PROJECT
PAWTUCKET MAIN TUNNEL SECTION
PAWTUCKET, RHODE ISLAND

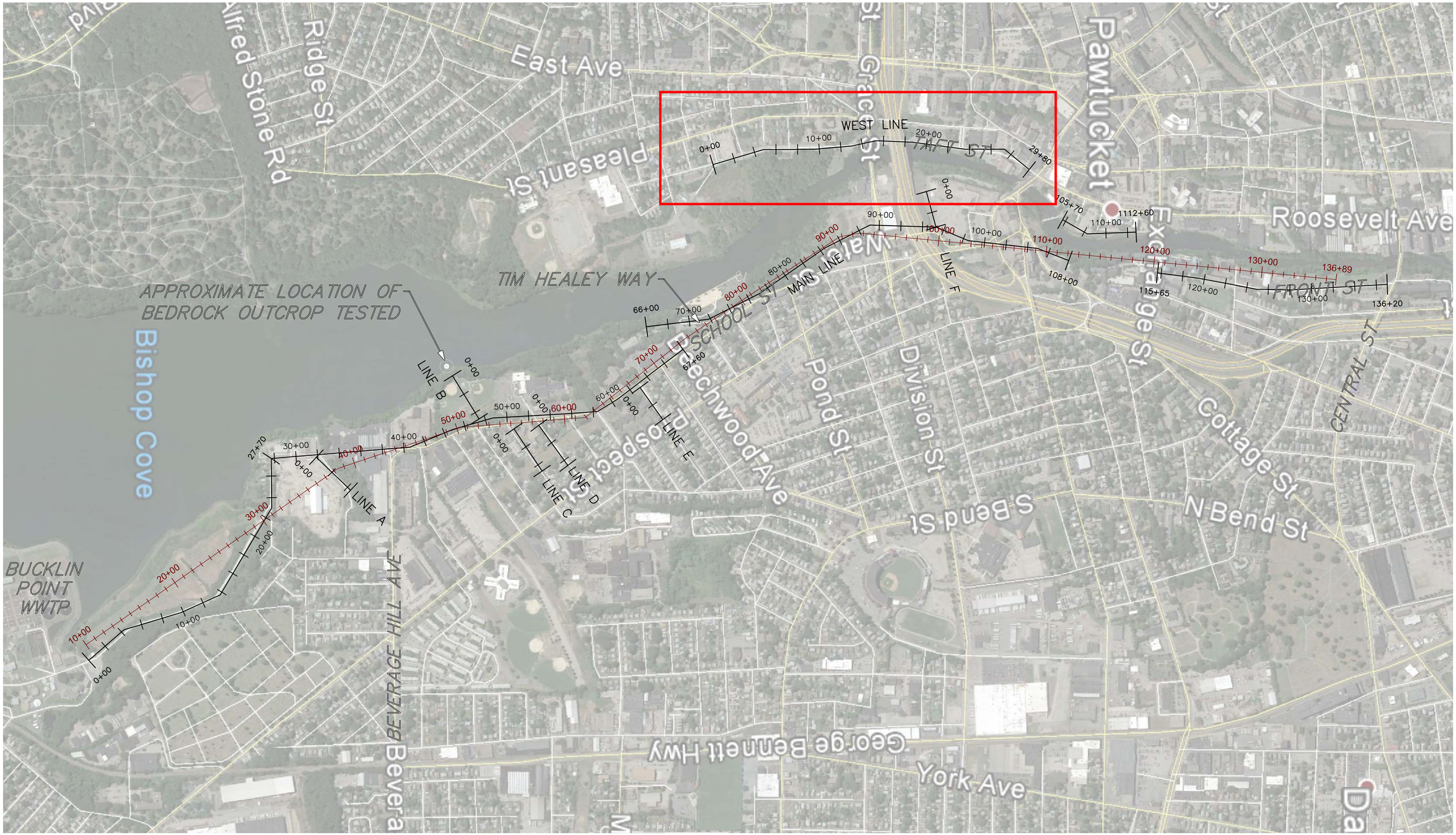
Prepared for:

Stantec
260 West Exchange Street, Suite 001
Providence, Rhode Island 02903

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079

File 17J33
November, 2017



LEGEND

0+00 — 27+70 SEISMIC LINE

130+00 — 136+89 MAIN LINE TUNNEL – ALTERNATIVE 5A ALIGNMENT PER STANTEC

SCALE (feet) 0 400 800

H-R N

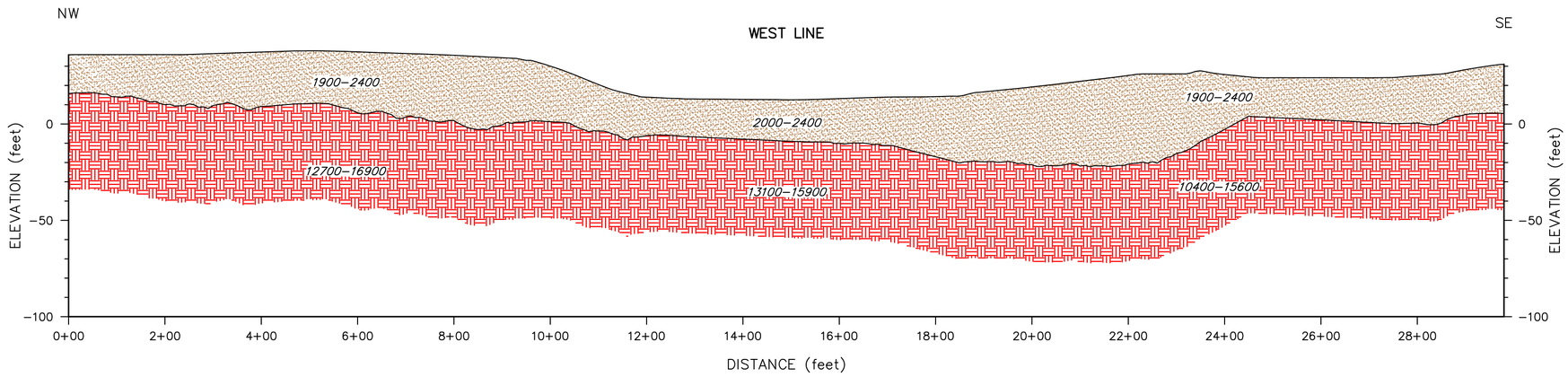
NOTE:

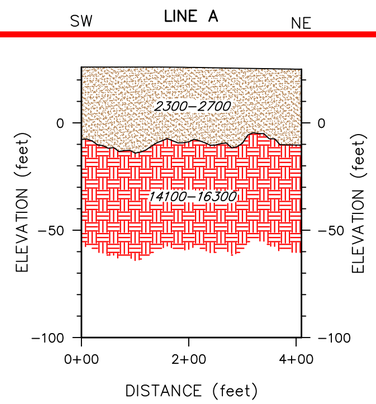
Modified from Google Earth Pro aerial photograph.

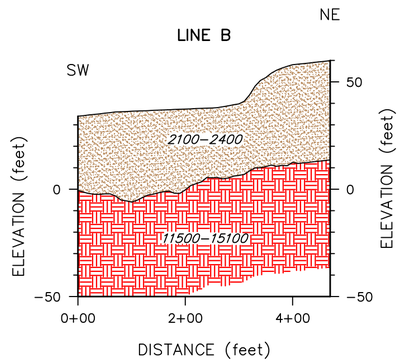
PLATE 1
SEISMIC LINE LOCATIONS
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW PROJECT
PAWTUCKET MAIN TUNNEL SECTION
PAWTUCKET, RHODE ISLAND

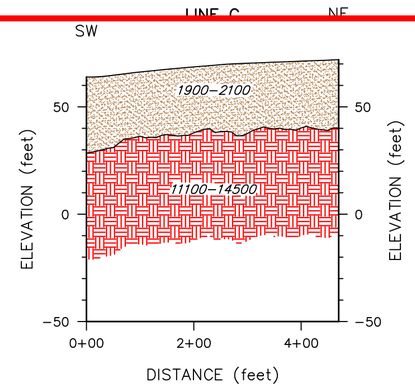
FILE 17J33 | NOVEMBER, 2017

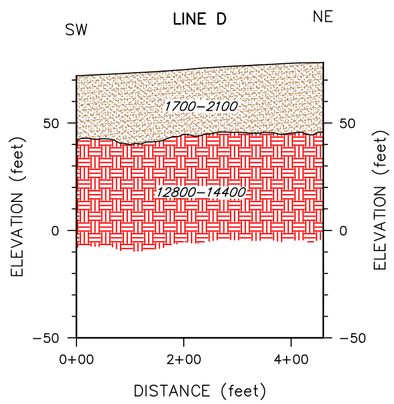
HAGER–RICHTER
SALEM, NH | FORDS, NJ

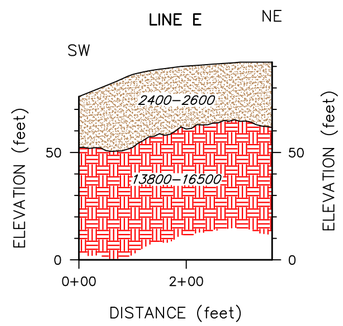


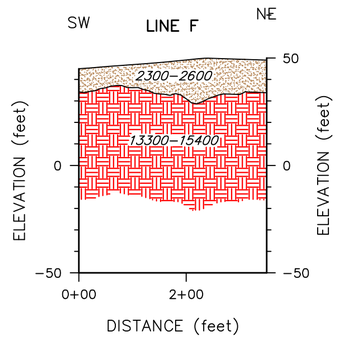












NOTES:

1. Estimated accuracy (standard deviation) of depth of bedrock is ±10% or 2 feet, whichever is greater.
2. The depths determined for bedrock are depths of competent rock; weathered and/or fractured bedrock might occur at shallower depths.
3. Surface elevations determined from plans provided by Stantec. Vertical datum is NGVD 1929.
4. Data were analyzed using the Generalized Reciprocal Method.

SCALE (feet)
0 100 200
Vertical Exaggeration = 4X

LEGEND

UNSATURATED / PARTIALLY SATURATED SOILS

COMPETENT BEDROCK

12200–14100 VELOCITY (fps)

INTERFACE DETERMINED FROM SEISMIC REFRACTION DATA

PLATE 3
SEISMIC PROFILES – WEST LINE & CROSS LINES
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW PROJECT
PAWTUCKET MAIN TUNNEL SECTION
PAWTUCKET, RHODE ISLAND

FILE 17J33 | NOVEMBER, 2017

HAGER–RICHTER
SALEM, NH | FORDS, NJ

Tidewater Site

Site Investigation Data Report
Former Tidewater MGP and Power Plant Site
Pawtucket, Rhode Island
RIDEM Case No. 95-022

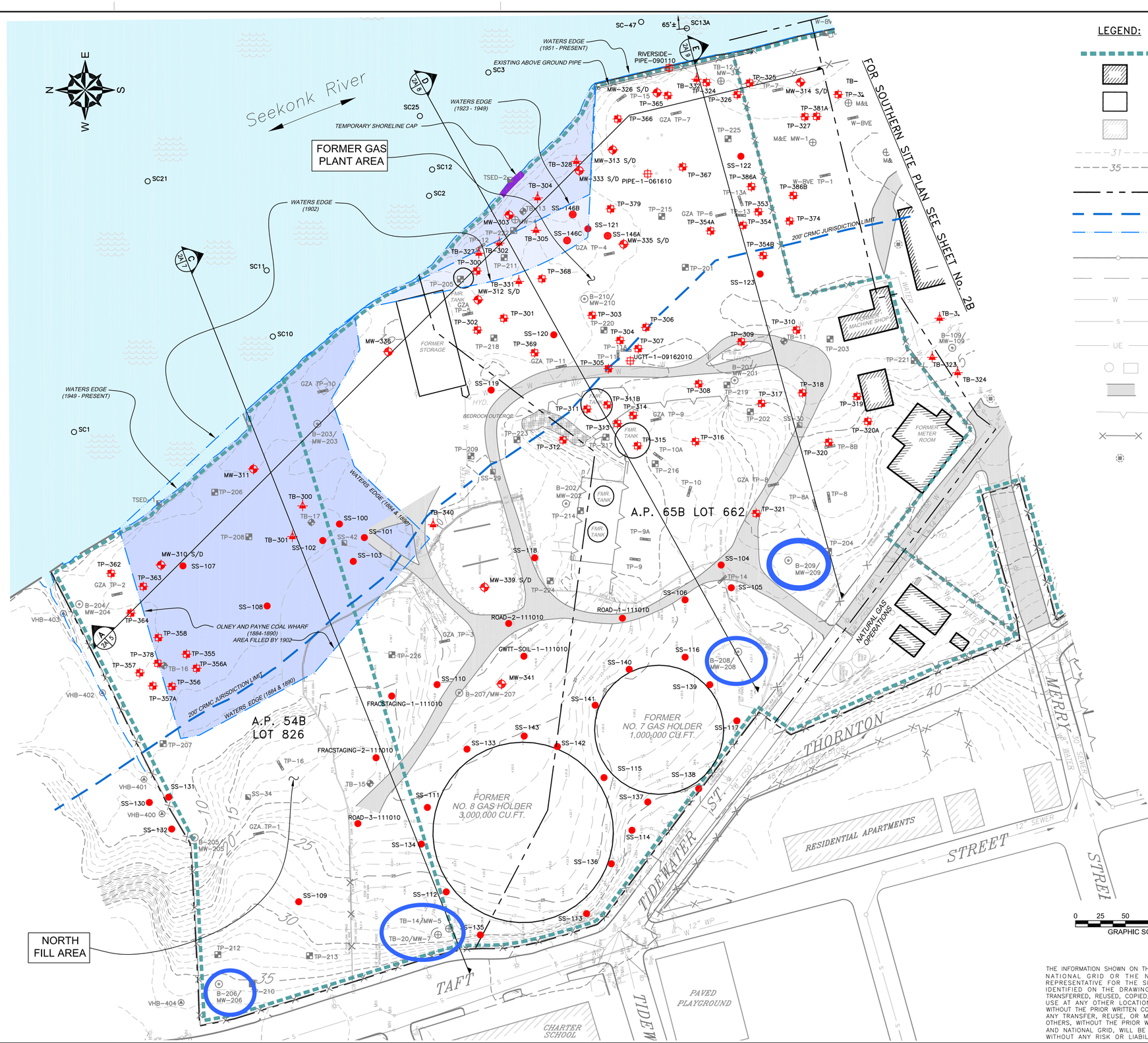
PREPARED FOR:
RIDEM, OWM
PROVIDENCE,
RHODE ISLAND

ON BEHALF OF:
nationalgrid
WALTHAM, MASSACHUSETTS

PREPARED BY:
GZA GEOENVIRONMENTAL, INC.
530 Broadway
Providence, Rhode Island
02909

DATE:
JANUARY 2011

GZA FILE NO.
05.0043654.00



LEGEND:

- SITE AREA BOUNDARIES
- EXISTING BUILDINGS ON-SITE
- EXISTING FOUNDATION/PAD ON-SITE
- EXISTING BUILDINGS/STRUCTURES OFF-SITE
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPERTY LINE
- APPROX. 200 FT. CRMC JURISDICTION LIMIT
- APPROX. WATERS EDGE
- EXISTING NBC INTERCEPTOR SANITARY SEWER
- EXISTING CITY OF PAWTUCKET STORM DRAIN
- EXISTING WATER LINE
- EXISTING STORM/COMBINED SAN. SEWER OVERFLOW
- EXISTING UNDERGROUND ELECTRIC CABLE IN CONDUIT
- EXISTING UNDERGROUND ELECTRIC MH/STRUCTURE
- EXISTING ACCESS ROAD
- EXISTING RETAINING WALLS
- EXISTING FENCE
- EXISTING CATCH BASIN LOCATIONS

SAMPLE LEGEND

SS-9	ATLANTIC SURFACE SOIL SAMPLE LOCATION
TSED-6	ATLANTIC SEDIMENT SAMPLE LOCATION
W-BVE SS-3	WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
RIDEM SS-3	RIDEM SURFACE SOIL SAMPLE LOCATION
B-109/ MW-109	MONITORING WELL/BORING (VHB) SURVEYED
TP-3A	ATLANTIC TEST PIT LOCATION
W-BVE	WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
GZA TP-8	GZA/VALLEY GAS TEST PIT LOCATION
TB-15	ATLANTIC SOIL BORING LOCATION
MW-3	ATLANTIC MONITORING WELL LOCATION
M&E MW-1	METCALF & EDDY MONITORING WELL LOCATION
VHB-400	VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
TP-204	VHB TEST PIT (2006)
GZ-01	GZA TEST PIT (2009)
TB-300	GZA TEST BORING LOCATION (2010)
MW-320 S/D	GZA MONITORING WELL LOCATION (2010)
TP-306	GZA TEST PIT LOCATION (2010)
SS-100	GZA SURFACE SOIL SAMPLE LOCATION (2010)
SC31	ARCADIS SEDIMENT SAMPLE LOCATION (2008)
PIPE-1-061610	GZA RESIDUAL MATERIAL SAMPLE (2010)

GENERAL NOTES:

1. EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
   - ELECTRONIC FILES FROM GEI CONSULTANTS, INC. (FORMERLY AES) ENTITLED "HISTORIC STRUCTURES AND SAMPLE LOCATIONS", ORIGINAL SCALE 1"=80', DATED JULY 1999
   - ELECTRONIC FILES FROM VANASSE HANGEN BRUSTLIN, INC. ENTITLED "SOIL BORING, TEST PIT AND MONITOR WELL LOCATIONS", SCALE: 1"=60', UNDATED
   - ELECTRONIC FILES FROM WELSH ASSOCIATES LAND SURVEYORS, INC. ENTITLED "TOPOGRAPHIC SURVEY (AS-BUILT), FORMER TIDEWATER FACILITY, DEMOLITION OF GAS HOLDERS NOS. 7 & 8", DATED DECEMBER 17, 2010
   - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS DURING 2009 AND 2010.
2. PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES AND AN AUTO CAD FILE ENTITLED "MAX READ FIELD TRACK EXPANSION 2007" PROVIDED BY THE CITY OF PAWTUCKET.
3. HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
4. VERTICAL DATUM IS BASED ON NGVD 1929 (MSL) FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
5. REFERENCE SEWER DATA FROM SCANNED IMAGE PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND, ENTITLED "STUDY OF SEWERAGE FACILITIES" BY WATERMAN ENGINEERING CO. & ANDERSON NICHOLS CO. DATED NOV. 1975, ORIGINAL SCALE 1"=400' & SCANNED IMAGES OF HISTORIC PLAN & PROFILE DRAWINGS PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND.
6. SITE UTILITIES TAKEN FROM 1984 SANBORN MAP AND HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NO.	ISSUE/DESCRIPTION	BY	DATE

FORMER TIDEWATER FACILITY

PAWTUCKET, RHODE ISLAND

EXPLORATION LOCATION PLAN
NORTH FILL AREA AND FORMER GAS PLANT AREA

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
530 BROADWAY
PROVIDENCE, RHODE ISLAND 02909
(401) 421-4140

PREPARED FOR: NATIONAL GRID

PROJ MGR: MSK	REVIEWED BY: WF	CHECKED BY: MSK	FIGURE 2A
DESIGNED BY: WF	DRAWN BY: CRD	SCALE: 1"=50"	
DATE JANUARY 2011	PROJECT NO. 43654.00	REVISION NO. 0	SHEET NO. 1 OF 24

©2010 - GZA GeoEnvironmental, Inc. GZA-J:\ENV\43654\map\CADD\GZA DWGS\SUPPLEMENTAL_SITE_INVESTIGATION_REPORT\43654-00_F2A-4B_RD_SSR-EXP-PLANS.dwg [2A] January 07, 2011 - 4:29pm deborah.landi

VHB Vanasse Hangen Brustlin, Inc.

Log of Well No. MW-206

GROUND SURFACE ELEVATION AND DATUM: 35.6 ft.			
PROJECT: Tidewater	DATE STARTED: 10-May-06	DATE FINISHED: 10-May-06	
DRILLING CONTRACTOR: Subsurface Drilling & Remediation	TOTAL DEPTH (ft.): 30	SCREEN INTERVAL (ft.): 20 - 30 Feet	
DRILLING METHOD: Hollow Stem Auger	DEPTH TO WATER: Approx. 24 feet	CASING: 2 inch Schedule 40 PVC	
SAMPLING METHOD: 2-Foot Split Spoon	LOGGED BY: CM		
HAMMER WEIGHT: 140 lbs.	DROP: 30 inches	Project No.: 71522	

DEPTH (feet)	Sample No.	Blows per 6 inches	PID Reading	DESCRIPTION: strata thickness,color, texture, moisture, observations
0				Ground Surface
1				Augered through Brick to 1 ft.
2		7/8/12/9	ND	0.2 ft. Dk Br vf/f sand, trace silt over 0.7 ft. Blk/Dk Gr vf sand, li ash, trace slag over 0.3 ft. Lt. olive Br vf sand
3				
4		12/12/9/10		0.5 ft. Lt Olive Br vf/f sand over 0.6 ft. Lt Olive Br vf sand, trace clay
5				
6		8/9/9/13		1.5 ft. Stratified Lt Olive Br silt and Lt Gray clay over 0.2 ft. Yellowish Br coarse sand
7				
8		12/12/12/12	ND	0.6 ft. Stratified Lt Olive Br silt and Lt Gray clay over 1.4 ft. of Yell Br coarse sand
9				
10		6/8/7/6		0.3 ft. Br Yell coarse sand, trace gravel over 0.9 ft. Lt Gr coarse sand, trace gravel
11				
12		10/11/11/12	ND	1.8 ft. Lt. Gr Coarse sand, trace gravel
13				
14		15/13/9/8		1.6 ft. Lt. gr Coarse sand, trace gravel
15				
16				
17				Augered to 20 feet
18				
19				
20				
21		15/11/13/12		1.2 ft. Lt Olive Br Coarse sand, li gravel
22				
23				Augered to 25 feet
24				
25				
26		6/11/10/9		1.1 ft. Olive br coarse sand and f/c gravel, wet
27				
28				Augered to 30 feet
29				
30				
31				
32				

WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS

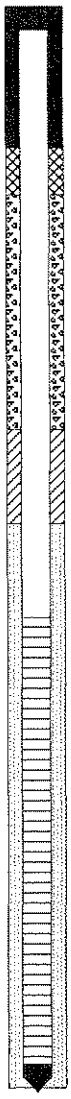
VHB Vanasse Hangen Brustlin, Inc.

Log of Well No. MW-208

GROUND SURFACE ELEVATION AND DATUM: 26.4 ft.			
PROJECT: Tidewater	DATE STARTED: 10-May-06	DATE FINISHED: 10-May-06	
DRILLING CONTRACTOR: Subsurface Drilling & Remediation	TOTAL DEPTH (ft.): 20	SCREEN INTERVAL (ft.): 10 - 20 Feet	
DRILLING METHOD: Hollow Stem Auger	DEPTH TO WATER: Approx. 14 feet	CASING: 2 inch Schedule 40 PVC	
SAMPLING METHOD: 2-Foot Split Spoon	LOGGED BY: CM		
HAMMER WEIGHT: 140 lbs.	DROP: 30 inches	Project No.: 71522	

DEPTH (feet)	Sample No.	Blows per 6 inches	PID Reading	DESCRIPTION: strata thickness,color, texture, moisture, observations
				Ground Surface
0–1	B-208 (0-2 ft.)	5/30/15/10		0.7 ft. Olive Br/Lt Olive Br vf/f sand, li Slag over 0.2 ft. rock/cement over 0.4 ft. Lt Olive Br/Blk vf sand and gravel
2–3		10/12/12/17		No Recovery
4–5	B-208 (4-6 ft.)	4/13/9/8		0.7 ft. Lt Olive Br vf/f sand, trace rock
6–7		4/5/5/5		0.7 ft. SAA
8–9		10/7/7/5	ND	0.6 Ft. SAA
10–11		2/4/8/15		0.8 ft. Olive Br vf/f sand and m/c gravel
12–13		22/22/25/27	ND	0.6 ft. SAA over 0.7 ft. Yell Br c sand, tr/li f/m gravel
14–15		22/25/22/60	ND	0.6 ft. Olive Br vf/c sand and gravel (pieces of quartz-like rock), dense, wet, till-like
16–17				
18–19				Augered to 20 ft.
20–21				
22–23				
24–25				
26–27				

WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS



Stand Pipe

2 inch diameter Schedule 40 PVC Riser Pipe

Cement

Backfill

Bentonite Chip Seal

Silica Sand

2 inch diameter 0.010 inch slot, Sch.40PVC screen

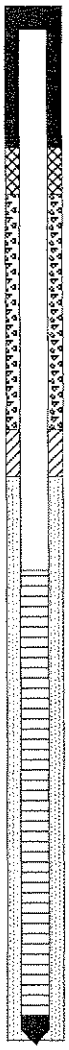
2 inch Schedule 40 PVC end cap

VHB Vanasse Hangen Brustlin, Inc.

Log of Well No. MW-209

GROUND SURFACE ELEVATION AND DATUM: 22.7 ft.			
PROJECT: Tidewater	DATE STARTED: 10-May-06	DATE FINISHED: 10-May-06	
DRILLING CONTRACTOR: Subsurface Drilling & Remediation	TOTAL DEPTH (ft.): 19	SCREEN INTERVAL (ft.): 9-19 ft.	
DRILLING METHOD: Hollow Stem Auger	DEPTH TO WATER: Approx. 14 ft.	CASING: 2 inch Schedule 40 PVC	
SAMPLING METHOD: 2-Foot Split Spoon	LOGGED BY: CM		
HAMMER WEIGHT: 140 lbs. DROP: 30 inches	Project No.: 71522		

DEPTH (feet)	Sample No.	Blows per 6 inches	PID Reading	DESCRIPTION: strata thickness,color, texture, moisture, observations
				Ground Surface
0–1	B-209 (15-17 ft.)	20/35/28/20	ND	0.2 ft. Lt Olive Br m/c sand over 1 ft. Blk/V Dk Gr vf/f sand/coal dust, trace f/m gravel
1–6				Augered to 5 ft.
6–7		7/8/10/12	ND	1.6 ft. Lt Olive Br f/m sand, trace f gravel
7–11				Augered to 10 ft.
11–12		5/11/10/9	ND	1.4 ft. Olive Br/Lt Olive Br vf/m sand, trace f gravel, moist
12–16				Augered to 15 ft.
16–17		35/40/30/48	3	1.1 ft. Dk Gr vf/c sand, trace silt and c gravel, till-like, dense, wet
17–19				Attempted to auger to 20 ft., encountered refusal at 19 ft.



WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS

- Stand Pipe
- 2 inch diameter Schedule 40 PVC Riser Pipe
- Cement Grout
- Backfill
- Bentonite Chip Seal
- Silica Sand
- 2 inch diameter 0.010 inch slot, Sch.40PVC screen
- 2 inch Schedule 40 PVC end cap

MW-7/TB-20

Atlantic Environmental Services, Inc.

Ground Elevation: 29.24'	X Coordinate: 359651.14
Water Table Elevation: 10.34'	Y Coordinate: 286416.37

Project Number: 2061-03-05
Project Name: Tidewater
Location: Pawtucket, RI
Date Started: 08/14/96
Date Completed: 08/14/96
Drilling Contractor: B.L. Myers Bros., Inc.
Drilling Method: Hollow Stem Auger
Certified By: P.Georgetti
Remarks:

Datum: V: NGVD 1929 (MSL) H: NAD 1983
Top of PVC Elevation: 32.10'

Conductor Casing:
type: dia: 0.00in fm: 0.00' to: 0.00'

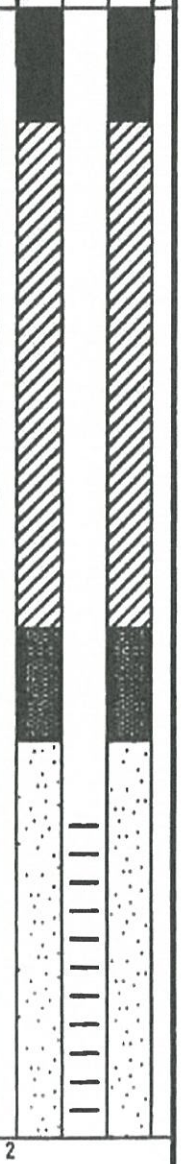
Blank Casing:
type: PVC dia: 2.00in fm: -2.1' to: 14.50'

Screens:
type: Slotted size: 0.010in dia: 2.00in fm: 14.50' to: 24.50'

Annular Fill:
type: Concrete fm: 0.00' to: 2.00'
type: Cement Bentonite Grout fm: 2.00' to: 11.00'
type: Bentonite fm: 11.00' to: 13.00'
type: Sand Filter fm: 13.00' to: 25.00'

Sample No.	Blow Count (6")	Recovery %	PID	Elevation (ft)	Material Description	Odor	Visual	Lithology	Depth (ft)
					Augered to 15 feet				
15-17	5 13 27 21	50	0 ppm		Tan/brown, and orange fine to med. Sand, some large cobbles (native), dry	None	None		15
17-19	17 18 17 15	75	0 ppm		Tan/brown fine to coarse Sand, trace Cobbles	None	None		17
19-21	90 39 40	75	0 ppm	10	Orange/tan Silt with large cobbles and weathered bedrock/till, saturated, roots	None	None		19

Well Construction



MW-7/TB-20

Atlantic Environmental Services, Inc.

Ground Elevation: 29.24'	X Coordinate: 359651.14
Water Table Elevation: 10.34'	Y Coordinate: 286416.37

Project Number: 2061-03-05

V: NGVD 1929 (MSL) H: NAD 1983

Project Name: Tidewater

Top of PVC Elevation: 32.10'

Location: Pawtucket, RI

Conductor Casing:
type: dia: 0.00in fm: 0.00' to: 0.00'

Date Started: 08/14/96

Blank Casing:
type: PVC dia: 2.00in fm: -2.1' to: 14.50'

Date Completed: 08/14/96

Drilling Contractor: E.L. Widness Bros., Inc.

Screens:
type: Slotted size: 0.010in dia: 2.00in fm: 14.50' to: 24.50'

Drilling Method: Hollow Stem Auger

Certified By: P.Georgetti

Annular Fill:
type: Concrete fm: 0.00' to: 2.00'
type: Cement Bentonite Grout fm: 2.00' to: 11.00'
type: Bentonite fm: 11.00' to: 13.00'
type: Sand Filter fm: 13.00' to: 25.00'

Remarks:

Sample No.	Blow Count (6")	Recovery %	PID	Elevation (ft)	Material Description	Odor	Visual	Lithology	Depth (ft)	Well Construction
	41									
21-23	32 46 50 52	50	0 ppm		Gray fine Sand, Silt, shale, and Cobbles, moist to saturated, very tight (weathered bedrock/till)	None	None		21 22	
23-25	35 30 24 64	75	0 ppm		Gray/tan Silt and gray shale with medium to coarse Sand; very tight (weathered bedrock/till)	None	None		23 24 25	
				0					26 27 28 29	
									30 31 32 33	
									34 35 36 37	
				-10					38 39	

MW-5/TB-14

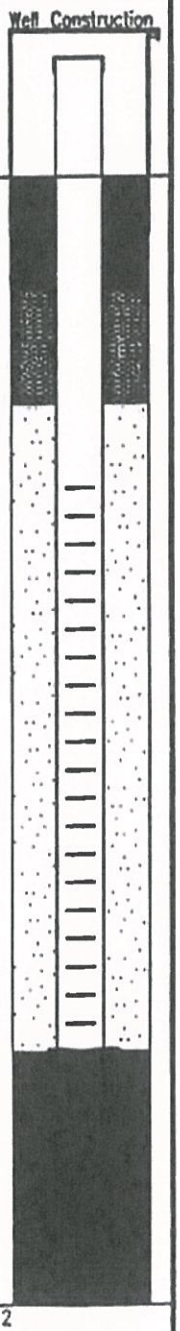
Atlantic Environmental Services, Inc.	
Ground Elevation: 29.37'	X Coordinate: 359657.17
Water Table Elevation:	Y Coordinate: 286405.42
Datum: V: NGVD 1929 (MSL) H: NAD 1983	
Top of PVC Elevation: 32.00'	
Conductor Casing: type: dia: 0.00in fm: 0.00' to: 0.00'	
Blank Casing: type: PVC dia: 2.00in fm: -2.1' to: 5.50'	
Screens: type: Slotted size: 0.010in dia: 2.00in fm: 5.50' to: 15.50'	
Annular Fill: type: Concrete fm: 0.00' to: 2.00'; type: Bentonite fm: 2.00' to: 4.00'; type: Sand Filter fm: 4.00' to: 15.50'; type: Cement Bentonite Grout fm: 15.50' to: 25.00'	

Project Number: 2061-03-05
Project Name: Tidewater
Location: Pawtucket, RI
Date Started: 07/09/96
Date Completed: 07/09/96
Drilling Contractor: B.L. Myers Bros., Inc.
Drilling Method: Hollow Stem Auger
Certified By: P.Georgetti

Remarks: Boring TB-14 was grouted to the surface, MW-5 was installed to a depth of 15.5 feet as shown, adjacent to TB-14.

Sample No.	Blow Count (6")	Recovery %	PID	Elevation (ft)	Material Description	Odor	Visual	Lithology	Depth (ft)
-2	6 6 14 14	60	ppm		Topsoil	None	None		
					Gray fine Sand and Silt, some Clay, fine layering varves				1
-4	12 11 17 15	70			Same, perched water (Sampled 0-2)	None	None		2, 3
-6	12 15 15 17	85			Orange fine Sand, some dark orange/black Silt; 0.2' manganese rich layer at bottom	None	None		4
					Light brown fine Sand, some Silt, moist				5
-8	NR NR NR NR	85			Same, wet Dark gray Silt and Clay, wet (Sampled 4-6)	None	None		6, 7
8-10	6 4 4 8	100		20	Gray v. fine Sand and Silt, some Clay, layering, slight red/pink coloring throughout; wet	None	None		8, 9
10-12	4 3 3 7	90			Gray Silt, some Clay, wet	None	None		10, 11
12-14	3 3 3 3	90			Same, some light red/brown Silt layers	None	None		12, 13
14-16	4 6 6 7	95			Gray very fine Sand and Silt, wet	None	None		14, 15
-18	11 12 14 14	90			Orange very fine Sand and Silt	None	None		16
					Brown/pink medium Sand, some Gravel, trace Silt, wet				17
-20	8 12 15 20	50		10	Red brown fine to medium Sand, some Gravel, wet	None	None		18, 19

Well Construction



MW-5/TB-14

Atlantic Environmental Services, Inc.

Ground Elevation: 29.37'	X Coordinate: 359657.17
Water Table Elevation:	Y Coordinate: 286405.42

Project Number: 2061-03-05
Project Name: Tidewater
Location: Pawtucket, RI
Date Started: 07/09/96
Date Completed: 07/09/96
Drilling Contractor: B.L. Myers Bros., Inc.
Drilling Method: Hollow Stem Auger
Certified By: P.Georgetti
Remarks:

V: NGVD 1929 (MSL) H: NAD 1983
Top of PVC Elevation: 32.00'

Conductor Casing:
type: dia: 0.00in fm: 0.00' to: 0.00'

Blank Casing:
type: PVC dia: 2.00in fm: -2.1' to: 5.50'

Screens:
type: Slotted size: 0.010in dia: 2.00in fm: 5.50' to: 15.50'

Annular Fill:
type: Concrete fm: 0.00' to: 2.00'
type: Bentonite fm: 2.00' to: 4.00'
type: Sand Filter fm: 4.00' to: 15.50'
type: Cement Bentonite Grout fm: 15.50' to: 25.00'

Sample No.	Blow Count (6")	Recovery %	PID	Elevation (ft)	Material Description	Odor	Visual	Lithology	Depth (ft)	Well Construction
0-22	22 22 32 30	50			Light brown Sand, Silt and Gravel, (fill), wet	None	None		21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39	
				0						
				-10						

Taft St. – Pleasant St. Branch Interceptor

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION

PROVIDENCE, RHODE ISLAND

TAFT ST.-PLEASANT ST. BRANCH INTERCEPTER SECTION B

INLET CHAMBER DETAILS FOUND IN THIS CONTRACT..."18"

CONTRACT DRAWINGS

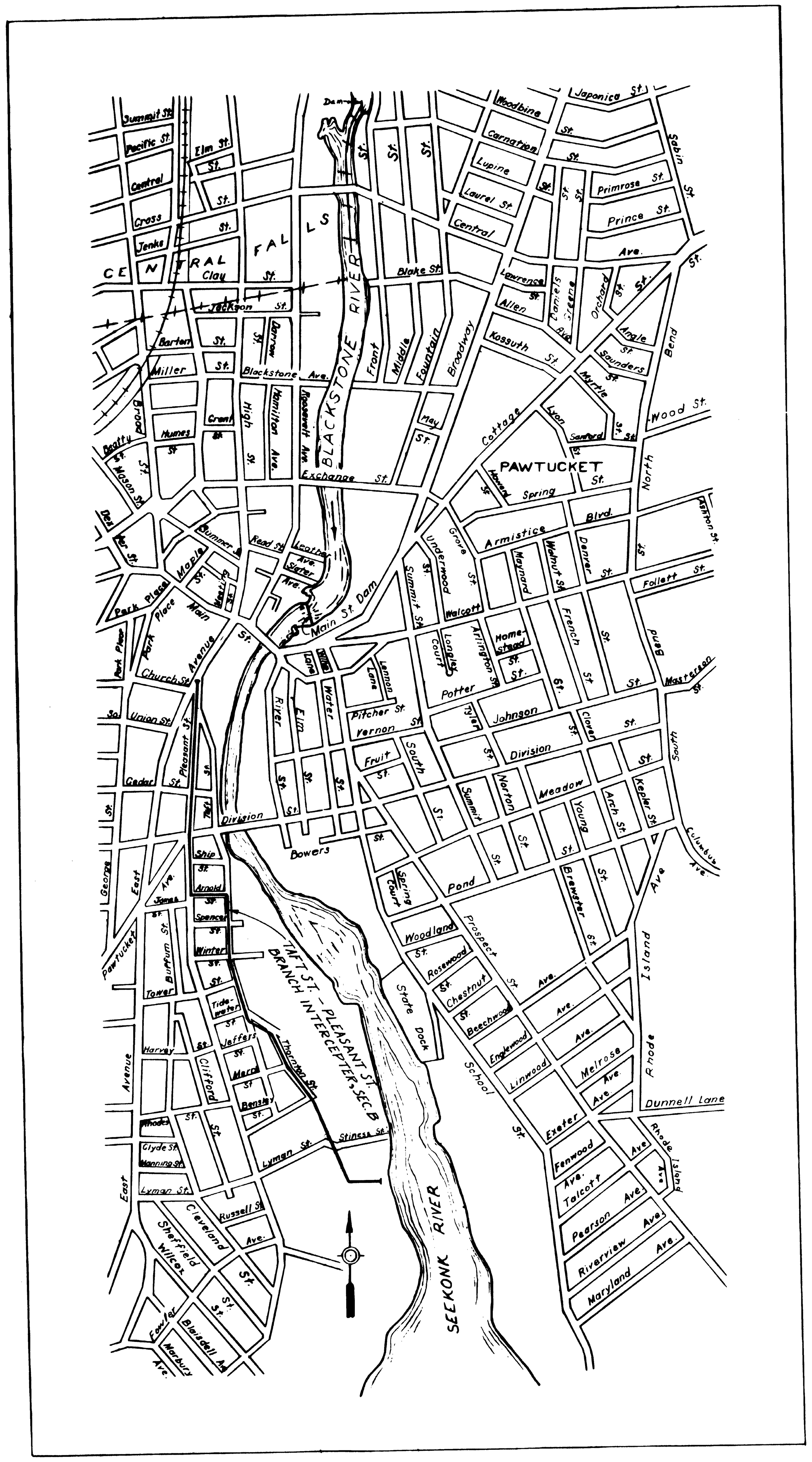
CONTRACT 18

1950

HONORABLE JOHN O. PASTORE, GOVERNOR

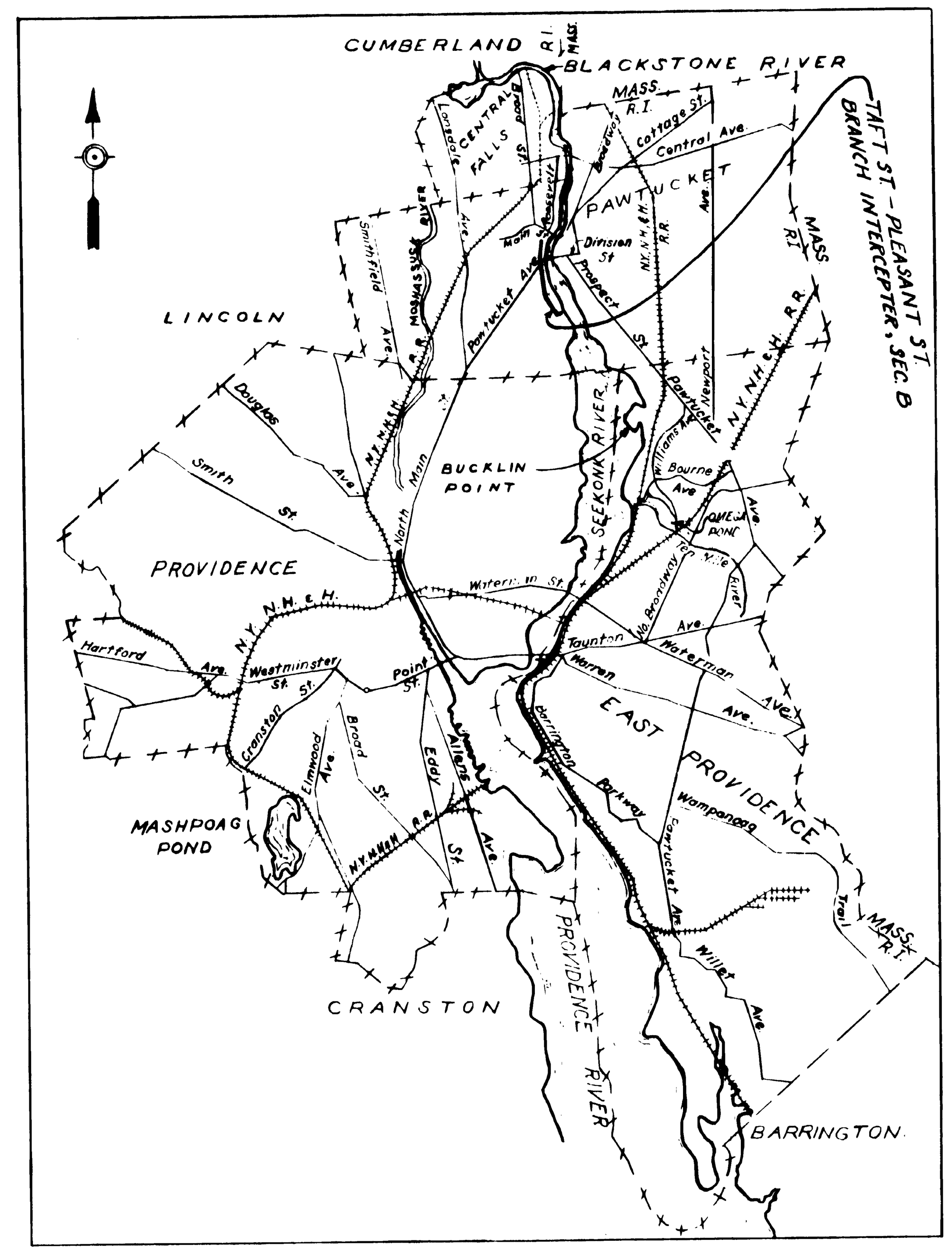
WILLIAM J. HALLORAN	CHAIRMAN
LUIGI SCALA	FIRST VICE CHAIRMAN
HAROLD J. CREEDON	SECOND VICE CHAIRMAN
PHILIP S. MANCINI	EX - OFFICIO
EDWARD A. McLAUGHLIN, M.D.	EX - OFFICIO
ANGELO A. BONVICIN	EXECUTIVE SECRETARY
CHARLES G. HAMMANN	CHIEF ENGINEER

METCALF & EDDY
ENGINEERS
BOSTON, MASS.



VICINITY PLAN

SCALE: 1" = 600'



LOCATION MAP

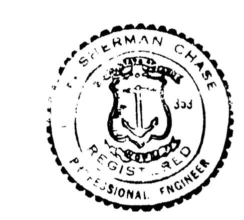
SCALE: 1" = 6000'

LIST OF DRAWINGS

SHEET NO.	TITLE
1	VICINITY PLAN AND LOCATION MAP - LIST OF DRAWINGS
2	PLAN AND PROFILE - STA. 7+00± TO STA. 12+00
3	" " " STA. 12+00 TO STA. 24+00
4	" " " STA. 24+00 TO STA. 36+00
5	" " " STA. 36+00 TO STA. 48+00
6	" " " STA. 48+00 TO STA. 54+37.74
7	BYPASS CONDUIT
8	SEWER AND TRENCH SECTIONS - UNDERDRAIN DETAILS
9	MANHOLE DETAILS
10	MISCELLANEOUS DETAILS
11	SIPHON INLET STRUCTURE - PART I OF V
12	" " " PART II OF V
13	" " " PART III OF V
14	" " " PART IV OF V
15	" " " PART V OF V
16	JUNCTION CHAMBER AT LYMAN ST. - PART I OF II
17	" " " " " PART II OF II
18	MERRY ST. SEWER CONNECTION - PART I OF II
19	" " " " PART II OF II

SHEET NO.	TITLE
20	TIDEWATER ST. SEWER CONNECTION - PART I OF II
21	" " " " PART II OF II
22	PLEASANT ST. SEWER CONNECTION - PART I OF II
23	" " " " PART II OF II
24	EAST AVENUE SEWER CONNECTION - PART I OF II
25	" " " " PART II OF II
26	JUNCTION CHAMBER AT PLEASANT ST.

DRAWN BY C.K.W.
TRACED BY W.S. - D.W.S.
CHECKED BY D.M.R.



APPROVED

FOR METCALF & EDDY, ENGINEERS

R.I. REG. PROF. ENGR. NO. 353 DATE

RECORD PLAN

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION
PROVIDENCE, RHODE ISLAND

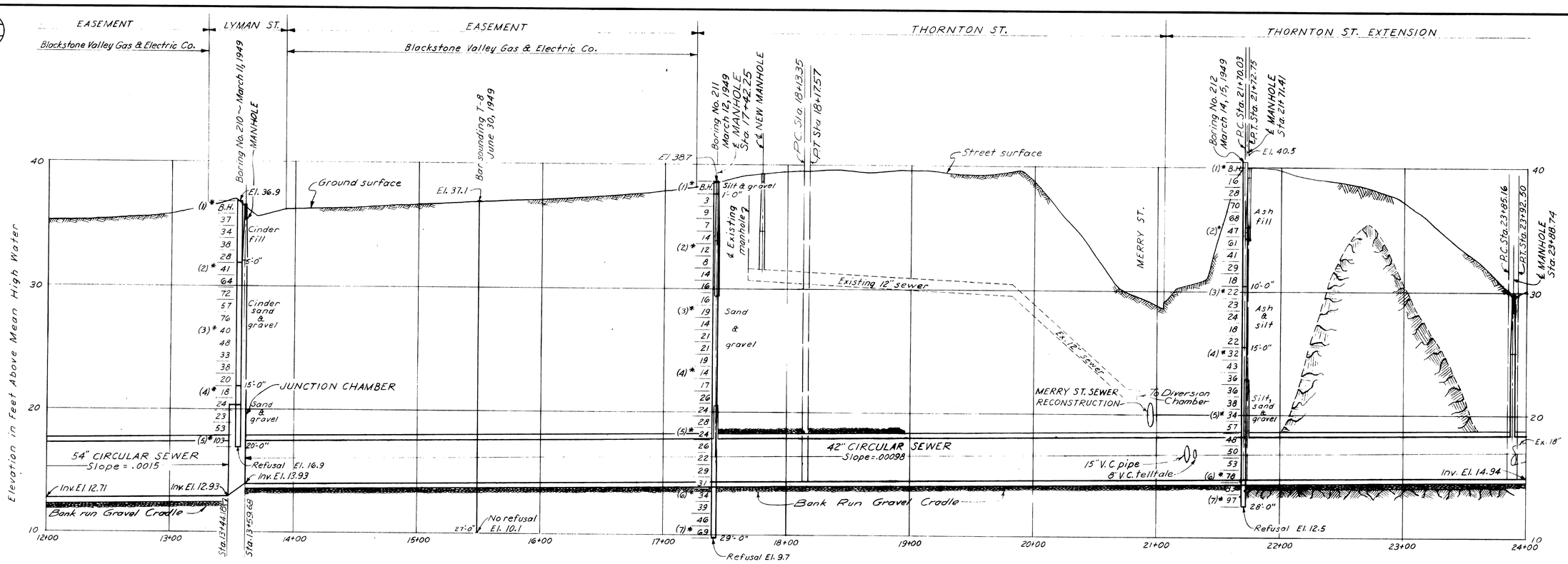
TAFT ST.-PLEASANT ST.
BRANCH INTERCEPTER
SECTION B

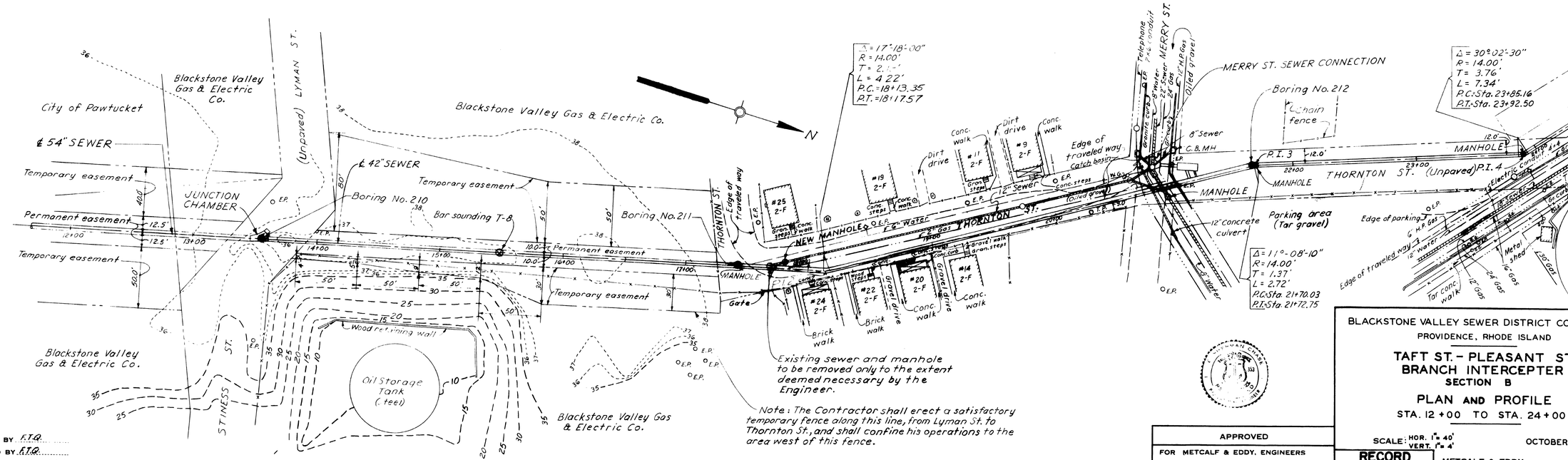
VICINITY PLAN AND LOCATION MAP
LIST OF DRAWINGS

SCALE: AS SHOWN OCTOBER 1950

METCALF & EDDY
ENGINEERS
BOSTON, MASS.

23912
H
11182





DRAWN BY F.T.Q.
TRACED BY F.T.Q.
CHECKED BY E.C.T., C.E.J.

APPROVED
FOR METCALF & EDDY, ENGINEERS
R.L. REG. PROF. ENGR. NO. 353 — DATE 10-22-50

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION
PROVIDENCE, RHODE ISLAND

TAFT ST. – PLEASANT ST. BRANCH INTERCEPTER

SECTION B

PLAN AND PROFILE

STA. 12+00 TO STA. 24+00

SCALE: HOR. 1" = 40' VERT. 1" = 4'

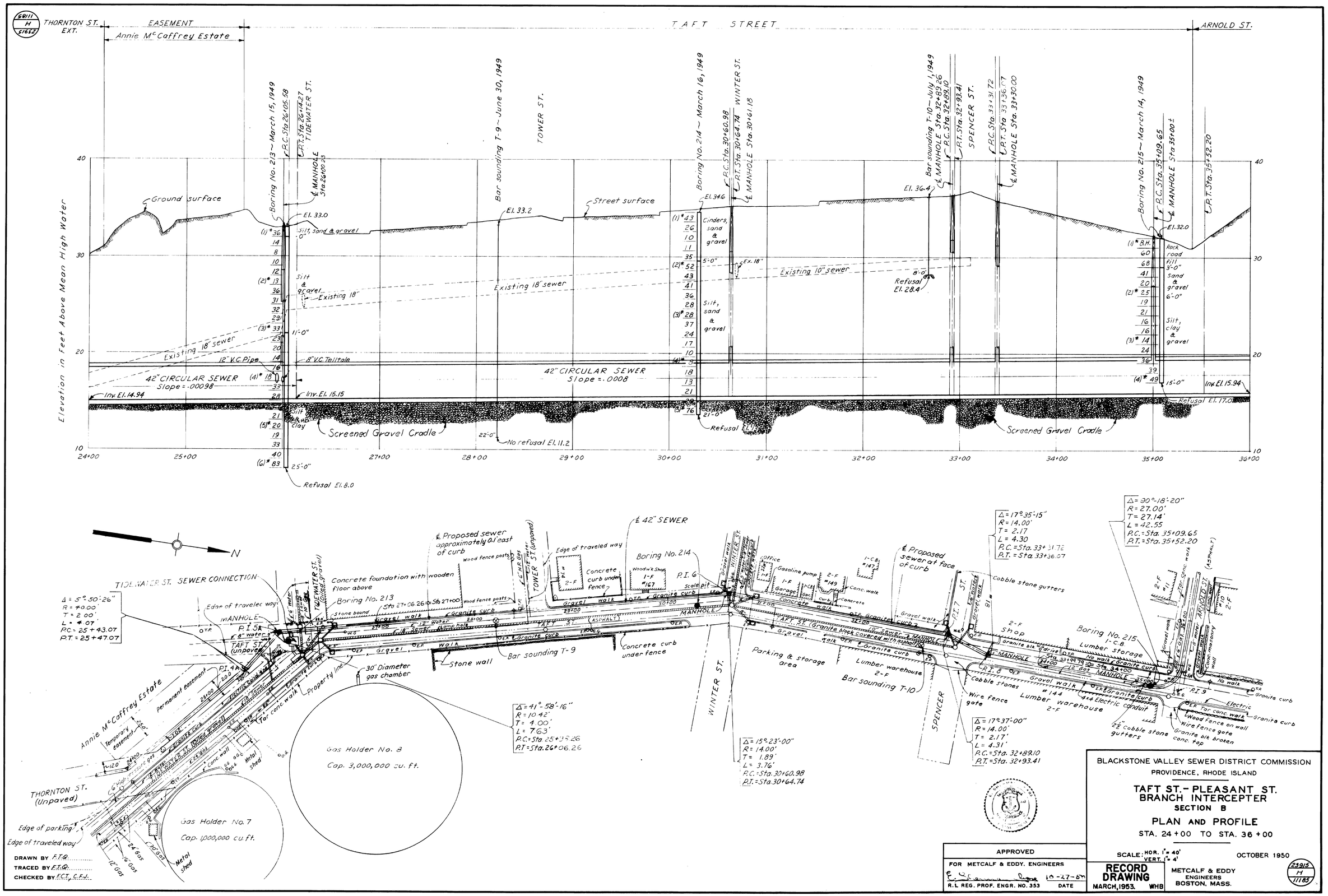
OCTOBER 1950

RECORD DRAWING
MARCH, 1953. E.K.

METCALF & EDDY
ENGINEERS
BOSTON, MASS.

23914
H
11184

CONTRACT 18 SHEET 3 OF 24



DRAWN BY F.T.Q.
TRACED BY F.T.Q.
CHECKED BY F.C.T., C.F.J.

APPROVED
FOR METCALF & EDDY, ENGINEERS
R. L. REG. PROF. ENGR. NO. 353 — DATE 10-27-57

BLACKSTONE VALLEY SEWER DISTRICT COMMISSION
PROVIDENCE, RHODE ISLAND

TAFT ST.- PLEASANT ST. BRANCH INTERCEPTER
SECTION B
PLAN AND PROFILE
STA. 24 + 00 TO STA. 36 + 00

SCALE: HOR. 1" = 40' VERT. 1" = 4'
OCTOBER 1950

RECORD DRAWING
MARCH, 1953. WHB

METCALF & EDDY
ENGINEERS
BOSTON, MASS.

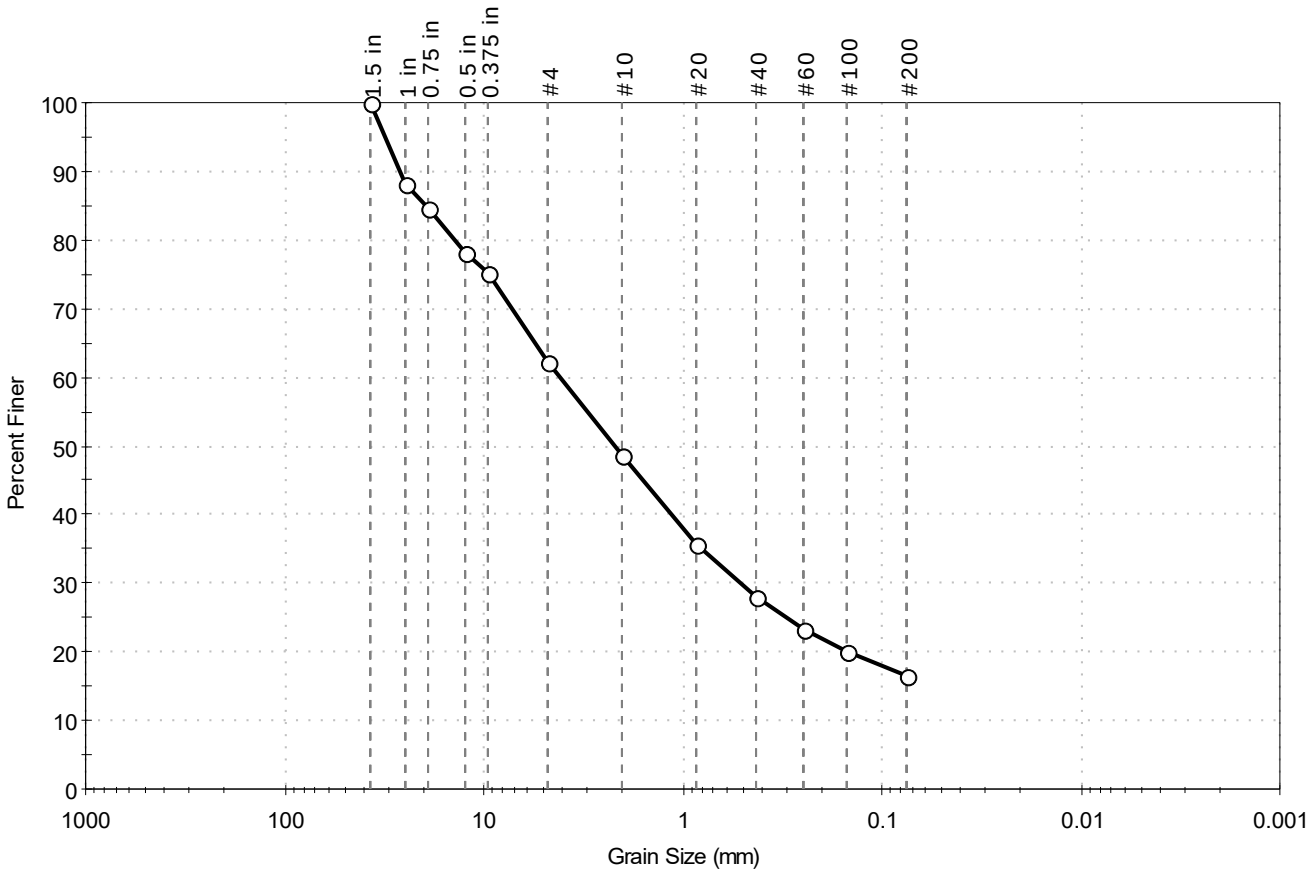
23915 H 11185

CONTRACT 18 SHEET 4 OF 26

APPENDIX E
Geotechnical Laboratory Testing Results

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-1	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-1	Test Date:	10/01/19	Checked By:	bfs
Depth :	6-8 ft	Test Id:	525243		
Test Comment:	---				
Visual Description:	Moist, brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	37.6	45.8	16.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	88		
0.75 in	19.00	85		
0.5 in	12.50	78		
0.375 in	9.50	75		
#4	4.75	62		
#10	2.00	49		
#20	0.85	36		
#40	0.42	28		
#60	0.25	23		
#100	0.15	20		
#200	0.075	17		

Coefficients

D_{85} = 19.3520 mm D_{30} = 0.5113 mm
D_{60} = 4.1040 mm D_{15} = N/A
D_{50} = 2.1878 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

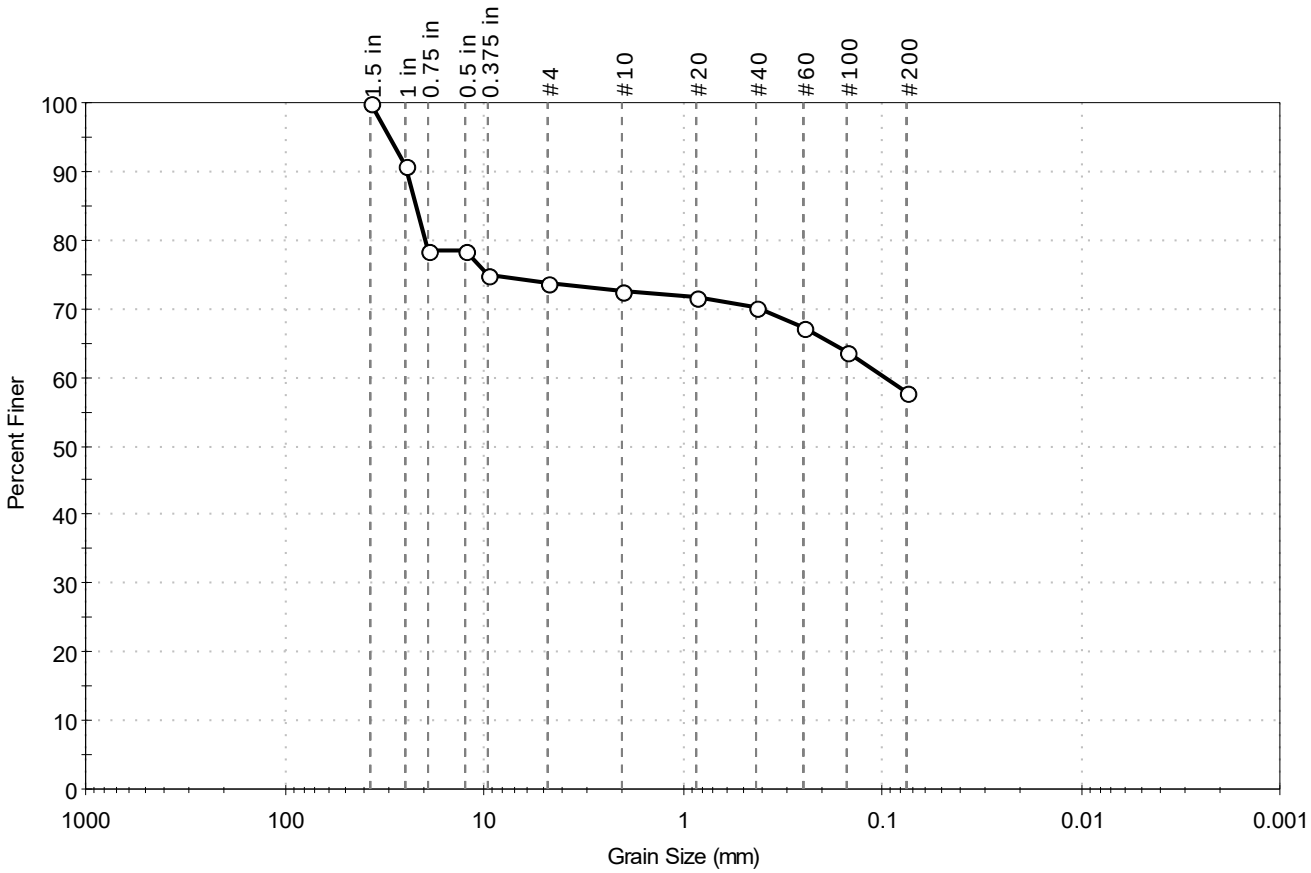
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:53 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-2	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-3	Test Date:	10/01/19	Checked By:	bfs
Depth :	10-12 ft	Test Id:	525244		
Test Comment:	---				
Visual Description:	Moist, brown silt with sand and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	26.3	15.8	57.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	91		
0.75 in	19.00	78		
0.5 in	12.50	78		
0.375 in	9.50	75		
#4	4.75	74		
#10	2.00	73		
#20	0.85	72		
#40	0.42	70		
#60	0.25	67		
#100	0.15	64		
#200	0.075	58		

Coefficients

D_{85} = 21.9919 mm D_{30} = N/A
D_{60} = 0.0969 mm D_{15} = N/A
D_{50} = N/A 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

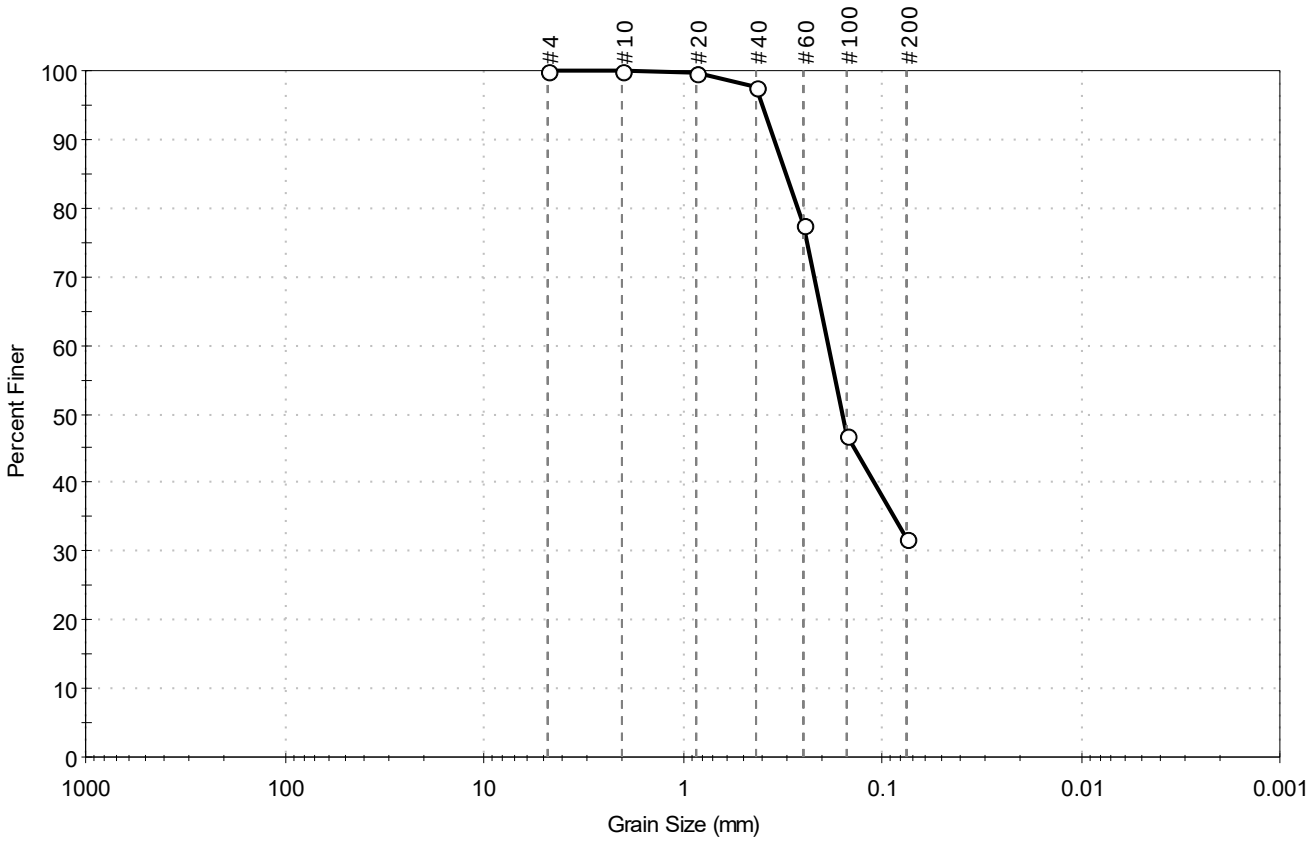
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:54 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-2	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-7	Test Date:	10/01/19	Checked By:	bfs
Depth :	18-20 ft	Test Id:	525245		
Test Comment:	---				
Visual Description:	Moist, brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	68.1	31.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	78		
#100	0.15	47		
#200	0.075	32		

Coefficients

D_{85} = 0.3049 mm D_{30} = N/A

D_{60} = 0.1866 mm D_{15} = N/A

D_{50} = 0.1579 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

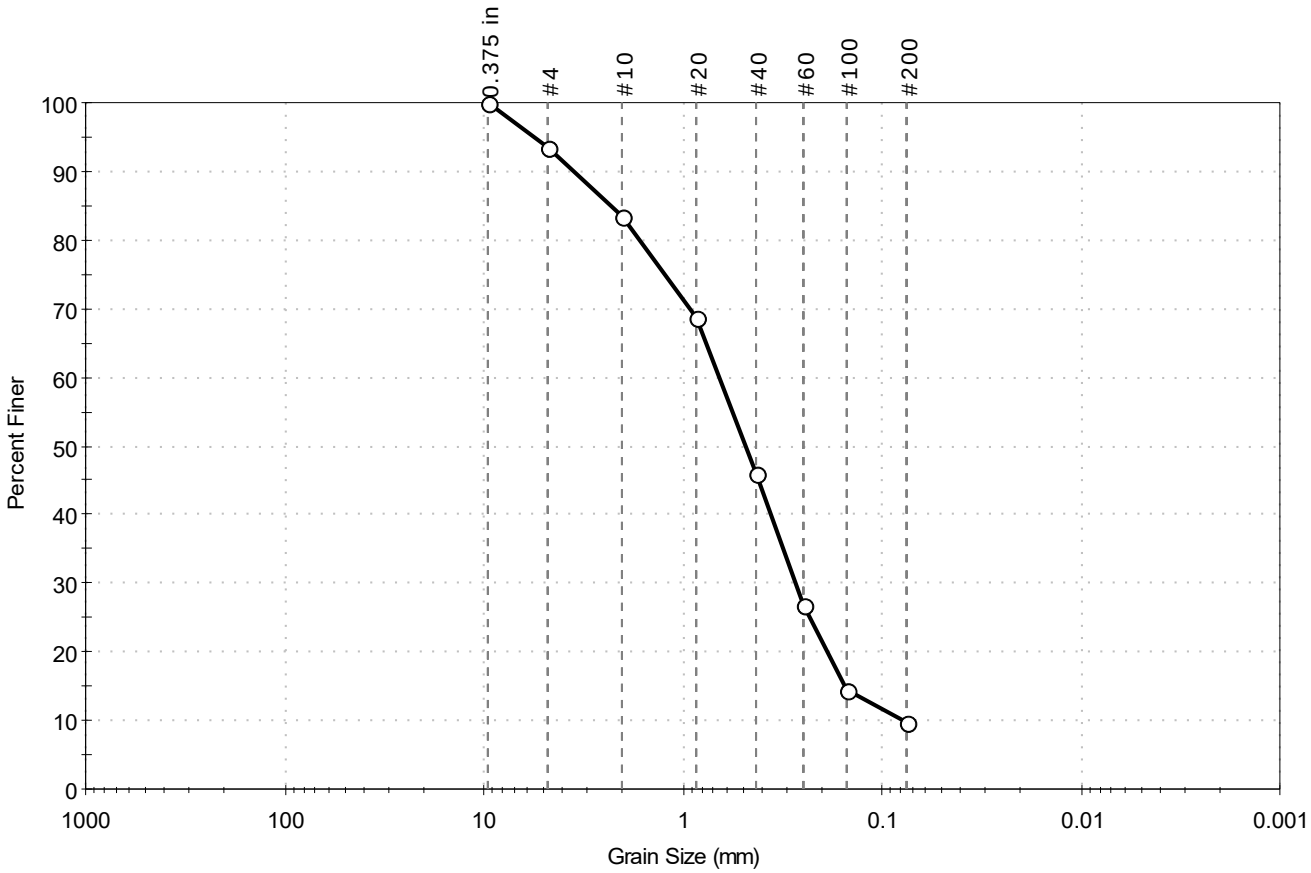
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

printed 10/3/2019 3:49:55 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-3	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-2	Test Date:	10/01/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	525246		
Test Comment:	---				
Visual Description:	Moist, brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	6.5	83.8	9.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	93		
#10	2.00	83		
#20	0.85	69		
#40	0.42	46		
#60	0.25	27		
#100	0.15	15		
#200	0.075	9.7		

Coefficients

D_{85} = 2.2983 mm D_{30} = 0.2729 mm
D_{60} = 0.6501 mm D_{15} = 0.1526 mm
D_{50} = 0.4784 mm D_{10} = 0.0786 mm
C_u = 8.271 C_c = 1.457

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample / Test Description

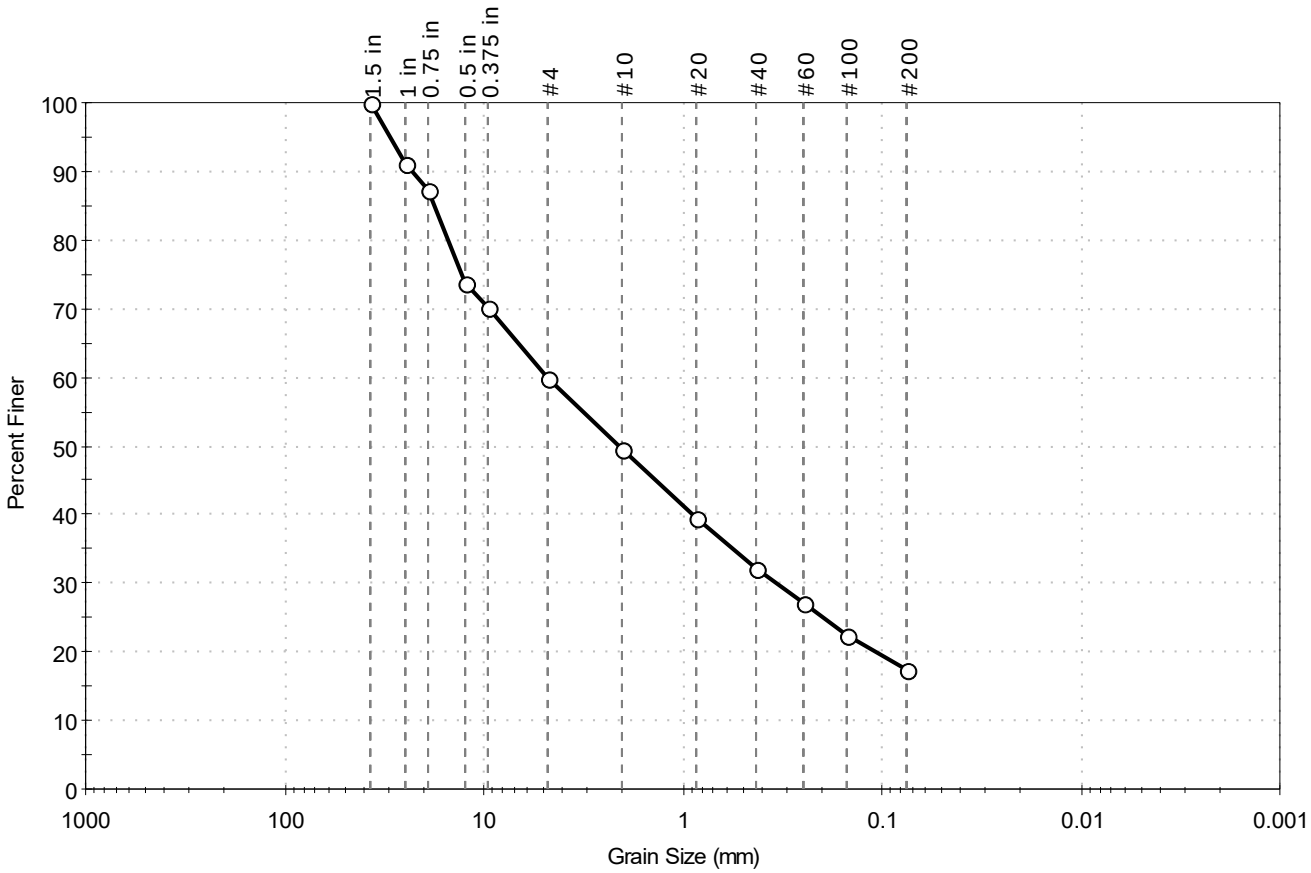
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:55 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-3	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-5	Test Date:	10/01/19	Checked By:	bfs
Depth :	25-27 ft	Test Id:	525247		
Test Comment:	---				
Visual Description:	Moist, brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	40.1	42.6	17.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	91		
0.75 in	19.00	87		
0.5 in	12.50	74		
0.375 in	9.50	70		
#4	4.75	60		
#10	2.00	50		
#20	0.85	39		
#40	0.42	32		
#60	0.25	27		
#100	0.15	22		
#200	0.075	17		

Coefficients

D_{85} = 17.7034 mm D_{30} = 0.3397 mm

D_{60} = 4.7666 mm D_{15} = N/A

D_{50} = 2.0608 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

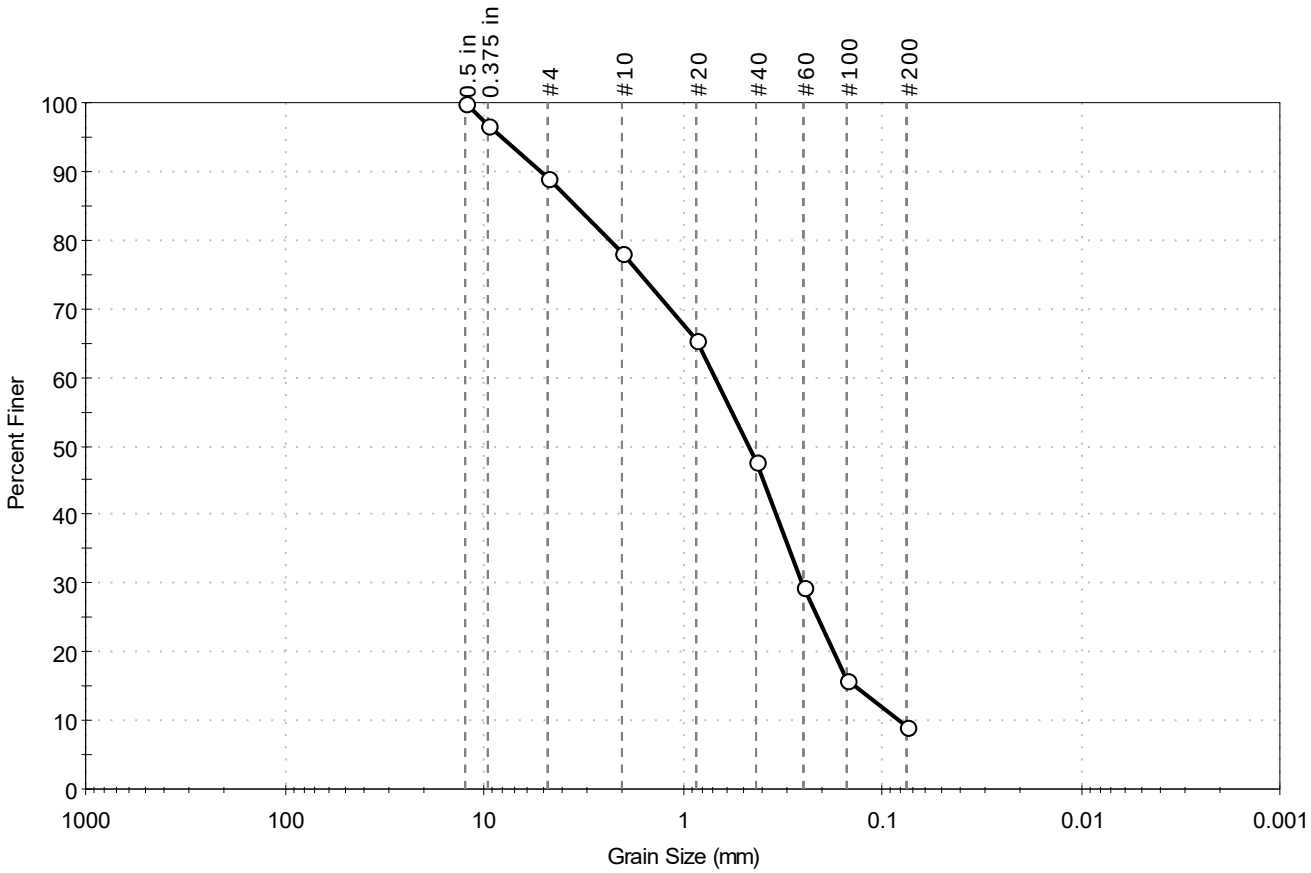
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:56 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-4C	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-2	Test Date:	10/01/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	525248		
Test Comment:	---				
Visual Description:	Moist, yellowish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	11.0	79.8	9.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	97		
#4	4.75	89		
#10	2.00	78		
#20	0.85	66		
#40	0.42	48		
#60	0.25	30		
#100	0.15	16		
#200	0.075	9.2		

Coefficients

D_{85} = 3.4518 mm D_{30} = 0.2535 mm

D_{60} = 0.6837 mm D_{15} = 0.1355 mm

D_{50} = 0.4631 mm D_{10} = 0.0811 mm

C_u = 8.430 C_c = 1.159

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

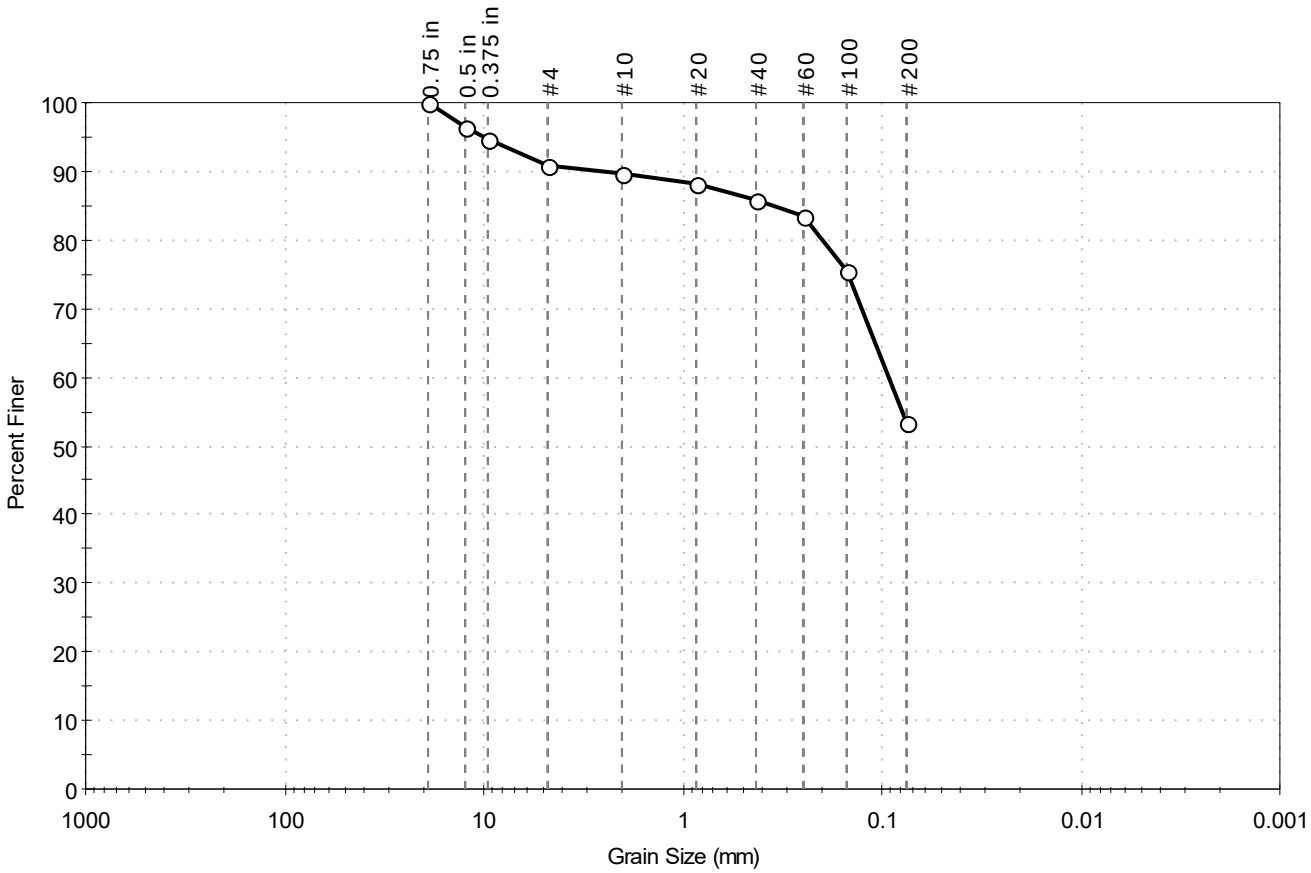
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:57 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-4C	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-3b	Test Date:	10/01/19	Checked By:	bfs
Depth :	19-21 ft	Test Id:	525249		
Test Comment:	---				
Visual Description:	Moist, dark yellowish brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	9.1	37.4	53.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	96		
0.375 in	9.50	95		
#4	4.75	91		
#10	2.00	90		
#20	0.85	88		
#40	0.42	86		
#60	0.25	84		
#100	0.15	75		
#200	0.075	54		

Coefficients

D_{85} = 0.3439 mm D_{30} = N/A

D_{60} = 0.0921 mm D_{15} = N/A

D_{50} = N/A 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

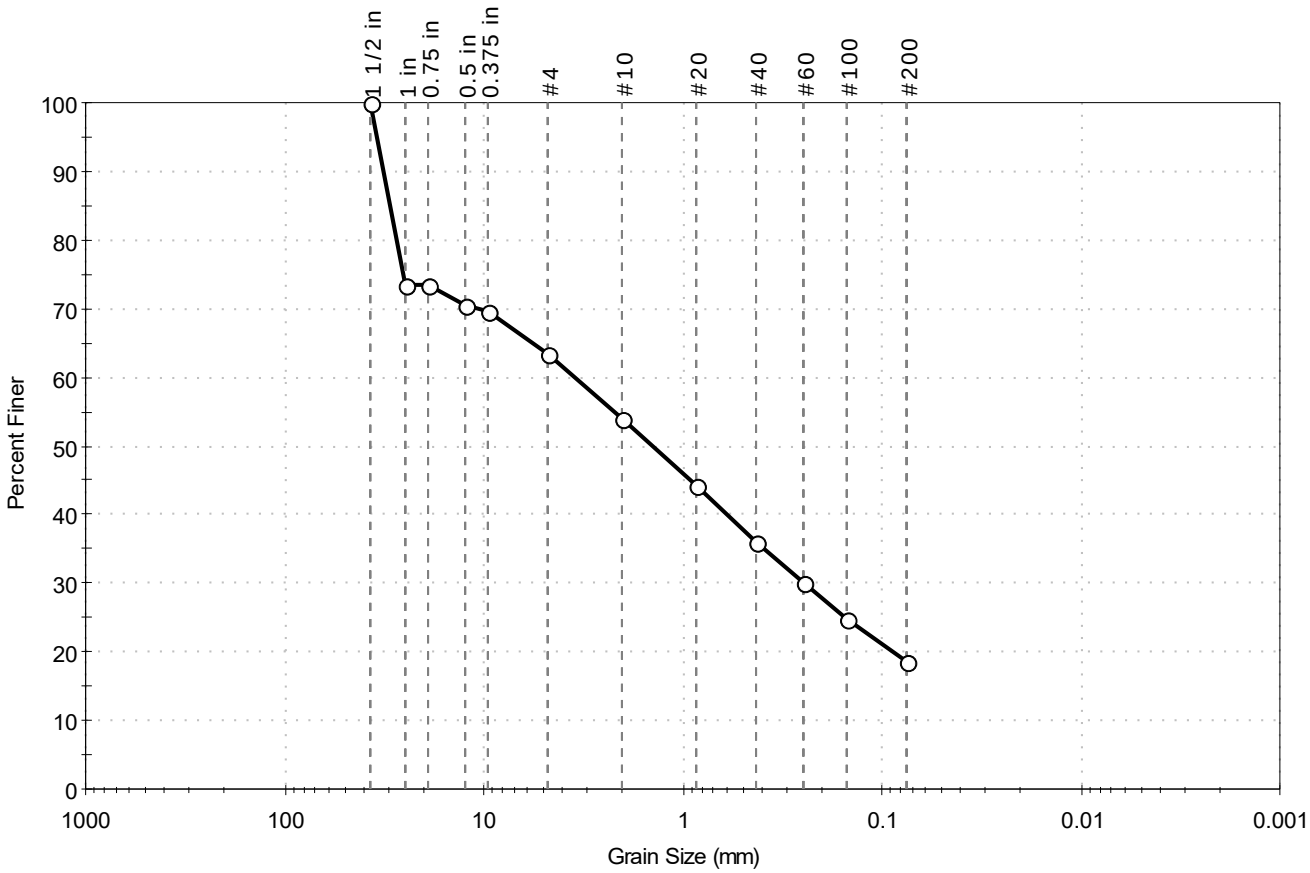
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:58 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-5	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-4	Test Date:	10/01/19	Checked By:	bfs
Depth :	6-8 ft	Test Id:	525250		
Test Comment:	---				
Visual Description:	Moist, dark gray silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	36.5	45.0	18.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 1/2 in	37.50	100		
1 in	25.00	73		
0.75 in	19.00	73		
0.5 in	12.50	70		
0.375 in	9.50	70		
#4	4.75	64		
#10	2.00	54		
#20	0.85	44		
#40	0.42	36		
#60	0.25	30		
#100	0.15	25		
#200	0.075	19		

Coefficients

D_{85} = 29.8577 mm D_{30} = 0.2452 mm

D_{60} = 3.4407 mm D_{15} = N/A

D_{50} = 1.4144 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

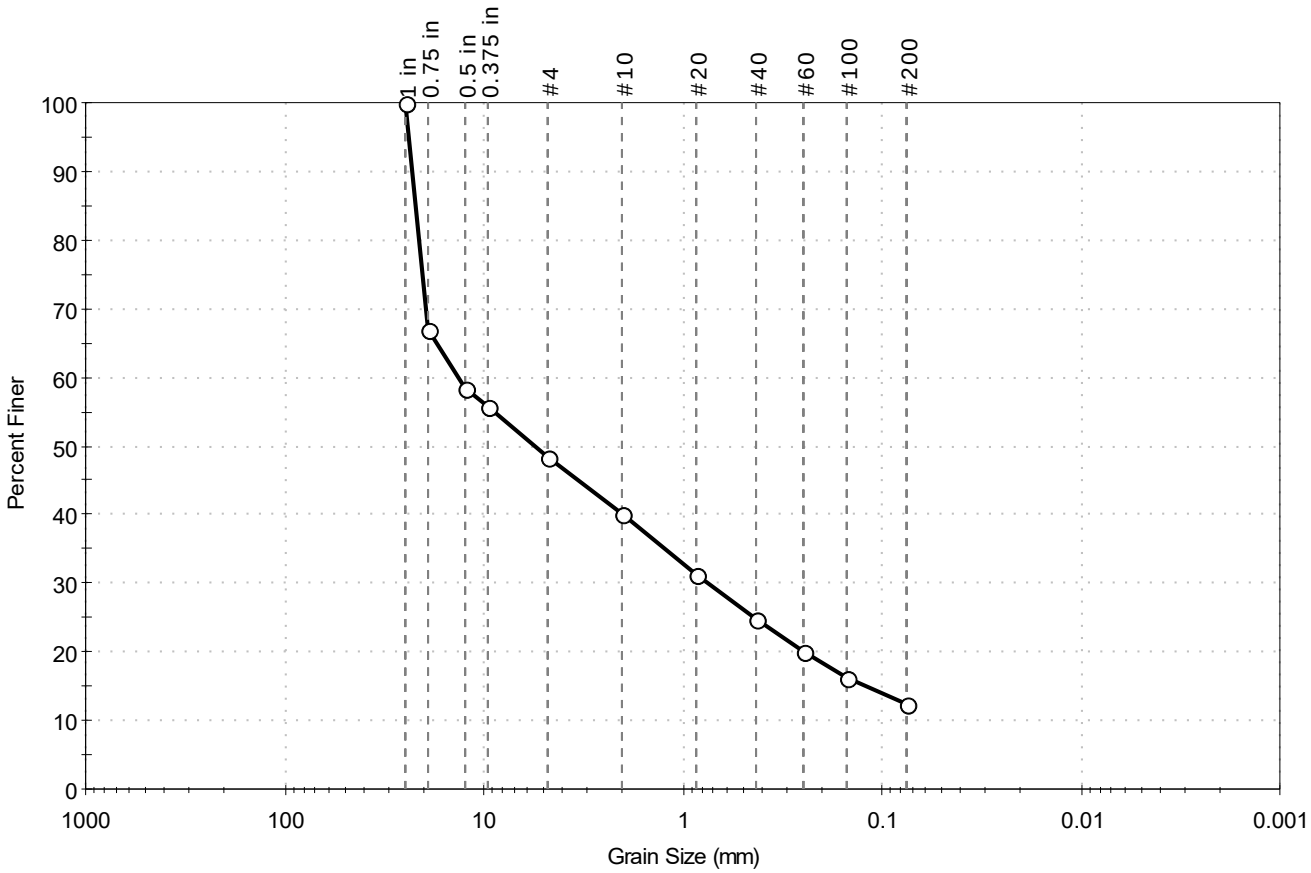
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:49:59 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-5	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-8	Test Date:	10/01/19	Checked By:	bfs
Depth :	19-21 ft	Test Id:	525251		
Test Comment:	---				
Visual Description:	Moist, brownish yellow silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	51.5	36.1	12.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	67		
0.5 in	12.50	58		
0.375 in	9.50	56		
#4	4.75	48		
#10	2.00	40		
#20	0.85	31		
#40	0.42	25		
#60	0.25	20		
#100	0.15	16		
#200	0.075	12		

Coefficients

D_{85} = 22.0771 mm D_{30} = 0.7395 mm

D_{60} = 13.5624 mm D_{15} = 0.1220 mm

D_{50} = 5.5113 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-a (0))

Sample/Test Description

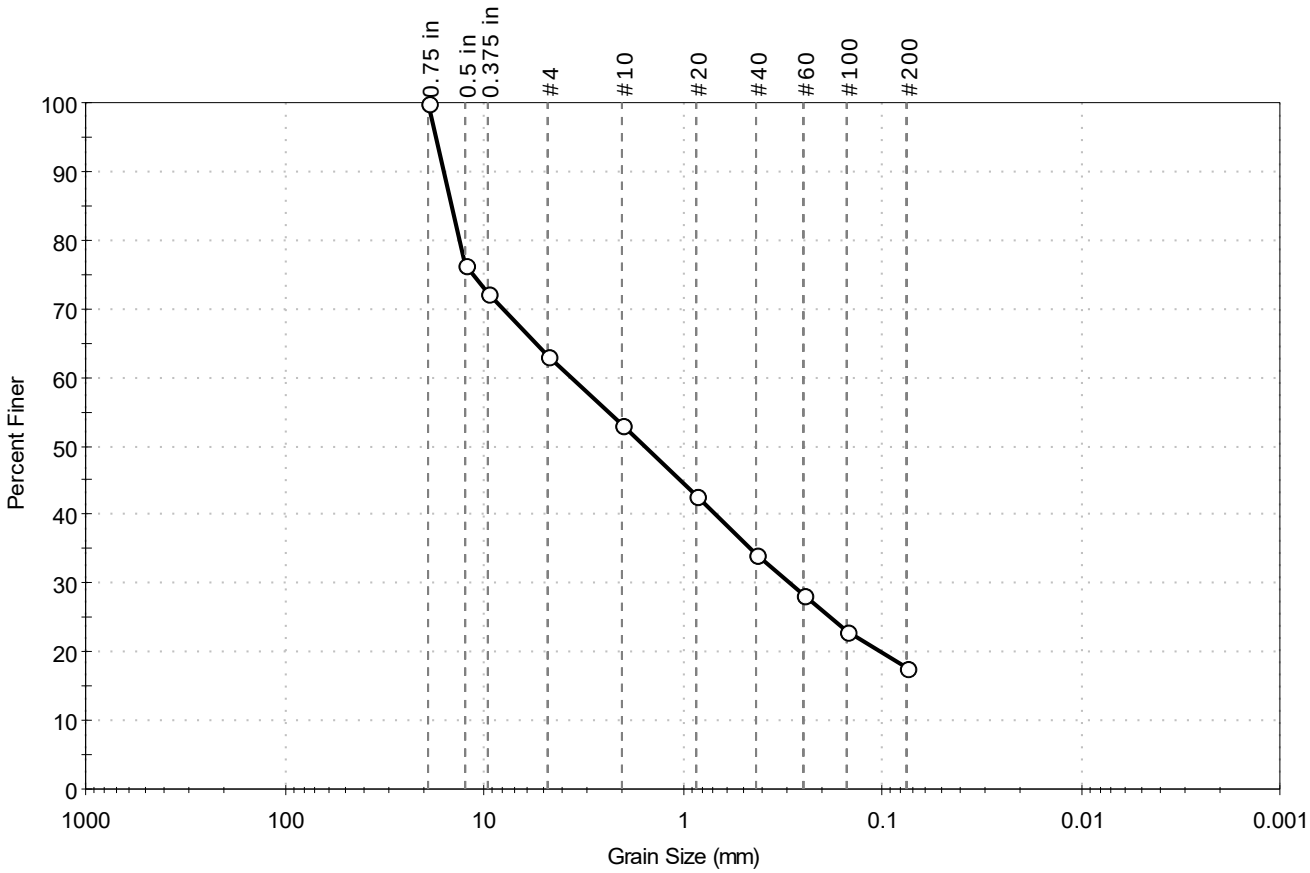
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:50:00 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-6A	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-5	Test Date:	10/02/19	Checked By:	bfs
Depth :	19-21 ft	Test Id:	525252		
Test Comment:	---				
Visual Description:	Moist, dark gray silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	36.8	45.4	17.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	76		
0.375 in	9.50	72		
#4	4.75	63		
#10	2.00	53		
#20	0.85	43		
#40	0.42	34		
#60	0.25	28		
#100	0.15	23		
#200	0.075	18		

Coefficients

D_{85} = 14.5804 mm D_{30} = 0.2915 mm

D_{60} = 3.6233 mm D_{15} = N/A

D_{50} = 1.5632 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

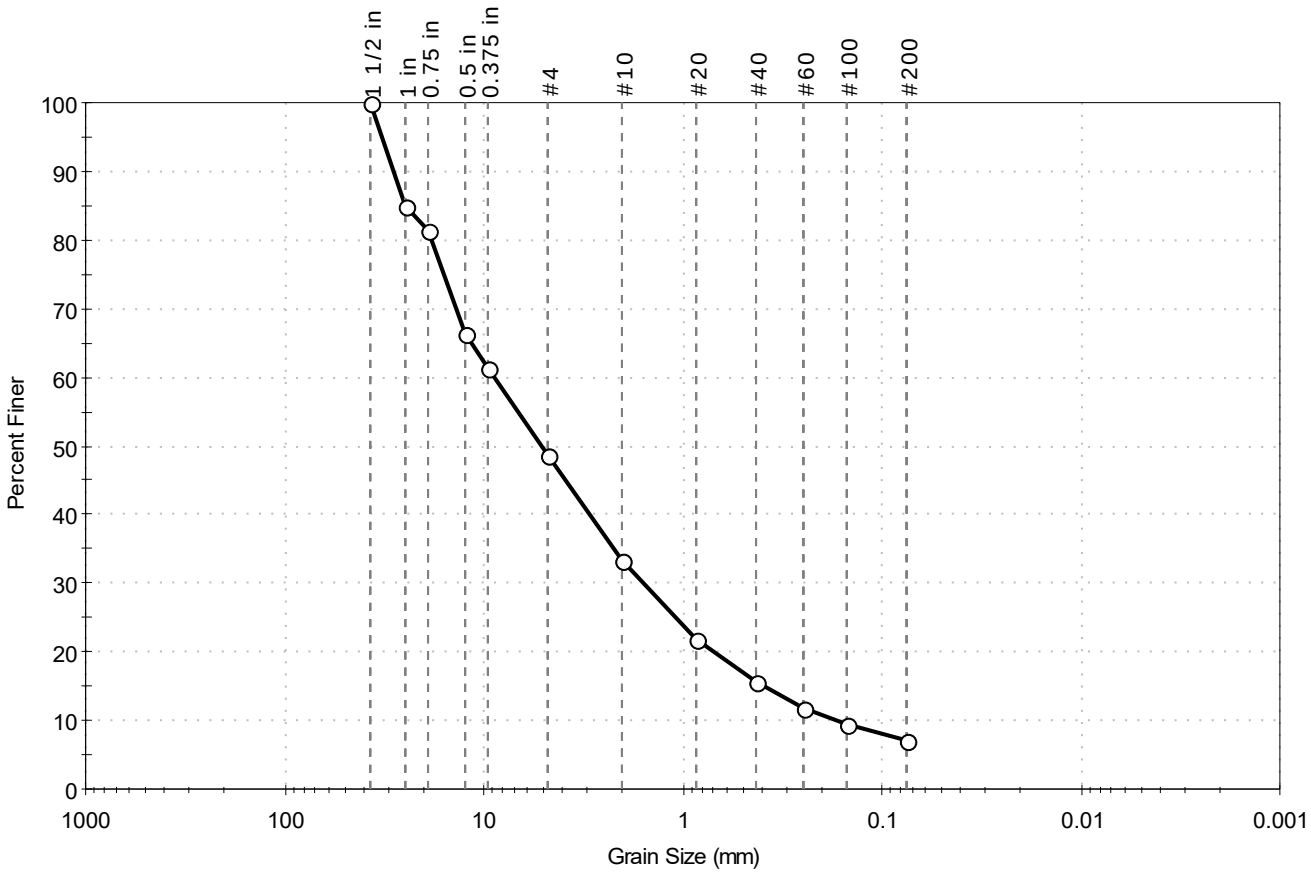
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:50:01 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-7	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-5	Test Date:	10/01/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	525253		
Test Comment:	---				
Visual Description:	Moist, brown gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	51.2	41.6	7.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 1/2 in	37.50	100		
1 in	25.00	85		
0.75 in	19.00	81		
0.5 in	12.50	66		
0.375 in	9.50	61		
#4	4.75	49		
#10	2.00	33		
#20	0.85	22		
#40	0.42	16		
#60	0.25	12		
#100	0.15	9		
#200	0.075	7.2		

Coefficients

D_{85} = 24.9033 mm D_{30} = 1.5670 mm

D_{60} = 8.8356 mm D_{15} = 0.3907 mm

D_{50} = 5.0743 mm D_{10} = 0.1719 mm

C_u = 51.400 C_c = 1.617

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample / Test Description

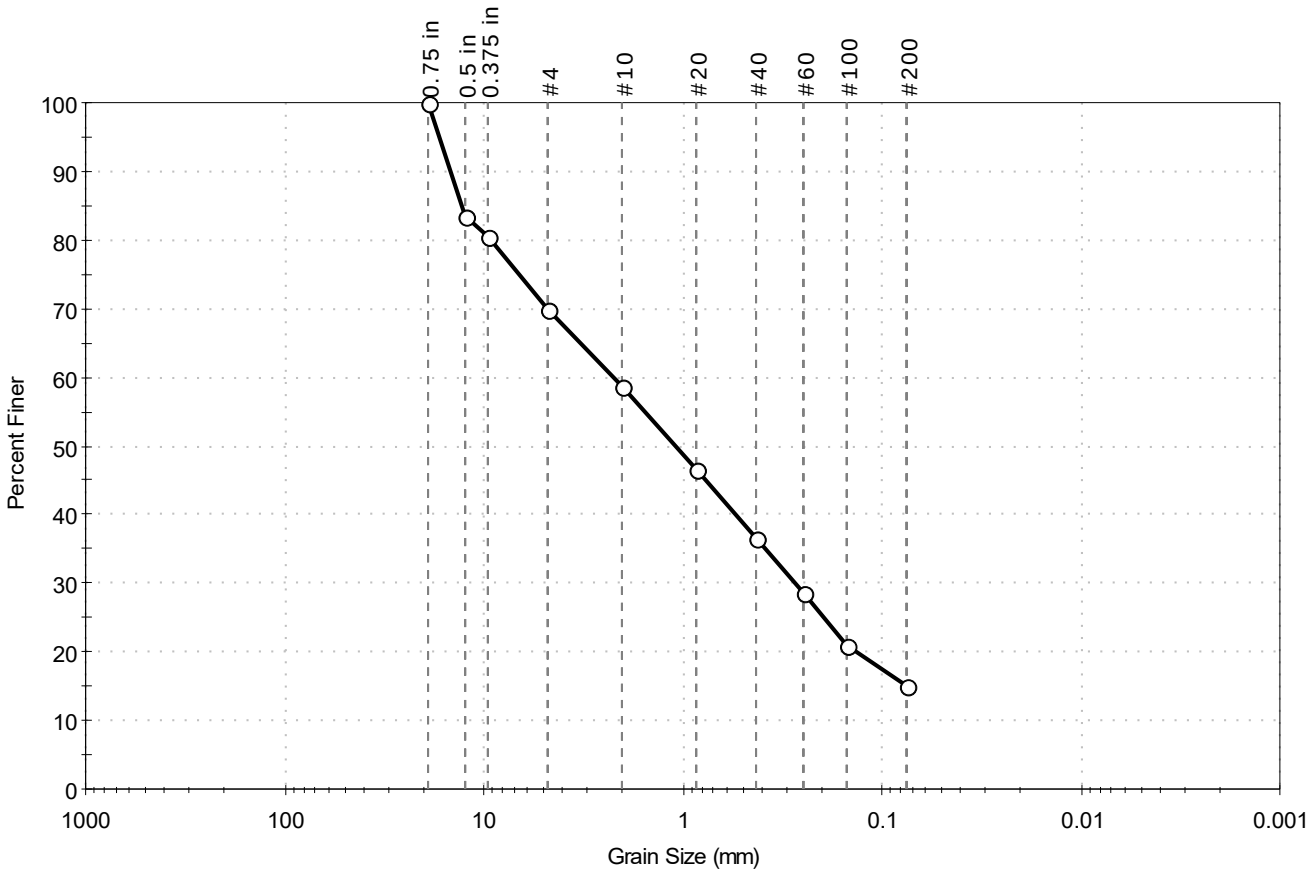
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:50:02 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-7	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-7	Test Date:	10/01/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	525254		
Test Comment:	---				
Visual Description:	Moist, yellowish brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	30.2	54.9	14.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	83		
0.375 in	9.50	80		
#4	4.75	70		
#10	2.00	59		
#20	0.85	46		
#40	0.42	37		
#60	0.25	29		
#100	0.15	21		
#200	0.075	15		

Coefficients

D_{85} = 13.0323 mm D_{30} = 0.2730 mm

D_{60} = 2.2099 mm D_{15} = 0.0755 mm

D_{50} = 1.0873 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

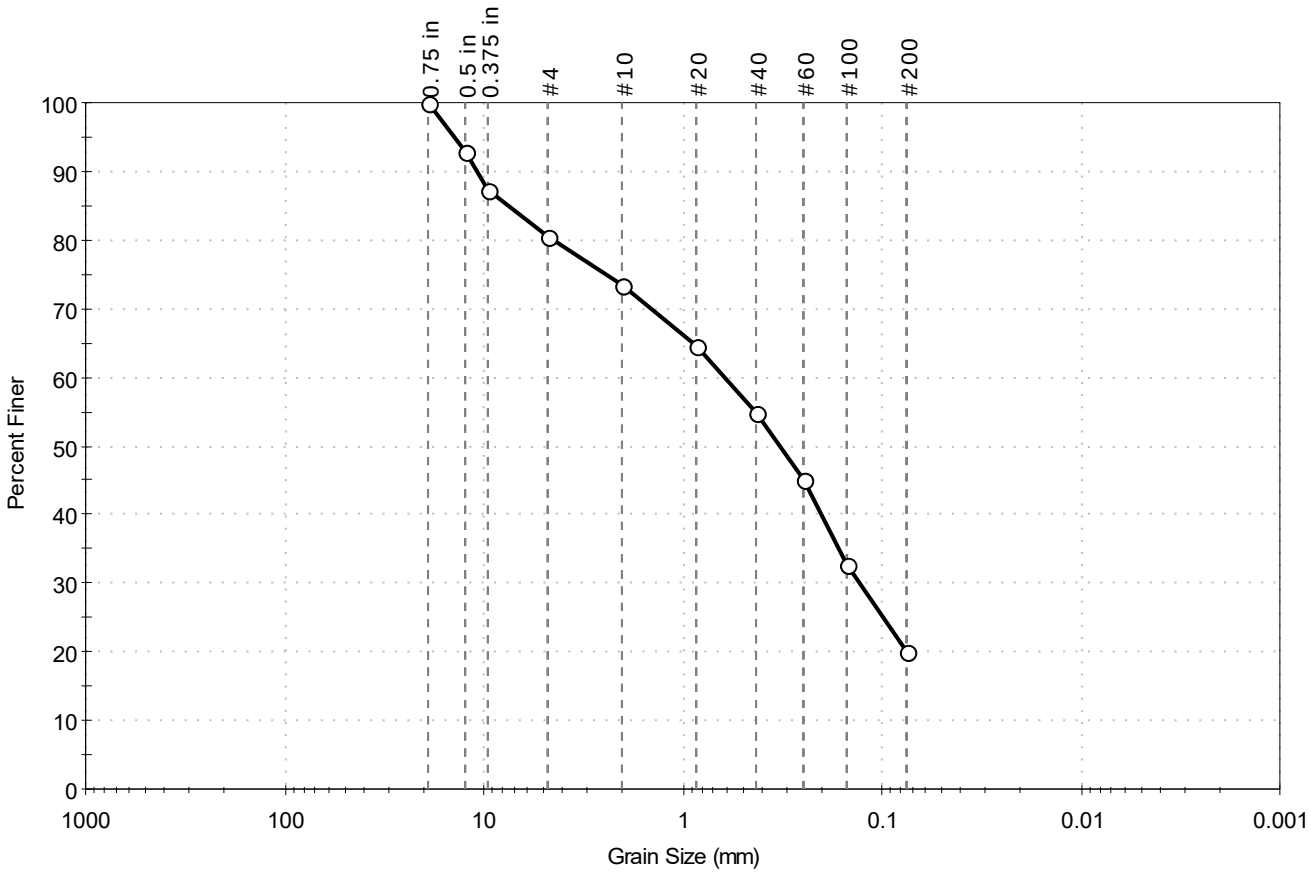
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:50:02 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation Conduits				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-8	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-3	Test Date:	10/01/19	Checked By:	bfs
Depth :	10-12 ft	Test Id:	525255		
Test Comment:	---				
Visual Description:	Moist, dark yellowish brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	19.4	60.5	20.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	93		
0.375 in	9.50	87		
#4	4.75	81		
#10	2.00	74		
#20	0.85	65		
#40	0.42	55		
#60	0.25	45		
#100	0.15	33		
#200	0.075	20		

Coefficients

D_{85} = 7.5492 mm D_{30} = 0.1285 mm

D_{60} = 0.6145 mm D_{15} = N/A

D_{50} = 0.3250 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

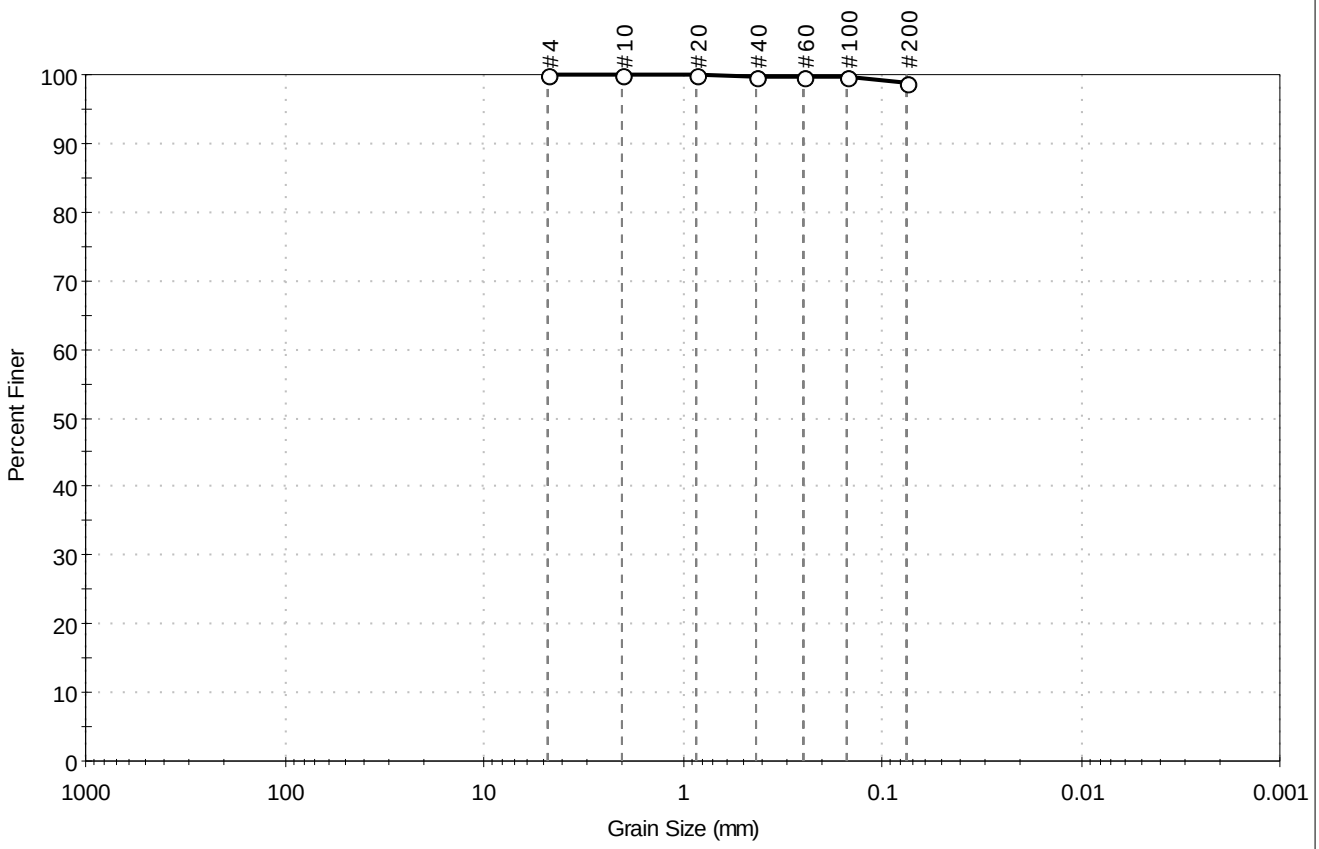
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 10/3/2019 3:50:03 PM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-9	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-4	Test Date:	03/06/20	Checked By:	jsc
Depth :	17-19	Test Id:	548429		
Test Comment:	---				
Visual Description:	Moist, dark gray silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	1.3	98.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	99		

Coefficients

D_{85} = N/A D_{30} = N/A

D_{60} = N/A D_{15} = N/A

D_{50} = N/A 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

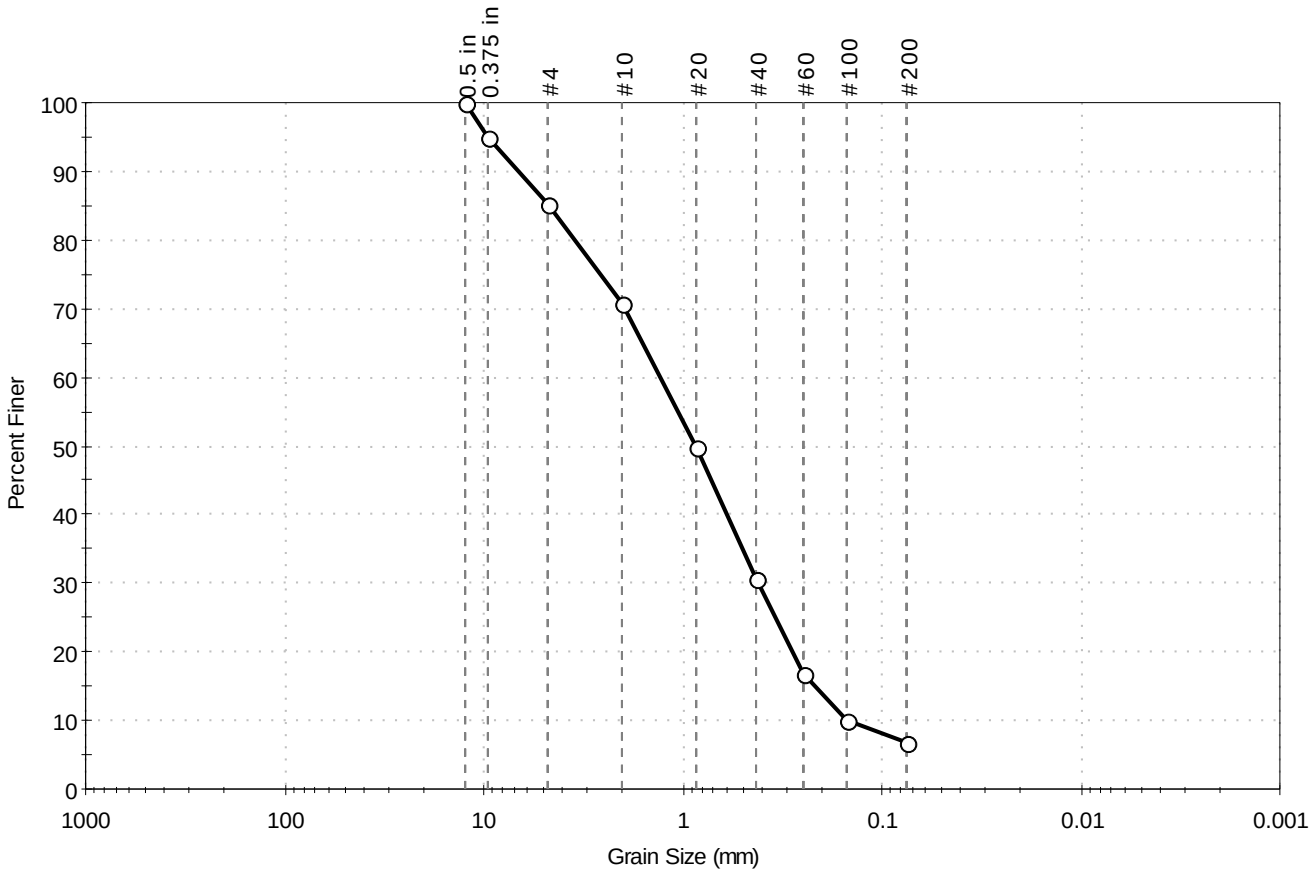
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

printed 3/9/2020 10:30:04 AM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-9	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-6	Test Date:	03/06/20	Checked By:	jsc
Depth :	21-23	Test Id:	548430		
Test Comment:	---				
Visual Description:	Moist, brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	14.7	78.5	6.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	95		
#4	4.75	85		
#10	2.00	71		
#20	0.85	50		
#40	0.42	31		
#60	0.25	17		
#100	0.15	10		
#200	0.075	6.8		

Coefficients

D_{85} = 4.6702 mm D_{30} = 0.4162 mm

D_{60} = 1.2858 mm D_{15} = 0.2161 mm

D_{50} = 0.8514 mm D_{10} = 0.1468 mm

C_u = 8.759 C_c = 0.918

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample / Test Description

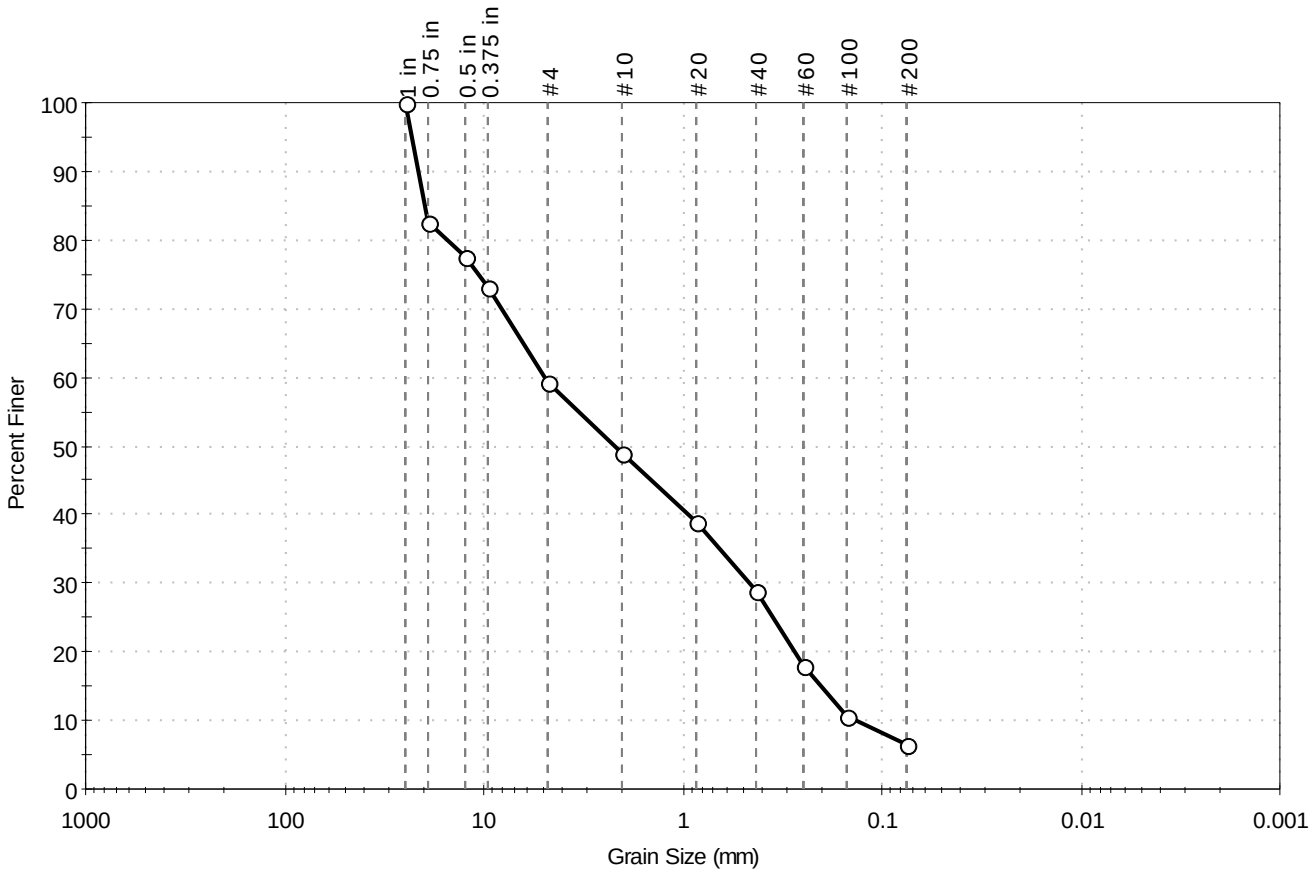
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 3/9/2020 10:30:05 AM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-10	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-6	Test Date:	03/06/20	Checked By:	jsc
Depth :	16-18	Test Id:	548431		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	40.6	52.9	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	83		
0.5 in	12.50	78		
0.375 in	9.50	73		
#4	4.75	59		
#10	2.00	49		
#20	0.85	39		
#40	0.42	29		
#60	0.25	18		
#100	0.15	11		
#200	0.075	6.5		

Coefficients

D_{85} = 19.7135 mm D_{30} = 0.4573 mm

D_{60} = 4.8886 mm D_{15} = 0.2036 mm

D_{50} = 2.1741 mm D_{10} = 0.1327 mm

C_u = 36.839 C_c = 0.322

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample / Test Description

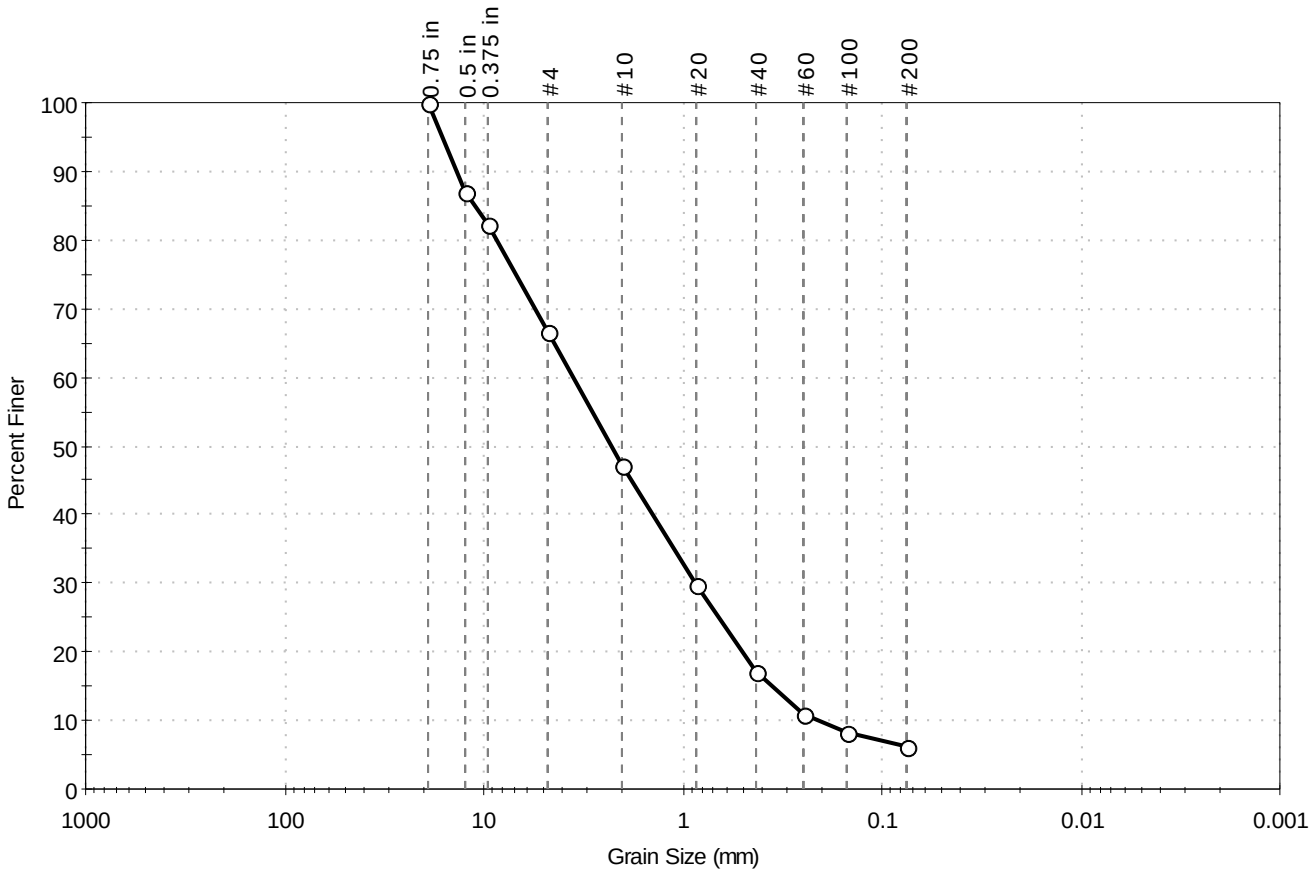
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 3/9/2020 10:30:06 AM

Client:	McMillen Jacobs Associates		
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C		
Location:	Providence, RI	Project No:	GTX-310677
Boring ID: B-11	Sample Type: jar	Tested By:	ckg
Sample ID: S-7	Test Date: 03/06/20	Checked By:	jsc
Depth : 19-21	Test Id: 548432		
Test Comment:	---		
Visual Description:	Moist, brown sand with silt and gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	33.2	60.5	6.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	87		
0.375 in	9.50	82		
#4	4.75	67		
#10	2.00	47		
#20	0.85	30		
#40	0.42	17		
#60	0.25	11		
#100	0.15	8		
#200	0.075	6.3		

Coefficients

D_{85} = 11.1640 mm D_{30} = 0.8586 mm

D_{60} = 3.5163 mm D_{15} = 0.3506 mm

D_{50} = 2.2608 mm D_{10} = 0.2069 mm

C_u = 16.995 C_c = 1.013

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample / Test Description

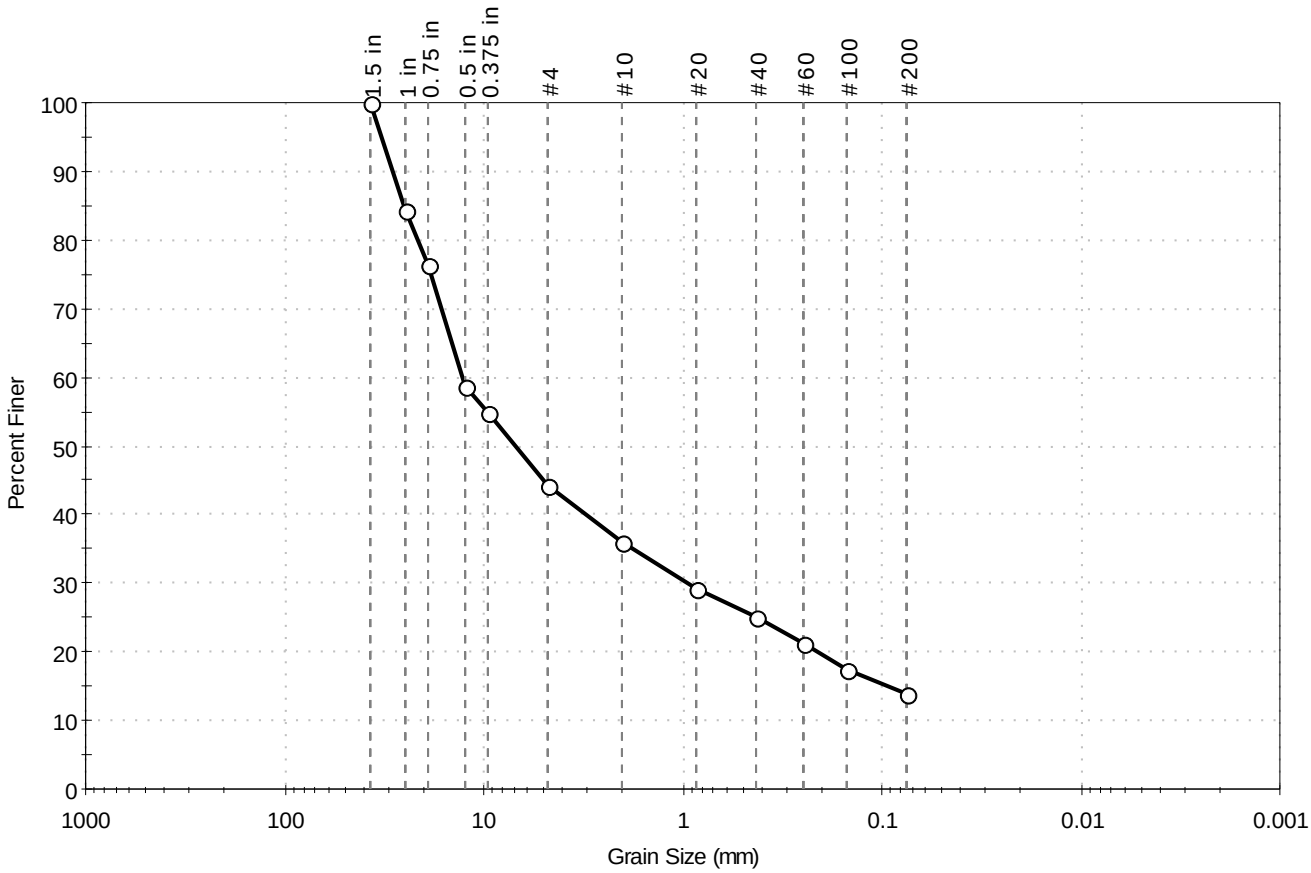
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 3/9/2020 10:30:07 AM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-12	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-7	Test Date:	03/06/20	Checked By:	jsc
Depth :	27-29	Test Id:	548433		
Test Comment:	---				
Visual Description:	Moist, dark olive gray silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	55.8	30.5	13.7

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	76		
0.5 in	12.50	59		
0.375 in	9.50	55		
#4	4.75	44		
#10	2.00	36		
#20	0.85	29		
#40	0.42	25		
#60	0.25	21		
#100	0.15	17		
#200	0.075	14		

Coefficients

D_{85} = 25.3728 mm D_{30} = 0.9231 mm

D_{60} = 12.8882 mm D_{15} = 0.0960 mm

D_{50} = 6.9001 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-a (0))

Sample / Test Description

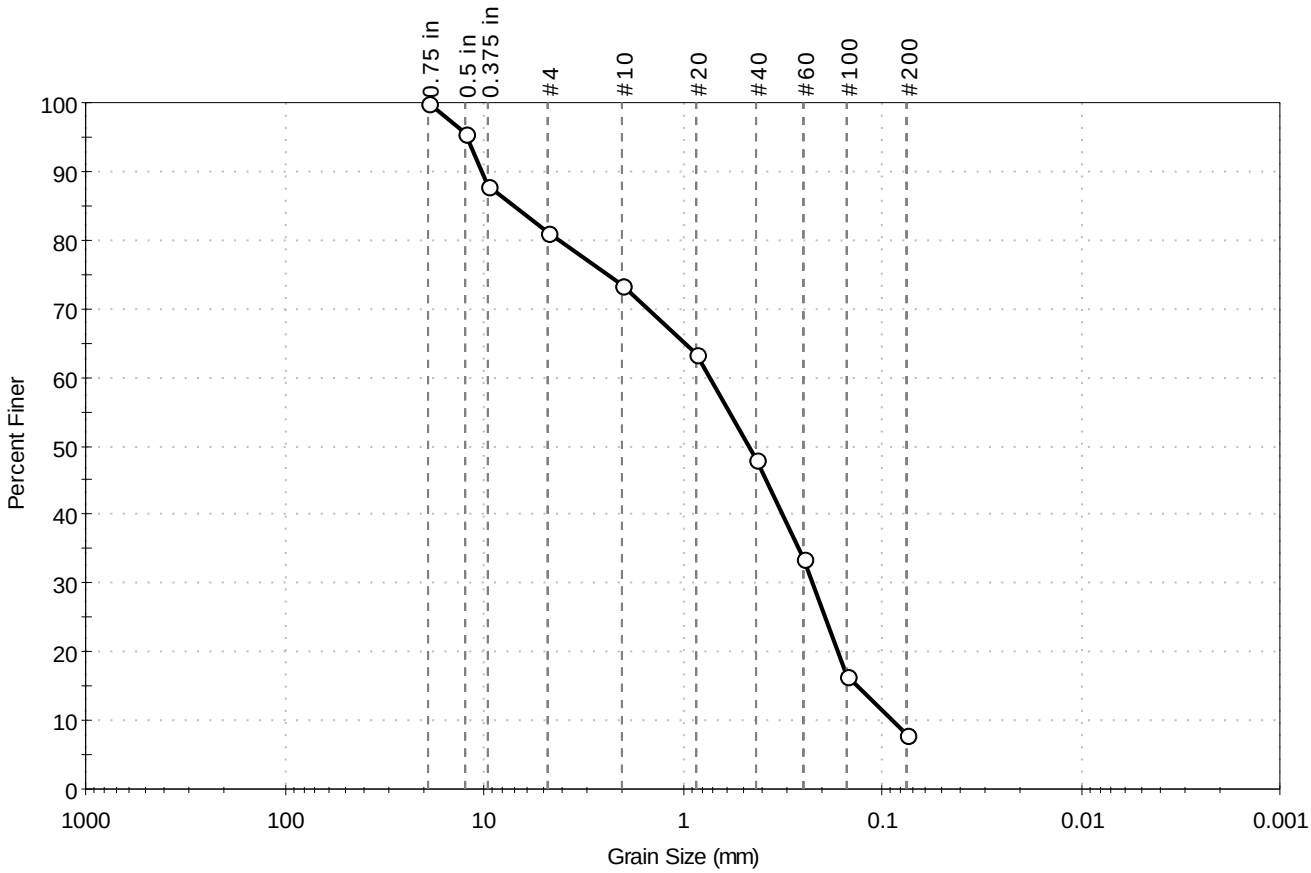
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 3/9/2020 10:30:08 AM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	B-13	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-2a	Test Date:	03/06/20	Checked By:	jsc
Depth :	8-10	Test Id:	548434		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	18.9	73.1	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	88		
#4	4.75	81		
#10	2.00	74		
#20	0.85	63		
#40	0.42	48		
#60	0.25	34		
#100	0.15	17		
#200	0.075	8.0		

Coefficients

D_{85} = 7.0320 mm D_{30} = 0.2241 mm
D_{60} = 0.7302 mm D_{15} = 0.1321 mm
D_{50} = 0.4624 mm D_{10} = 0.0883 mm
C_u = 8.270 C_c = 0.779

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

printed 3/9/2020 10:30:08 AM

Client:	McMillen Jacobs Associates				
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C				
Location:	Providence, RI			Project No:	GTX-310677
Boring ID:	---	Sample Type:	---	Tested By:	tlm
Sample ID:	---	Test Date:	03/03/20	Checked By:	smd
Depth :	---	Test Id:	547063		

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
B-9	C-1	29.89 - 30.27 ft	170	14240	3	Yes	---
B-10	C-1	22.29 - 22.67 ft	173	7325	2	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	McMillen Jacobs Associates	Test Date:	3/2/2020
Project Name:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C	Tested By:	cmh
Project Location:	Providence, RI	Checked By:	smd
GTX #:	310677		
Boring ID:	B-9		
Sample ID:	C-1		
Depth:	29.89-30.27 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.34	4.34	4.34
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	598.48		
Bulk Density, lb/ft^3	170	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00070	-0.00060	-0.00050	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00050	0.00060
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010

Difference between max and min readings, in:

0° = 0.00130 90° = 0.00010

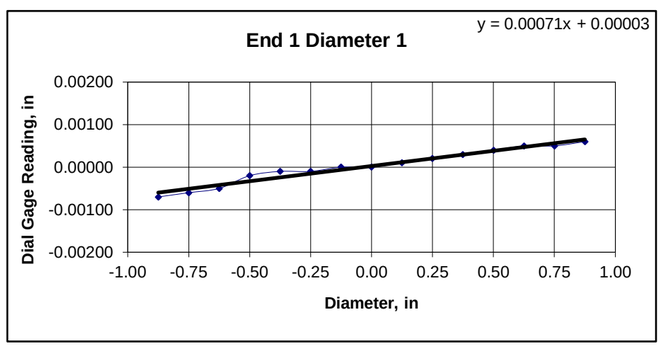
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00080	-0.00060	-0.00050	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00010	0.00010	0.00020	0.00030	0.00040	0.00060	0.00070
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010

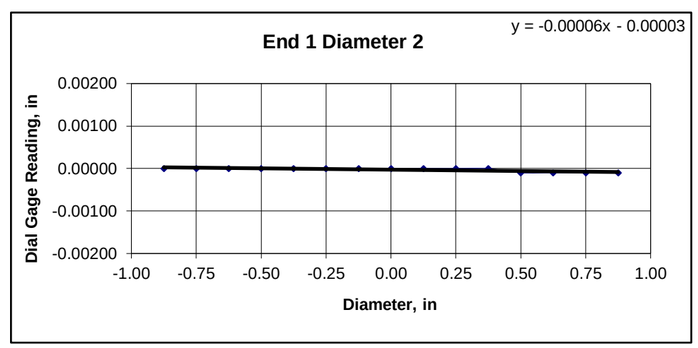
Difference between max and min readings, in:

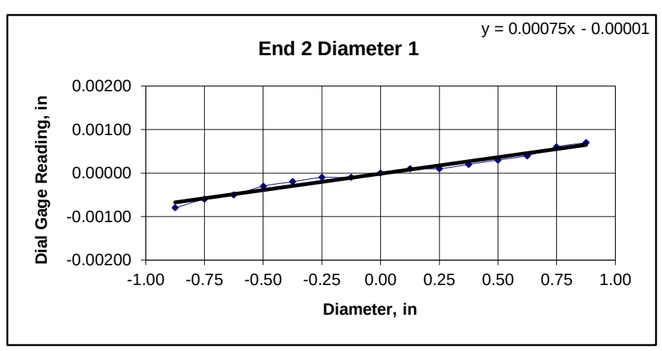
0° = 0.0015 90° = 0.0001

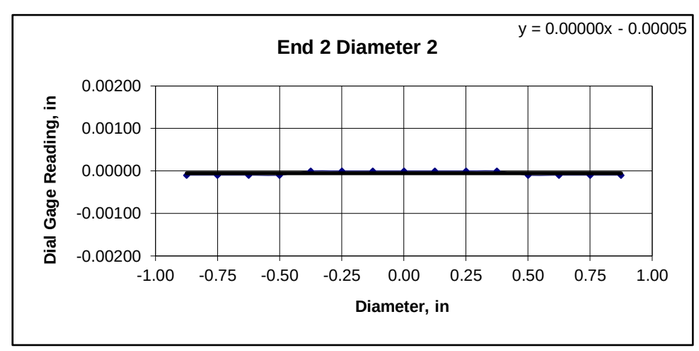
Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00075

Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00071
Angle of Best Fit Line:	0.04093

End 2:

Slope of Best Fit Line	0.00075
Angle of Best Fit Line:	0.04322

Maximum Angular Difference: 0.00229

Parallelism Tolerance Met? **YES**

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00006
Angle of Best Fit Line:	0.00360

End 2:

Slope of Best Fit Line	0.00000
Angle of Best Fit Line:	0.00000

Maximum Angular Difference: 0.00360

Parallelism Tolerance Met? **YES**

Spherically Seated

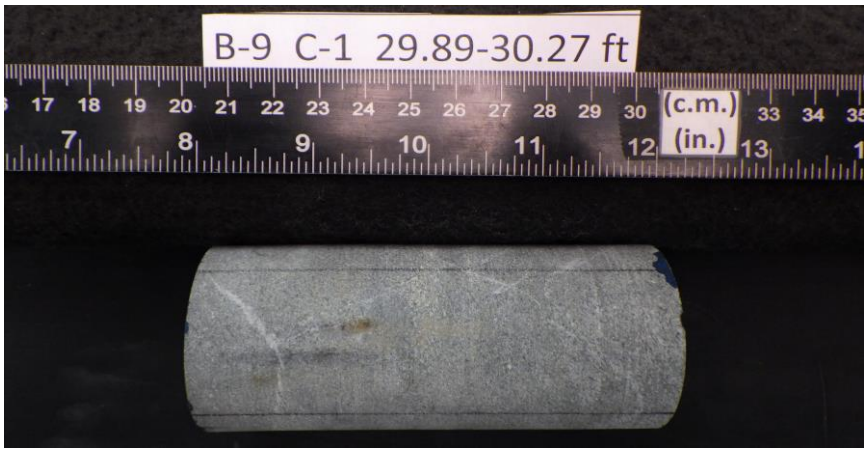
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00130	1.980	0.00066	0.038	YES
Diameter 2, in (rotated 90°)	0.00010	1.980	0.00005	0.003	YES
END 2					
Diameter 1, in	0.00150	1.980	0.00076	0.043	YES
Diameter 2, in (rotated 90°)	0.00010	1.980	0.00005	0.003	YES

Maximum angle of departure must be $\leq$ 0.25°

Perpendicularity Tolerance Met? **YES**

Client:	McMillen Jacobs Associates
Project Name:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C
Project Location:	Providence, RI
GTX #:	310677
Test Date:	3/3/2020
Tested By:	cmh
Checked By:	smd
Boring ID:	B-9
Sample ID:	C-1
Depth, ft:	29.89-30.27 ft



After cutting and grinding

After break

Client:	McMillen Jacobs Associates	Test Date:	3/2/2020
Project Name:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C	Tested By:	cmh
Project Location:	Providence, RI	Checked By:	smd
GTX #:	310677		
Boring ID:	B-10		
Sample ID:	C-1		
Depth:	22.29-22.67 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.44	4.44	4.44
Specimen Diameter, in:	1.97	1.96	1.97
Specimen Mass, g:	610.99		
Bulk Density, lb/ft^3	173	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.3	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00070	0.00070	0.00060	0.00050	0.00040	0.00020	0.00020	0.00000	0.00000	-0.00010	-0.00020	-0.00050	-0.00060	-0.00070	-0.00080
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00020

Difference between max and min readings, in:

0° = 0.00150 90° = 0.00020

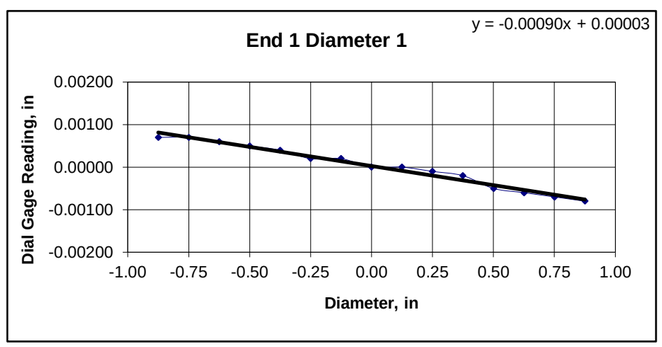
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00080	0.00070	0.00060	0.00050	0.00030	0.00020	0.00010	0.00000	0.00000	-0.00020	-0.00040	-0.00040	-0.00060	-0.00070	-0.00070
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010

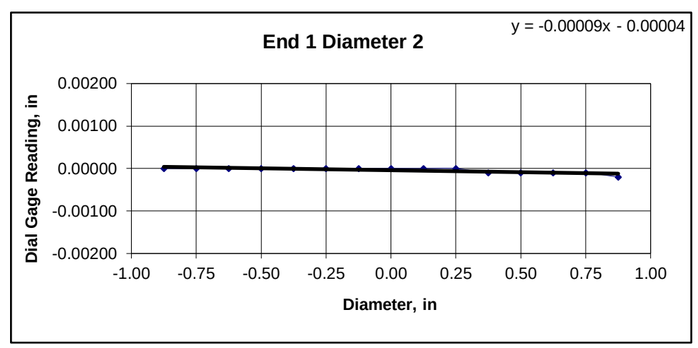
Difference between max and min readings, in:

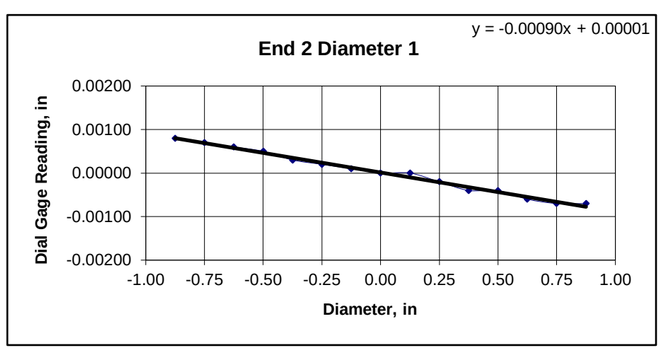
0° = 0.0015 90° = 0.0001

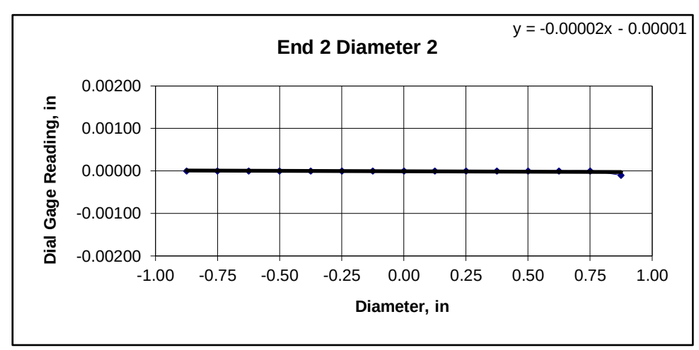
Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00075

Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00090
Angle of Best Fit Line:	0.05157

End 2:

Slope of Best Fit Line	0.00090
Angle of Best Fit Line:	0.05157

Maximum Angular Difference: 0.00000

Parallelism Tolerance Met? **YES**

Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00009
Angle of Best Fit Line:	0.00524

End 2:

Slope of Best Fit Line	0.00002
Angle of Best Fit Line:	0.00115

Maximum Angular Difference: 0.00409

Parallelism Tolerance Met? **YES**

Spherically Seated

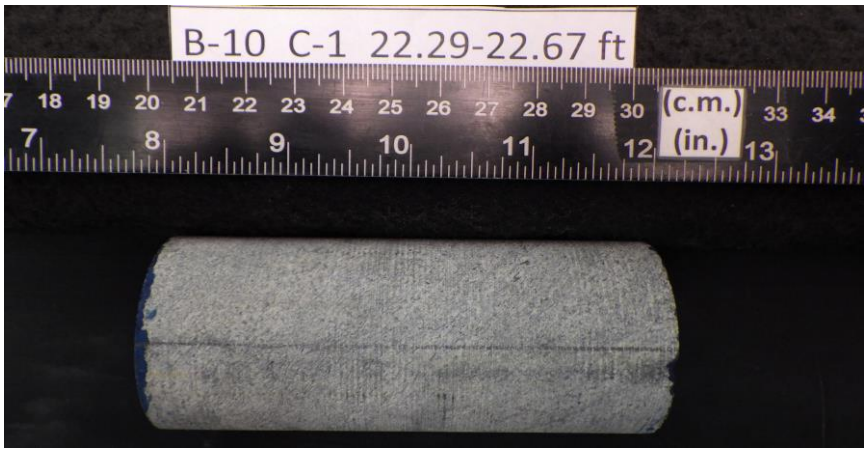
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00150	1.965	0.00076	0.044	YES
Diameter 2, in (rotated 90°)	0.00020	1.965	0.00010	0.006	YES
END 2					
Diameter 1, in	0.00150	1.965	0.00076	0.044	YES
Diameter 2, in (rotated 90°)	0.00010	1.965	0.00005	0.003	YES

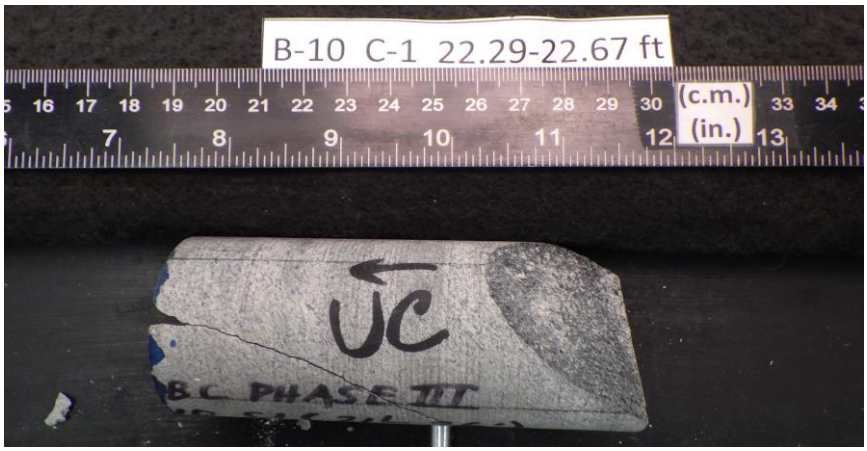
Maximum angle of departure must be $\leq$ 0.25°

Perpendicularity Tolerance Met? **YES**

Client:	McMillen Jacobs Associates
Project Name:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C
Project Location:	Providence, RI
GTX #:	310677
Test Date:	3/3/2020
Tested By:	cmh
Checked By:	smd
Boring ID:	B-10
Sample ID:	C-1
Depth, ft:	22.29-22.67



After cutting and grinding

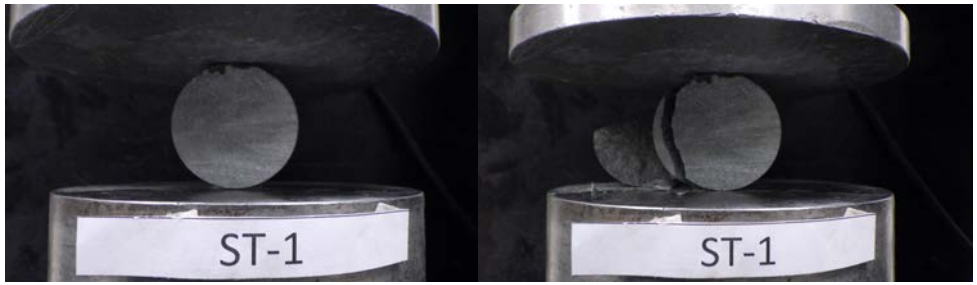


After break

Client:	McMillen Jacobs Associates		
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C		
Location:	Providence, RI	Project No:	GTX-310677
Boring ID: B-9	Sample Type: jar	Tested By:	tlm
Sample ID: C-1	Test Date: 03/02/20	Checked By:	smd
Depth : 29.8-30.4 ft	Test Id: 547064		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
29.80-29.88 ft	ST-1	1.21	1.99	0.61	4,872	1,290	1



Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

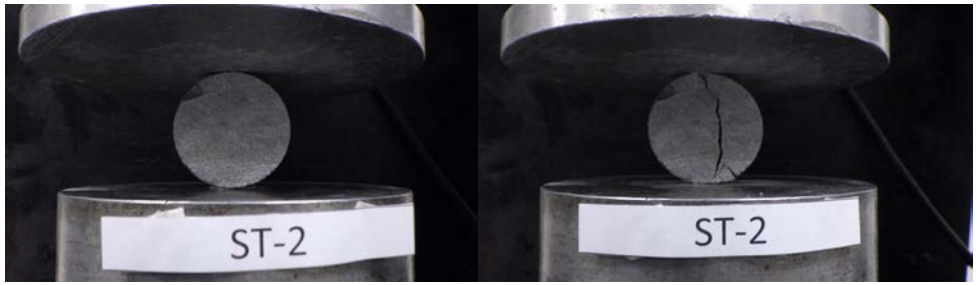
The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

Client:	McMillen Jacobs Associates		
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C		
Location:	Providence, RI	Project No:	GTX-310677
Boring ID: B-10	Sample Type: jar	Tested By:	tlm
Sample ID: C-1	Test Date: 03/02/20	Checked By:	smd
Depth : 22.2-22.7 ft	Test Id: 547065		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
22.20-22.28 ft	ST-2	1.00	1.97	0.51	4,478	1,440	1



Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

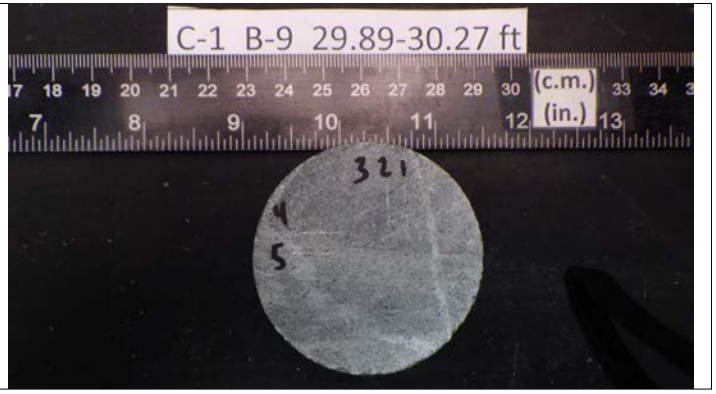
Client:	McMillen Jacobs Associates		
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C		
Location:	Providence, RI	Project No:	GTX-310677
Boring ID: B-9	Sample Type: jar	Tested By:	tlm
Sample ID: C-1	Test Date: 03/06/20	Checked By:	jsc
Depth : 29.8-30.4 ft	Test Id: 547281		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-9	C-1	29.89-30.27 ft	1	4.8	4.6	4.70	
			2	3.3	3.2	3.25	
			3	3.2	3.3	3.25	
			4	3.7	4.0	3.85	
			5	1.9	2.2	2.05	
			Average CAIs			3.42	
			Average CAI *			3.87	
					CERCHAR Abrasiveness Index Classification	**High abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



Client:	McMillen Jacobs Associates		
Project:	NBC CSO Phase III: IIIA-4 & IIIA-5 Consolidation C		
Location:	Providence, RI	Project No:	GTX-310677
Boring ID: B-10	Sample Type: jar	Tested By:	tlm
Sample ID: C-1	Test Date: 03/06/20	Checked By:	jsc
Depth : 22.2-22.7 ft	Test Id: 547282		
Test Comment: ---			
Visual Description: ---			
Sample Comment: ---			

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-10	C-1	22.29-22.67 ft	1	4.2	3.9	4.05	
			2	3.0	2.8	2.90	
			3	4.3	4.0	4.15	
			4	3.9	3.0	3.45	
			5	2.0	2.0	2.00	
			Average CAIs			3.31	
			Average CAI *			3.76	
					CERCHAR Abrasiveness Index Classification	**High abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:

APPENDIX B
Environmental Technical Memo

THIS PAGE INTENTIONALLY LEFT BLANK

Narragansett Bay Commission

Drop Shaft 213 Consolidation Conduit & OF-217 Consolidation Conduit

Phase III CSO Program: Contract IIIA-4 & IIIA-5

April 2021

ENVIRONMENTAL TECHNICAL MEMORANDUM

BETA
701 George Washington Hwy
Lincoln, Rhode Island 02865
401.333.2382
www.BETA-Inc.com

Drop Shaft 213 Consolidation Conduit & OF-217 Consolidation Conduit

Narragansett Bay Commission

Phase III CSO Program: Contract IIIA-4 & IIIA-5

ENVIRONMENTAL TECHNICAL MEMORANDUM

Prepared by: BETA GROUP, INC.
Prepared for: Stantec

April 2021

Revisions

Revision History

DATE	VERSION	DESCRIPTION	AUTHOR(s)	REVIEWER(s)	Date of Review(s)
4/3/20	1	Draft	McLoughlin	Ellis	4/7/20
5/13/20	2	Final	McLoughlin		
6/5/20	2	Final	McLoughlin		
4/13/21	3	Final	McLoughlin	Cronin	3/23/21

TABLE OF CONTENTS

1.0 Introduction and Purpose 1
2.0 Background 2
3.0 Soil Borings 10
3.1 Preparation 10
3.2 Soil Borings 10
3.3 Soil Analytical Data 12
4.0 Groundwater 13
4.1 Monitoring Wells 13
4.2 Groundwater Monitoring Well Development 13
4.3 Groundwater Classification 13
4.4 Groundwater Sampling 13
4.5 Groundwater Analytical Data 14
4.6 Hydrogeology 14
5.0 Project Monitoring 15
6.0 Conclusions 16

LIST OF TABLES

Table 1 Field Screening Data
Table 2 Soil Analytical Data
Table 3 Groundwater Analytical Results
Table 4 Groundwater Measurements and Elevations

LIST OF FIGURES

Figure 1 Site Locus Map
Figure 2 IIIA-4 Soil Borings
Figure 3 IIIA-5 Soil Borings
Site Plans
IIIA-4 Sheets C-5 through C-10
IIIA-5 Sheets C-4 through C-9

LIST OF APPENDICES

Appendix A EDR Regulatory Database Report Executive Summary
Appendix B Historic Reports
Appendix C Program Borings
Appendix D Site Specific Health and Safety Plan
Appendix E Soil Boring and Monitoring Well Logs
Appendix F Soil Laboratory Certificates of Analysis
Appendix G Groundwater Sampling Logs
Appendix H Groundwater Laboratory Certificates of Analysis
Appendix I RIDOT I-95 Draft ELUR and SMP

1.0 INTRODUCTION AND PURPOSE

BETA Group, Inc. (BETA) has prepared this Environmental Technical Memorandum (TM) to summarize the findings of the subsurface investigation program conducted in support of the Narragansett Bay Commission (NBC) Phase III Combined Sewer Overflow (CSO) Consolidation Conduit Projects, Contract IIIA-4 and IIIA-5.

The Consolidation Conduit projects are one component of the NBC Phase III CSO Program, which began in 2016 and is focused primarily on the Bucklin Point Service Area (BPSA) in the communities of Pawtucket and Central Falls. The overall NBC CSO Program is aimed at lowering annual CSO volumes and reducing annual shellfish bed closures in accordance with a 1992 Consent Agreement with the Rhode Island Department of Environmental Management (RIDEM). Phases I and II of this program, which focused on the Fields Point Service Area (FPSA) in Providence, were completed in 2008 and 2015, respectively. Stantec, along with Pare Corporation as subconsultant, is under contract with NBC to serve in the role as the Program Manager/Construction Manager (PM/CM) for the Phase III CSO Program. The Consolidation Conduit IIIA-4 and IIIA-5 projects include the design and construction of consolidation conduits, flow diversions, a gate and screening structure, flow meters, instrumentation panels, sluice gates, and other ancillary facilities necessary to convey flow from outfalls OF-210, OF-213, OF-214, and OF-217 to a drop shaft to be constructed under separate contract.

This TM summarizes the results of an environmental assessment of the subsurface soil and groundwater conducted in conjunction with a geotechnical subsurface exploration program in support of the project. Soil and groundwater samples were obtained during test boring explorations and were analyzed for contaminants that may affect the disposal of soil and groundwater. The results will be reviewed and will support recommendations for management of soil and groundwater encountered during proposed construction activities associated with the project. These recommendations will be included in the Basis of Design report and will be considered in development of the technical specifications and contract documents.

2.0 BACKGROUND

BETA requested a database search from Environmental Data Resources, Inc. (EDR) for the project area. The EDR report gives a listing of sites identified on select federal and state standard source environmental databases within the approximate search radii specified by ASTM Standard Practice for Environmental Site Assessments E1527-13. BETA reviewed each environmental database on a record-by-record basis to determine if certain sites identified in the EDR report could impact the proposed work in the project area. A copy of the executive summary of the EDR regulatory database report is included in Appendix A. Based on the review, BETA identified eight listed sites with the potential to impact the project area. BETA is currently working on two of the sites: Tidewater and Town Landing. The following summarizes relevant information from these two sites:

Tidewater (Contract IIIA-5, Station 7+00 to 18+00)

National Grid owns Parcels 54-826, 65-645, and 65-662 and the consolidation conduit will impact these properties. The subject parcels, often referred to as the Tidewater Property, are located east of Taft Street and north of Tidewater Street and is the site of a former manufactured gas plant (MGP). The properties are known to have soil and groundwater contamination associated with its former use and are listed as a "state Site" under RIDEM's Remediation Regulations (RIDEM Case No. 95-022). The former MGP operated from the 1880s until 1954 and coal was used as the principal fuel to produce coal gas. In the later years of operation (1954 until the late 1960s), the MGP produced gas using oil and propane.

The Site is generally vacant except for an active natural gas regulating station located on the southeast end of Tidewater Street on its south side, the former Power Plant used as an active switching station, and electric substation on the central portion of the Site. The Site is secured with a locked perimeter chain-link fence.

National Grid is currently progressing forward with a plan to construct a cap over the site as part of their Sitewide Remedy Design project. The design was submitted to RIDEM for review in August 2019. The project is expected to be an 18-month project scheduled to commence in Spring 2020 and be completed by October 2021. A second project includes substation construction and that project is estimated to start in July 2020. Demolition of the existing building is scheduled for July 2022. The National Grid Sitewide Remedy Design project is expected to be completed in part, coincident with the NBC OF-217 Consolidation Conduit construction project.

At the request of National Grid, no environmental sampling was conducted on the site as part of this project. Numerous investigations previously completed by National Grid are available for review. It is anticipated that National Grid will dictate requirements associated with soil management and dewatering treatment and disposal. Additional coordination with National Grid is required to define the requirements.

BETA reviewed a January 2011 "Site Investigation Data Report" prepared by GZA GeoEnvironmental, Inc. (GZA) for the Tidewater property and results from groundwater sampling GZA conducted in 2019. This report included laboratory data from numerous soil borings, test pits, and monitoring wells near the proposed layout on the Tidewater property. Appendix B contains a plan that highlights these sample locations and the proposed layout. The data indicated concentrations of arsenic, lead, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), cyanide, total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs) in soil. Appendix B contains tables that summarize the data from the sampling locations that are relevant to this project. These tables indicate the following contaminants in soil above RIDEM's standards with the maximum concentration listed:

- Lead: 19,000 milligrams per kilogram (mg/kg);
- Arsenic: 40.7 mg/kg
- Total Petroleum Hydrocarbons: 5,200 mg/kg
- Polychlorinated biphenyls: 1.6 mg/kg
- Total Cyanide: 2,800 mg/kg
- Fluoranthene: 22.4 mg/kg
- Pyrene: 20.9 mg/kg
- Benzo [a] Anthracene: 10.1 mg/kg
- Chrysene: 9.3 mg/kg
- Benzo [b] Fluoranthene: 12.7 mg/kg
- Benzo [k] Fluoranthene: 7.44 mg/kg
- Benzo [a] Pyrene: 8.55 mg/kg
- Indeno [1,2,3-cd] Pyrene: 3.97 mg/kg
- Dibenzo [a,h] Anthracene: 1.63 mg/kg
- Benzo [g,h,i] Perylene: 3.4 mg/kg

These tables also indicate the following contaminants in groundwater above RIDEM's standards with the maximum concentration listed:

- Benzene: 5,200 micrograms per kilogram (µg/L);
- Naphthalene: 8,200 µg/L
- Ethylbenzene: 3,900 µg/L

The combined concentrations of these VOCs exceed the NBC's Total Toxic Organics discharge limit for discharge to the Bucklin Point treatment plant. Although not above RIDEM standards, GZA's groundwater sampling also identified elevated concentrations of TPH, arsenic, cyanide, and other VOCs.

Based on this data, it is likely that contaminated soil and groundwater will be encountered during excavation work on this property. Furthermore, the possibility exists of soil to be classified as hazardous waste within this area. Furthermore, it is likely that dewatering effluent from the Tidewater area will require treatment prior to discharge to the NBC's system.

Town Landing (Contract IIIA-5, Stations 0+00 to 6+00)

BETA reviewed a "Site Investigation Report/Targeted Brownfields Assessment" prepared by Fuss & O'Neill for this property. Appendix B includes a copy of this report which included laboratory data from four soil borings and two monitoring wells near the proposed layout on the Town Landing property. Fuss & O'Neill's report includes figures and data tables for these borings and monitoring wells. The laboratory data identified exceedances of RIDEM's Residential and Industrial/Commercial Exposure Criteria (RDEC and I/C DEC) for lead and PAHs in soil. The following summarizes the maximum detected concentration in soil:

- Lead: 460 milligrams per kilogram (mg/kg);
- Pyrene: 18 mg/kg
- Benzo [a] Anthracene: 9.5 mg/kg
- Chrysene: 8.9 mg/kg
- Benzo [b] Fluoranthene: 7 mg/kg
- Benzo [k] Fluoranthene: 8.6 mg/kg
- Benzo [a] Pyrene: 9.1 mg/kg
- Indeno [1,2,3-cd] Pyrene: 4.8 mg/kg
- Benzo [g,h,i] Perylene: 3.8 mg/kg

The data did not identify any contaminants in groundwater above RIDEM's GA criteria or NBC's Bucklin Point discharge limits.

On June 6, 2019, BETA reviewed files at the Rhode Island Department of Environmental Management (RIDEM) for the other six listed sites within or proximate to the project area. The following summarizes information reviewed in RIDEM's files:

Lawn Terrace Apartments, 180-226 Pleasant Street (Contract IIIA-5, Stations 0+00 to 6+00)

The RIDEM file contained a 2005 "Closure Report" prepared by VHB for a release of mercury at this property. Based on the reviewed information, the mercury release does not appear to pose a threat to the project. However, this report discusses previous issues at this property related to arsenic and polynuclear aromatic hydrocarbons (PAHs) associated with coal and wood ash in soil at the property. Levine Fricke Recon (LFR) completed a Remedial Action Work Plan that consisted of a cap and the implementation of an Environmental Land Use Restriction (ELUR).

Additionally, each of the buildings at this property had a previous petroleum underground storage tank (UST) that was replaced with a new UST in 1999. RIDEM's records do not indicate a release has occurred from the USTs at this property. Based on the information reviewed, it appears that the environmental issues at this property (arsenic and PAHs in soil) may extend into Taft Street and, thus, have the potential to impact the project.

Adams Furniture, 65 East Avenue (Contract IIIA-4, Station 6+00)

Impacted soil was encountered during the removal of a UST from this property. Soil was excavated and soil and groundwater samples did not exceed applicable RIDEM standards. Based on these results and the distance of this property from the project area, this release does not likely pose a threat to the project.

Pet Food Experts, 175 Main Street (Contract IIIA-4, Station 10+00)

Environmental assessments at this property have identified PAHs and total petroleum hydrocarbons (TPH) in soil above RIDEM Residential Direct Exposure Criteria (RDEC). A soil boring closest to the project area contained PAHs above RIDEM's RDEC. Redevelopment of this property in 2015 included construction of a cap and the implementation of an ELUR. The proximity of this site to the northern limit of the project area and the known contaminant concentrations indicate the possibility of similar "urban fill" soil to exist in this portion of the project area.

Roosevelt Avenue Disposal, Roosevelt Avenue Extension (Contract IIIA-4, Station Unknown)

This release consisted of the identification of illegally dumped asbestos-containing building materials in a dumpster on Roosevelt Avenue Extension. RIDEM required removal and proper disposal of the materials. Based on this information, this release does not represent a concern to the project.

Pawtucket Bridge #550, Route 95 (Contract IIIA-4, Station 4+00[S] to 5+00[S])

RIDEM's file contained a letter from RIDEM approving a Remedial Action Work plan for Pawtucket Bridge #550. BETA reviewed reports relating to the project including an August 2009 "Site Investigation Report" for the Rhode Island Department of Transportation's Pawtucket Bridge #550 Replacement and Improvements project prepared by Wright-Pierce, Inc. This report included results from two soil borings (WP-7 and WP-8) that were advanced in Taft Street under the Route 95 bridge and just north of Division Street. Laboratory analysis of a soil sample from WP-7 (5 to 7 feet below grade) identified arsenic, lead, chrysene, and benzo(a)pyrene above RIDEM's RDEC. Laboratory analysis of a second soil sample from WP-7 (9 to 10 feet below grade) identified chrysene above RIDEM's RDEC. Laboratory analysis of a soil sample from WP-8 (10 to 12 feet below grade) identified arsenic above RIDEM's RDEC. Sampling of groundwater from a well installed in boring WP-7 did not identify contaminants above RIDEM's GB groundwater criteria.

A Remedial Action Work Plan prepared by Wright Pierce, Inc. indicated that an ELUR would likely be filed for the Taft Street bridge abutment area; however, a copy of the ELUR was not in RIDEM's file. Mr. Jeff Crawford of RIDEM indicated that the ELUR had not yet been filed for this area. BETA was provided with a draft of the ELUR and Post Remediation Soil Management Plan (SMP). Appendix H contains a copy of the draft documents.

Based on the information reviewed, it is likely that contaminated soil will be encountered during excavation work in this area. Furthermore, even though the ELUR has not been filed, work in this area should adhere to the provisions of the ELUR and SMP which include:

- Notification to RIDEM prior to initiating work;
- Appropriate work health and safety provisions;
- Reuse of soil is allowed;
- Dust suppression during excavation;
- Excess soil to be placed on and covered with 10 mil poly sheeting;
- Equipment decontamination; and
- Restoration of areas to their original conditions.

Sovereign Bank, 210 Main Street (Contract IIIA-4, Station 10+00)

RIDEM's file contained a November 12, 2001 "Limited Subsurface Investigation" report by Lincoln Environmental, Inc. Soil and groundwater testing at this property identified petroleum above RIDEM's standards in the northwestern portion of this property. The borings and wells closest to the project area did not contain any exceedances of the RIDEM standards. Based on these results and this property's distance from the project area, it is unlikely that impacted soil from this release will be encountered during construction.

Historical Research

BETA requested copies of historical United States Geologic Survey (USGS) topographic maps for the Site from EDR. EDR provided 1894, 1915, 1921, 1935, 1938, 1939, 1941, 1942, 1943, 1944, 1947, 1949, 1957, 1970, 1971, 1975, 1979, 1987, 1996, 1998 and 2012 USGS Topographic Maps. A copy of the topographic map report can be provided upon request. Due to the scale of these maps, specific site information could not be ascertained. These maps do indicate that the roadways in the northern portion of the Site have been reconfigured over time.

BETA requested copies of historical aerial photographs for the Site from EDR. EDR provided copies of 1939, 1951, 1955, 1962, 1969, 1970, 1975, 1981, 1985, 1995, 2005, 2008, 2012, and 2016 aerial photographs. A copy of the EDR aerial photograph report can be provided upon request. Other than the presence of large tanks and industrial activity at the Tidewater site and significant development at the Town Landing site, due to the scale of these maps, detailed site information could not be ascertained. These photographs indicate that the current layout of roadways in the northern portion of the Site first appeared in the 1969 photograph.

Historical City directories and Cross Reference directories are often useful for obtaining historical tenants for a property. City directories provide tenant listings, by address, for every year covered by the directory service. EDR provided copies of 1938, 1943, 1948, 1953, 1958, 1964, 1974, 1979, 1984, 1989, 1992, 1995, 2000, 2005, 2010, and 2014. A copy of the EDR City Directory Abstract can be provided upon request. These directories list industrial and commercial enterprises (electric companies, auto repair, junk dealer, lumber yard, machine shops, a box company, a tire supply company, and a municipal garage) within the project area. Due to reconfiguration of the roadways and the renumbering of properties, these listings could not be located geographically with any accuracy. These listings confirm the known, long history of urban use within the project area.

Sanborn maps identify prior Site uses of real property for many cities and towns in the United States. The maps were originally created to assist insurance underwriters in understanding the potential fire risk of structures requiring insurance; however, they are also useful for determining the previous uses of a property. Sanborn maps often contain information relating to uses of individual structures, location of certain fuel storage tanks, chemical storage tanks, or both, and storage of other potentially toxic substances. BETA requested copies of Sanborn maps for the Site from EDR which provided copies of 1884, 1890, 1902, 1923, 1949, and 1984 Sanborn maps. Copies of the Sanborn maps can be provided upon request. The following provides a summary of relevant information, as it relates to the project site, from these maps.

- The 1902, 1923, 1949, and 1984 Sanborn maps depict an electric generating station on the east side of Roosevelt Avenue Extension in the northern portion of the project area. In 1902, this property was occupied by the "Pawtucket Electric Company" and in 1923, 1949, and 1984 by the "Blackstone Valley Electric Company." This generating station still exists at this location and is currently owned by National Grid.
- The 1890 Sanborn map depicts the "Jas. Davis Belting Co." tannery in the current location of Roosevelt Avenue Extension near its intersection with Jenks Way.
- The 1923 Sanborn map depicts an area labeled "coal pockets" on the Town Landing property on east side of Taft Street. Coal and coal ash can be sources of polynuclear aromatic hydrocarbons and metals.
- The 1949 Sanborn map depicts a "filling station" west of Taft Street and north of Division Street.
- The 1949 and 1984 Sanborn maps depict a "Tin Shop," "Auto Spring M'fg," and "Auto Body Rep" shops north of the current location of the Route 95 bridge.th

Program Borings

In May 2018, Pare and Stantec advanced borings in the project area and in areas on the eastern side of the Seekonk and Blackstone Rivers. Of these borings, seven were within or proximate to the project area. The following describes the boring locations which are depicted on the "Boring Location Plan" in Appendix C.

- B17-8 and B-17-8A: In the sidewalk south of Jenks Way;
- B17-39: In the sidewalk north of Jenks Way;
- B17-40: In Main Street, north of the project limits;
- B17-41: In Taft Street, south of Division Street;
- B17-45: In Jenks Way, west of the intersection of Jenks Way and Taft Street;
- B17-46: In Jenks Way, west of the project limits; and
- B17-46A: In Jenks Way, near B17-46.

We have included the laboratory data for soil and groundwater samples from these borings in Appendix C. The following summarizes the relevant data by location:

B17-8 and B17-8A

Groundwater sampling from a well in this location (on the former Masonic Temple property) identified tetrachloroethene (2,060 micrograms per liter [µg/L]) above RIDEM's GA and GB groundwater objectives. Trichloroethene (238 µg/L) was identified above RIDEM's GA groundwater objective. The combined concentrations of these VOCs exceed the NBC's Total Toxic Organics discharge limit for discharge to the Bucklin Point treatment plant. Soil samples were not collected from these borings. Additional groundwater monitoring wells are being installed on the former Masonic Temple by the Program Manager to determine the extent of contamination in this area.

B17-39

Five soil samples were submitted for analysis of VOCs, SVOCs, TPH, metals, and PCBs. The laboratory identified benzo(a)pyrene (0.934 mg/Kg) and lead (2,340 mg/Kg) above both the RIDEM RDEC and I/CDEC in the 0-2 foot sample. The laboratory also identified lead (234 mg/Kg) above the RIDEM RDEC in the 8-10 foot sample,), benzo(a)pyrene (0.474 and 0.439 mg/Kg) above the RDEC in the 4-6 and 6-8 foot samples, benzo(b)fluoranthene (0.924 mg/Kg) above the RDEC in the 0-2 foot sample, and dibenzo(a,h)anthracene (1.05, 0.459. and 0.510 mg/Kg) above the RDECE in the 0-2, 4-6, and 6-8 foot samples.

B17-40

Five soil samples were submitted for analysis of VOCs, SVOCs, TPH, metals, and PCBs. The laboratory identified benzo(a)pyrene (0.439 mg/kg) and chrysene (0.432 mg/Kg) above the RIDEM RDEC in the 0-2 foot sample.

B17-41

Four soil samples were submitted for analysis of VOCs, SVOCs, TPH, metals, and PCBs. The laboratory identified benzo(a)pyrene (0.499 mg/kg) above the RIDEM RDEC in the 0.75-2.75 foot sample.

B17-45

Five soil samples were submitted for analysis of VOCs, SVOCs, TPH, metals, and PCBs. The laboratory identified the following exceedances of RIDEM standards:

- Lead: 678 mg/kg in the 8-12 foot sample and 898 mg/kg in the 12-14 foot sample;
- Pyrene: 18.1 mg/kg in the 4-8 foot sample;
- Benzo [a] Anthracene: 9.48 mg/kg in the 4-8 foot sample, 1.21 mg/kg in the 8-12 foot sample, and 0.958 in the 12-14 foot sample;
- Chrysene: 7.56 mg/kg in the 4-8 foot sample, 1.01 mg/kg in the 8-12 foot sample, and 0.733 in the 12-14 foot sample;
- Benzo [b] Fluoranthene: 8.51 mg/kg in the 4-8 foot sample and 0.941 mg/kg in the 8-12 foot sample;
- Benzo [k] Fluoranthene: 3.99 mg/kg in the 4-8 foot sample
- Benzo [a] Pyrene: 7.98 mg/kg in the 4-8 foot sample, 1.18 mg/kg in the 8-12 foot sample, and 0.944 in the 12-14 foot sample;
- Fluoranthene: 21.4 mg/kg in the 4-8 foot sample;
- Dibenzo(a,h)anthracene: 2.70 mg/kg in the 4-8 foot sample;
- Indeno [1,2,3-cd] Pyrene: 4.75 mg/kg in the 4-8 foot sample; and
- Benzo [g,h,i] Perylene: 5.13 mg/kg in the 4-8 foot sample.

B17-46

Five soil samples were submitted for analysis of VOCs, SVOCs, TPH, metals, and PCBs. The laboratory identified the following exceedances of RIDEM standards:

- Pyrene: 21.6 mg/kg in the 6-8 foot sample;
- Benzo [a] Anthracene: 9.38 mg/kg in the 6-8 foot sample, 1.05 mg/kg in the 8-10 foot sample, and 2.0 mg/kg in the 10-11.5 foot sample;
- Chrysene: 0.637 mg/kg in the 4-6 foot sample, 7.83 mg/kg in the 6-8 foot sample, 0.913 mg/kg in the 8-10 foot sample, and 1.70 in the 10-11.5 foot sample;
- Benzo [b] Fluoranthene: 7.30 mg/kg in the 6-8 foot sample and 1.32 in the 10-11.5 foot sample;
- Benzo [k] Fluoranthene: 5.77 mg/kg in the 6-8 foot sample and 1.21 mg/kg in the 10-11.5 foot sample;
- Benzo [a] Pyrene: 0.663 mg/kg in the 4-6 foot sample, 8.58 mg/kg in the 6-8 foot sample, 0.904 mg/kg in the 8-10 foot sample, and 1.64 in the 10-11.5 foot sample;
- Fluoranthene: 24.0 mg/kg in the 6-8 foot sample;
- Dibenzo(a,h)anthracene: 2.29 mg/kg in the 6-8 foot sample;
- Indeno [1,2,3-cd] Pyrene: 4.52 mg/kg in the 6-8 foot sample; and
- Benzo [g,h,i] Perylene: 4.81 mg/kg in the 6-8 foot sample and 0.872 mg/kg in the 10-11.5 foot sample.

B17-46A

Five soil samples were submitted for analysis of VOCs, SVOCs, TPH, metals, and PCBs. The laboratory identified the following exceedances of RIDEM standards:

- Lead: 794 mg/kg in the 13-15 foot sample;
- Benzo [a] Anthracene: 1.13 mg/kg in the 1.5-3 foot sample, 1.46 mg/kg in the 5-7 foot sample;
- Chrysene: 0.992 mg/kg in the 1.5-3 foot sample, 1.12 mg/kg in the 5-7 foot sample;
- Benzo [b] Fluoranthene: 0.978 in the 5-7 foot sample;
- Benzo [k] Fluoranthene: 1.03 mg/kg in the 5-7 foot sample; and
- Benzo [a] Pyrene: 0.969 mg/kg in the 1.5-3 foot sample, 1.24 mg/kg in the 5-7 foot sample, ;

3.0 Soil Borings

In August and September 2019 and February 2020, BETA oversaw the advancement of soil borings at the Site. The following details the advancement of these borings and the sampling of soil at the Site.

3.1 Preparation

Prior to initiating investigatory activities at the Site, BETA performed the following activities in preparation of the implementation of the field work for this investigation:

- Marked out the proposed boring locations in the field for utility locations purposes;
- More than 72 hours prior to the start of the drilling activities, notified "Digsafe" and the City of Pawtucket to mark utilities in the vicinity of the proposed boring locations;
- Reviewed Site plans and attempted to locate borings away from on-site utility lines; and,
- Prepared a project-specific Health and Safety Plan (HASP) prior to the commencement of field work (see Appendix D).

3.2 Soil Borings

BETA oversaw the advancement of fourteen (14) soil borings in August and September 2019 and February 2020 (see below for a description of boring locations). Drilling activities were completed by Geologic Earth Exploration (Geologic) of Norfolk, Massachusetts using a track-mounted drill rig. McMillen Jacobs Associates (McMillen) of Burlington, Massachusetts conducted geotechnical soil sampling, rock core sampling, and provided the boring and monitoring well logs (Appendix E). Soil samples were collected during drilling operations using split spoons at each boring location with samples collected continuously from grade for the first ten feet and then at five-foot intervals below ten feet. The boreholes were cleared to six feet below grade via vacuum extraction to avoid any potential risk to subsurface utilities. Soil boring locations are depicted on the Plan Set sheets included in the figures appendix and are described as follows:

- B-1: Contract IIIA-5, Station 16+70, on the eastern edge of the Tidewater property near the chain link fence gate.
- B-2: In the center of the Tidewater property along Tidewater Street. Please note that this boring does not appear on the Plan Set sheets as it was located along the original alignment that bisected the Tidewater property.
- B-3: Contract IIIA-5, Station 6+87, on the western edge of the Tidewater property along Taft Street.
- B-4: Contract IIIA-4, Station 0+93 (S), along Roosevelt Avenue Extension across from the building located at 50 Pleasant Street.
- B-5: Contract IIIA-4, Station 2+31, along Roosevelt Avenue Extension at the intersection with Jenks Way.
- B-6: Contract IIIA-4, Station 2+45, along Roosevelt Avenue Extension across from the building located at 92 East Ave.

- B-6A: Contract IIIA-4, Station 3+45, along Roosevelt Avenue Extension approximately 100 feet south of boring B-6.
- B-7: Contract IIIA-4, Station 6+06, along Roosevelt Avenue Extension near the National Grid generating station.
- B-8: Contract IIIA-4, Station 9+42, along Roosevelt Avenue Extension southwest of the intersection with Main Street.
- B-9: Contract IIIA-5, Station 9+86, on the western edge of the Tidewater property along Taft Street.
- B-10: Contract IIIA-5, Station 14+03, in the center of the Tidewater property along Tidewater Street.
- B-11: Contract IIIA-5, Station 11+87, in the center of the Tidewater property along Tidewater Street.
- B-12: Contract IIIA-5, Station 8+39, on the western edge of the Tidewater property along Taft Street.
- B-13: On the northeastern edge of the Tidewater property near the chain link fence.

BETA field screened soil samples from the upper ten feet from borings B-4 through B-8 for the presence of total volatile organic compounds (TVOCs) using a photoionization detector (PID) calibrated to measure TVOCs in parts per million by volume (ppm_v). McMillan Jacobs field screened soil samples at various depths from each of the borings. BETA's headspace readings for samples from B-4 through B-8 ranged from 0.0 ppm_v to 6.0 ppm_v. McMillan Jacobs identified several soil samples from the borings on the Tidewater property with headspace readings from 20 ppm_v to >100 ppm_v. Table 1 summarizes BETA and McMillan Jacobs PID readings for samples from the soil borings.

BETA collected soil samples from the 0-2 foot, 2-4 foot, 4-6 foot, and 6-10 foot intervals from each split spoon collected during the first ten feet of borings B-4, B-5, B-6A, B-7, and B-8. BETA also collected 0-2 foot and 2-4 foot samples from boring B-6 which hit refusal at 4 feet. These samples were submitted to ESS Laboratory (ESS) of Cranston, Rhode Island for analysis of thirteen priority pollutant metals (PP-13) by EPA Method 6010B, total petroleum hydrocarbons (TPH) by EPA Method 8100M, volatile organic compounds (VOCs) by EPA Method 8260B, semi-volatile organic compounds (SVOCs) by EPA Method 8270D, and polychlorinated biphenyls (PCBs) by EPA Method 8082A. Table 2 summarizes the detected compounds from these analyses and Appendix F contains the laboratory certificates of analysis. Environmental samples were not collected from the borings (B-1, B-2, B-3, B-9, B-10, B-11, B-12, and B-13) advanced on the Tidewater property.

In addition, geotechnical soil samples collected by McMillen were submitted to Geocomp of Acton, Massachusetts for soil classification and assessment of engineering properties. Rock cores were obtained from boreholes in continuous 5-ft lengths when refusal was encountered. The core samples were retained in wooden core boxes and field measured for recovery (inches and percentage) and rock quality designation (inches and percentage) before submission to Geocomp by McMillen. Results from Geocomp's analyses are included in the Geotechnical Data Report

3.3 Soil Analytical Data

Table 2 provides a summary of the analytical data with comparison to RIDEM's RDEC and I/CDEC standards. The following lists exceedances of the RIDEM RDEC which is listed in parentheses after each compound.

- Benzo(a)anthracene (0.9 mg/kg) in the samples from B-5 4-6 feet (2.29 mg/kg) and B-7 6-10 feet (1.83 mg/kg);
- Benzo(a)pyrene (0.4 mg/kg) in the samples from B-4 2-4 feet (0.665 mg/kg), B-5 4-6 feet (1.98 mg/kg), B-7 6-10 feet (1.70 mg/kg), and B-8 6-10 feet (0.559 mg/kg);
- Benzo(b)fluoranthene (0.9 mg/kg) in the samples from B-5 4-6 feet (1.40 mg/kg) and B-7 6-10 feet (1.49 mg/kg);
- Benzo(g,h,i)perylene (0.8 mg/kg) in the samples from B-5 4-6 feet (1.11 mg/kg) and B-7 6-10 feet (0.847 mg/kg);
- Benzo(k)fluoranthene (0.9 mg/kg) in the samples from B-5 4-6 feet (2.07 mg/kg) and B-7 6-10 feet (1.58 mg/kg);
- Chrysene (0.4 mg/kg) in the samples from B-4 2-4 feet (0.815 mg/kg), B-5 4-6 feet (2.04 mg/kg), B-7 2-4 feet (0.413 mg/kg), B-7 4-6 feet (0.485 mg/kg), B-7 6-10 feet (1.95 mg/kg), B-8 4-6 feet (0.453 mg/kg), and B-8 6-10 feet (0.616 mg/kg);
- Dibenzo(a,h)anthracene (0.4 mg/kg) in the sample from B-5 4-6 feet (0.510 mg/kg);
- Indeno(1,2,3-cd)pyrene (0.9 mg/kg) in the sample from B-5 4-6 feet (1.10 mg/kg);
- Total petroleum hydrocarbons (500 mg/kg) in the samples from B-4 0-2 feet (886 mg/kg), B-4 2-4 feet (1,370 mg/kg), B-4 4-6 feet (744 mg/kg), B-4 6-10 feet (543 mg/kg), B-5 4-6 feet (1,850 mg/kg), B-7 0-2 feet (973 mg/kg), B-7 2-4 feet (735 mg/kg), and B-7 4-6 feet (1.220 mg/kg);
- Arsenic (7 mg/kg) in the samples from B-4 6-10 feet (7.69 mg/kg), B-7 2-4 feet (9.20 mg/kg), B-7 4-6 feet (8.15 mg/kg), B-7 6-10 feet (52.5 mg/kg), B-8 0-2 feet (9.84 mg/kg), B-8 4-6 feet (16.8 mg/kg), and B-8 6-10 feet (12.4 mg/kg); and
- Lead (150 mg/kg) in the sample from B-7 6-10 feet (153 mg/kg).

In addition, benzo(a)pyrene was detected above the applicable industrial and commercial direct exposure criteria (ICDEC) (0.8 mg/kg) in the sample from B-7 6-10 feet. Arsenic was detected above the applicable ICDEC (7 mg/kg) in the samples from B-4 6-10 feet, B-7 2-4 feet, B-7 4-6 feet, B-7 6-10 feet, B-8 0-2 feet, B-8 4-6 feet, and B-8 6-10 feet.

4.0 GROUNDWATER

As part of this subsurface investigation, BETA oversaw the installation of six monitoring wells at the Site. The following details the installation of these wells at the Site.

4.1 MONITORING WELLS

During the advancement of the soil borings in August and September 2019 and February 2020, refusal was encountered on presumed bedrock at twelve of the thirteen borings (refusal was not encountered at boring B-7) at depths ranging from 10 to 29.5 feet below grade. BETA oversaw the installation of six monitoring wells: MW-2, MW-3, MW-4, MW-7, MW-9, and MW-10. These wells are depicted on the Plan Set sheets included in the figures appendix. Please note that each well was installed in the correspondingly numbered boring (i.e., B-2 is the location of MW-2).

The depth of the six monitoring wells ranges from 15 to 26.5 feet below the ground surface. Each monitoring well was completed using 2-inch schedule 40 PVC material. At each monitoring well ten feet of 0.010-inch slotted screen, an appropriate length of riser material, sand and bentonite were used to complete the well. The wells were completed with either a flush-mounted roadbox or standpipe and cemented in place. Soil boring logs are included as Appendix D. Monitoring well and soil boring locations are depicted on the Plan Set sheets included in the figures appendix.

4.2 GROUNDWATER MONITORING WELL DEVELOPMENT

Following boring completion and well installation Geologic personnel developed monitoring wells MW-2, MW-3, MW-4, MW-7, MW-9, and MW-10. In accordance with state and federal protocols, the monitoring wells were developed to remove fine silt and sand from the well and to ensure a proper connection between the well and the surrounding aquifer prior to the collection of groundwater samples. Geologic used the overpumping method to develop the wells. Water collected during the development of the monitoring wells located on the Tidewater property (MW-2, MW-3, MW-9, and MW-10) was containerized in 55-gallon drums by Geologic for disposal by National Grid.

4.3 GROUNDWATER CLASSIFICATION

RIDEM classifies groundwater within the project area as GB. Groundwater classified GB is known or presumed to be unsuitable for drinking water use without treatment. In Section 4.4, BETA has compared groundwater results to RIDEM's GB Objectives.

4.4 GROUNDWATER SAMPLING

On March 12, 2020, the depth to groundwater was gauged in monitoring wells MW-4 and MW-7 and samples were collected from each well. The four wells on the Tidewater property were not sampled; however, groundwater on that property is known to be contaminated. EPA's low-flow sampling method was used to collect the groundwater sample from each monitoring well. Appendix G contains sampling logs for the wells.

BETA submitted these groundwater samples to ESS for analysis of the PP-13 metals by EPA Method 6010B, TPH by EPA Method 8100M, VOCs by EPA Method 8260B, SVOCs by EPA Method 8270D, and PCBs by EPA Method 8082A. Table 3 summarizes the detected compounds from these analyses and Appendix H contains the laboratory certificates of analysis.

4.5 Groundwater Analytical Data

As can be seen in Table 3, none of the concentrations of the detected compounds exceeded the applicable RIDEM GB Objectives. As dewatering effluent will likely be discharged to the NBC's sewer system, Table 3 also includes NBC's Bucklin Point Effluent Discharge Limitations. As can be seen in Table 3, none of the concentrations of the detected compounds exceeded the discharge limitations.

Please note; however, that groundwater at Tidewater likely contains higher concentrations of contaminants than those detected in the sampled wells. As such, dewatering effluent may require pre-treatment prior to discharge into the NBC's sewer system. The Basis of Design report and the technical specifications and contract documents will address the need for pre-treatment.

4.6 Hydrogeology

Coincident to the August and September 2019 field work, Bryant Associates, Inc. (Bryant) of Lincoln, Rhode Island conducted an elevation and location survey, consistent with the State Plane Coordinate System and NAVD88 vertical datum. McMillan Jacobs measured water levels in September 2019 and February 2020. BETA measured groundwater elevations in the recently installed monitoring wells during the March 2020 field work. Table 4 and the well logs in Appendix G include groundwater measurements and elevations.

5.0 Project Monitoring

During the work conducted on the Tidewater property and in accordance with National Grid's Health and Safety requirements, BETA coordinated access control to the work areas utilizing the following control boundaries:

- Work Zone: A 20-foot circumference around the drilling location treated as the exclusion zone;
- Work Zone Perimeter: A 50-foot circumference around the drilling location, all equipment was decontaminated in this zone before being transferred to the support zone; and,
- Support Zone: The area located outside the work zone perimeter;

BETA personnel were allowed to enter the work zone perimeter when equipped with a photoionization detector (PID) and DustTrack dust monitor to monitor air quality within the work zone. The PID and dust monitor were run continuously (with data logging enabled) within the work zone with readings collected at the work zone perimeter every two hours. Logged data was provided to National Grid daily.

Due to heavy rains encountered during the February 2020 site work the PID used for air monitoring became routinely saturated with moisture, resulting in skewed readings that were observed to have no relationship to proximity to the work zone or the work being conducted. Attempts were made to mitigate this problem such as the use of 45 mm/0.45 mm external filters, supplemental readings from other PIDs protected from the weather, housing the PID itself under cover when possible, and frequent work stops to "dry out" the PID inside BETA personnel's vehicles. These complications and the steps taken to address them were communicated to National Grid daily.

6.0 CONCLUSIONS

Based on the investigatory activities conducted in support of the Narragansett Bay Commission (NBC) Phase III Combined Sewer Overflow (CSO) Consolidation Conduits IIIA-4 and IIIA-5 project, BETA makes the following conclusions:

- Although soil and groundwater sampling were not allowed on the Tidewater property, review of GZA's report for the site indicate the presence of lead, arsenic, TPH, cyanide, PCBs, and SVOCs in soil and VOCs, TPH, arsenic, and cyanide in groundwater near the proposed work areas above RIDEM's RDECs. The concentrations of lead could result in some soil being classified as hazardous waste. Soil and groundwater management requirements on the Tidewater Property will be dictated by National Grid.
- Within the RIDOT I-95 remedial area on Taft Street, contaminated soil will likely be encountered. Work in this area will need to adhere to the provisions of the draft ELUR and SMP that has been prepared for this area but has not yet been filed with RIDEM.
- Laboratory analysis of soil samples identified concentrations of lead, arsenic, TPH, and SVOCs above the applicable RIDEM RDECs in four of the six boring locations along Taft Street and Roosevelt Avenue Extension (B-4, B-5, B-7, and B-8).
- In addition, benzo(a)pyrene was identified in concentrations in excess of the applicable RIDEM ICDEC (0.8 mg/kg) in samples B-5 4-6 ft (1.98 mg/kg) and B-7 6-10 ft (1.70 mg/kg). Arsenic was identified in concentrations in excess of the applicable RIDEM ICDEC (7 mg/kg) in samples B-4 6-10 ft (7.69 mg/kg), B-7 2-4 ft (9.20 mg/kg), B-7 4-6 ft (8.15 mg/kg), B-7 6-10 ft (52.5 mg/kg), B-8 0-2 ft (9.94 mg/kg), B-8 4-6 ft (16.8 mg/kg), and B-8 6-10 ft (12.4 mg/kg).
- Laboratory analysis of BETA's groundwater samples did not identify exceedances of RIDEM's GB groundwater objectives or NBC's discharge limits for their Bucklin Point facility. Although wells were not sampled on the Tidewater property, groundwater in this area is known to be contaminated.
- Historic groundwater sampling at B17-8 (near the former Masonic Temple property) identified VOCs above RIDEM's GB groundwater objectives and NBC's discharge limits for their Bucklin Point facility. Additional groundwater monitoring wells are being installed on the former Masonic Temple by the Program Manager to determine the extent of contamination in this area.

TABLES

Table 1 - Field Screening Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	**B-4**	**B-5**	**B-6**	**B-6A**	**B-7**	**B-8**
Sample Date	**08/28/2019**	**08/27/2019**	**08/29/2019**	**9/18/2019**	**08/30/2019**	**09/03/2019**
Total Volatile Organic Compounds (ppmv)						
0-2'	0.2	0.0	0.2	0.1	0.0	0.1
2-4'	6.0	0.1	0.0	0.3	0.0	0.0
4-6'	0.1	0.0	*	0.0	0.0	0.0
6-10'	0.0	0.0	*	0.0	0.0	0.0

* - Boring abandoned and relocated after unforseen concrete obstruction encountered at 4'
Field screening performed using the headspace method via MiniRAE2000 equipped with a 10.6 eV lamp

Table 2 - Soil Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	B-4 0-2ft	B-4 2-4ft	B-4 4-6ft	B-4 6-10ft	B-5 0-2ft	B-5 2-4ft	B-5 4-6ft	B-5 6-10ft	B-6 0-2ft	B-6 2-4ft	B-6A 0-2ft	B-6A 2-4ft	B-6A 4-6ft	B-6A 6-10ft	B-7 0-2ft	B-7 2-4ft	B-7 4-6ft	B-7 6-10ft	B-8 0-2ft	B-8 2-4ft	B-8 4-6ft	B-8 6-10ft	RIDEM	RIDEM
Sample Date	**08/28/2019**	**08/28/2019**	**08/28/2019**	**08/28/2019**	**08/27/2019**	**08/27/2019**	**08/27/2019**	**08/27/2019**	**08/29/2019**	**08/29/2019**	**9/18/2019**	**9/18/2019**	**9/18/2019**	**9/18/2019**	**08/30/2019**	**08/30/2019**	**08/30/2019**	**08/30/2019**	**09/03/2019**	**09/03/2019**	**9/10/2019**	**9/10/2019**	**ResDEC**	**ICDEC**
Volatile Organic Compounds, mg/kg																								
Acetone	0.0331 U	0.0379 U	0.0449 U	0.028 U	0.0347 U	0.0354 U	0.044 U	0.0393 U	0.0386 U	**0.0513**	0.0359 U	0.0462 U	0.04 U	**0.0384** U	0.0395 U	**0.0472**	0.0582 U	0.0407 U	0.0409 U	0.0397 U	0.0369 U	0.0346 U	7,800	10,000
1,1-Dichloroethene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	0.0046 U	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	0.2	9.5
1,2-Dibromo-3-Chloropropane	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	0.0046 U	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	0.5	4.1
1,2-Dibromoethane	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	0.0046 U	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	0.01	0.07
Benzene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	**0.291**	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	2.5	200
Methylene Chloride	0.0166 U	0.0189 U	0.0225 U	0.014 U	0.0173 U	0.0177 U	0.022 U	0.0197 U	0.0193 U	0.0203 U	0.018 U	0.0231 U	0.02 U	0.0192 U	0.0198 U	**0.0733**	**0.0732**	0.0204 U	0.0205 U	0.0199 U	0.0185 U	0.0173 U	45	760
Tetrachloroethene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	**0.0560**	**0.0787**	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	12	110
Toluene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	**0.151**	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	190	10,000
Vinyl Chloride	0.0066 U	0.0076 U	0.009 U	0.0056 U	0.0069 U	0.0071 U	0.0088 U	0.0079 U	0.0077 U	0.0081 U	0.0072 U	0.0092 U	0.008 U	0.0077 U	0.0079 U	0.0092 U	0.0116 U	0.0081 U	0.0082 U	0.0079 U	0.0074 U	0.0069 U	0.02	3
Xylene P,M	0.0066 U	0.0076 U	0.009 U	0.0056 U	0.0069 U	0.0071 U	0.0088 U	0.0079 U	0.0077 U	0.0081 U	0.0072 U	0.0092 U	0.008 U	0.0077 U	0.0079 U	**0.0539**	0.0116 U	0.0081 U	0.0082 U	0.0079 U	0.0074 U	0.0069 U	110	10,000
Total VOCs	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.05**	ND	ND	ND	0.0384	ND	**0.67**	**0.15**	ND	ND	ND	ND	ND	NE	NE
Semi-Volatile Organic Compounds, mg/kg																								
Anthracene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**0.879**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	1.53 U	1.64 U	1.67 U	**0.523**	0.359 U	0.364 U	0.387 U	0.396 U	35	10,000
Benzo(a)anthracene	0.75 U	**0.800**	0.754 U	0.718 U	0.344 U	0.372 U	**2.29**	**0.388**	0.381 U	**0.370**	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**1.83**	0.359 U	0.364 U	0.387 U	**0.473**	0.9	7.8
Benzo(a)pyrene	0.376 U	**0.665**	0.378 U	0.36 U	0.173 U	0.187 U	**1.98**	**0.300**	**0.250**	**0.331**	0.189 U	0.178 U	0.189 U	**0.261**	0.305 U	**0.399**	**0.394**	**1.70**	0.18 U	0.183 U	**0.385**	**0.559**	0.4	0.8
Benzo(b)fluoranthene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**1.40**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**1.49**	0.359 U	0.364 U	**0.481**	**0.625**	0.9	7.8
Benzo(g,h,i)perylene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**1.11**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.459 U	0.493 U	0.5 U	**0.847**	0.359 U	0.364 U	0.387 U	0.396 U	0.8	10,000
Benzo(k)fluoranthene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**2.07**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**1.58**	0.359 U	0.364 U	0.387 U	**0.523**	0.9	78
Chrysene	0.376 U	**0.815**	**0.398**	0.36 U	0.173 U	0.187 U	**2.04**	**0.324**	**0.230**	**0.337**	0.189 U	0.178 U	0.189 U	**0.262**	0.305 U	**0.413**	**0.485**	**1.95**	0.18 U	0.183 U	**0.453**	**0.616**	0.4	780
Dibenzo(a,h)Anthracene	0.376 U	0.36 U	0.378 U	0.36 U	0.173 U	0.187 U	**0.510**	0.178 U	0.191 U	0.185 U	0.189 U	0.178 U	0.189 U	0.184 U	0.305 U	0.328 U	0.333 U	**0.305**	0.18 U	0.183 U	0.194 U	0.198 U	0.4	0.8
Fluoranthene	0.75 U	**1.80**	0.754 U	0.718 U	0.344 U	0.372 U	**4.35**	**1.02**	**0.468**	**0.665**	0.376 U	0.354 U	0.377 U	**0.395**	1.53 U	1.64 U	1.67 U	**4.49**	0.359 U	0.364 U	**0.834**	**1.01**	20	10,000
Indeno(1,2,3-cd)Pyrene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**1.10**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**0.811**	0.359 U	0.364 U	0.387 U	0.396 U	0.9	7.8
Naphthalene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	0.383 U	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.382 U	0.41 U	0.417 U	**0.401**	0.359 U	0.364 U	0.387 U	0.396 U	54	10,000
Phenanthrene	0.75 U	**1.73**	0.754 U	0.718 U	0.344 U	0.372 U	**3.52**	**1.12**	0.381 U	**0.376**	0.376 U	0.354 U	0.377 U	0.366 U	1.53 U	1.64 U	1.67 U	**3.47**	0.359 U	0.364 U	0.387 U	0.396 U	40	10,000
Pyrene	0.75 U	**1.82**	**0.859**	0.718 U	0.344 U	0.372 U	**4.02**	**0.844**	**0.424**	**0.593**	0.376 U	0.354 U	0.377 U	**0.482**	1.53 U	1.64 U	1.67 U	**3.73**	0.359 U	0.364 U	**0.825**	**1.07**	13	10,000
Total SVOCs	ND	**7.6**	**1.3**	ND	ND	ND	**25.3**	**4.0**	**1.4**	**2.7**	ND	ND	ND	**1.4**	ND	0.8	0.9	**23.1**	ND	ND	**3.0**	**4.9**	NE	NE
Total Petroleum Hydrocarbons, mg/kg																								
Total Petroleum Hydrocarbons	**886**	**1,370**	**744**	**543**	**160**	**1,850**	**233**	**136**	**390**	**205**	41.5 U	**310**	40.6 U	**60.3**	**973**	**735**	**1,220**	**143**	41.8 U	38.8 U	**59.6**	**68.6**	500	2,500
Total Metals, mg/kg																								
Antimony	3.93 U	5.19 U	1.79 U	4.06 U	5.24 U	3.98 U	4.49 U	5.37 U	1.97 U	5.2 U	4.33 U	5.2 U	4.56 U	4.16 U	3.29 U	4.75 U	2.39 U	**5.24**	3.69 U	3.93 U	4.96 U	4.91 U	10	820
Arsenic	1.97 U	**5.74**	**5.60**	**7.69**	2.62 U	**3.16**	**4.79**	**5.09**	**4.89**	**6.57**	2.16 U	2.6 U	**5.11**	**3.49**	**3.82**	**9.20**	**8.15**	**52.5**	**9.94**	**6.88**	**16.8**	**12.4**	7	7
Beryllium	**0.33**	**0.27**	**0.31**	**0.28**	**0.73**	**0.40**	**0.32**	**0.67**	**0.28**	**0.32**	**0.29**	**0.33**	**0.25**	**0.23**	**0.37**	**0.30**	**0.41**	0.05 U	**0.25**	**0.21**	**0.33**	**0.35**	1.5	1.5
Cadmium	0.39 U	0.52 U	0.18 U	0.41 U	0.52 U	0.4 U	0.45 U	0.54 U	0.2 U	0.52 U	0.43 U	0.52 U	0.46 U	0.42 U	0.33 U	0.47 U	0.24 U	2.46 U	0.37 U	0.39 U	0.5 U	0.49 U	39	1,000
Chromium	**9.53**	**12.8**	**12.1**	**15.6**	**12.1**	**14.0**	**11.5**	**20.1**	**8.99**	**10.8**	**4.25**	**7.43**	**6.59**	**7.88**	**4.95**	**9.32**	**9.59**	**17.2**	**7.00**	**7.48**	**14.3**	**14.1**	1,400	10,000
Copper	**10.4**	**22.2**	**24.7**	**17.7**	**11.4**	**14.3**	**23.8**	**14.4**	**25.5**	**25.7**	**6**	**8.64**	**10.6**	**18.8**	**7.56**	**23.1**	**20.7**	**327**	**6.78**	**5.93**	**37.5**	**37.5**	3,100	10,000
Lead	**14.1**	**53.2**	**85.4**	**60.8**	**8.02**	**27.8**	**90.3**	**60.6**	**51.6**	**51.4**	**5.87**	**7.03**	**20.7**	**35.7**	**6.43**	**28.9**	**21.8**	**153**	**5.41**	**5.02**	**68.0**	**67.8**	150	500
Mercury	**0.023**	**0.105**	**0.250**	**0.158**	0.016 U	**0.033**	**0.215**	0.025 U	**0.102**	**0.191**	0.029 U	0.033 U	**0.04**	**0.223**	0.027 U	**0.157**	**0.092**	**0.177**	0.027 U	0.031 U	**0.068**	**0.074**	23	610
Nickel	**8.15**	**11.5**	**10.7**	**12.1**	**9.89**	**11.5**	**8.35**	**14.1**	**8.26**	**9.12**	**5.96**	**8.49**	**8.41**	**9.14**	**6.77**	**9.50**	**9.89**	**105**	**9.00**	**8.62**	**14.6**	**16.3**	1,000	10,000
Selenium	3.93 U	5.19 U	0.18 U	4.06 U	5.24 U	3.98 U	4.49 U	5.37 U	1.97 U	5.2 U	4.33 U	5.2 U	4.56 U	4.16 U	3.29 U	4.75 U	2.39 U	**0.72**	3.69 U	3.93 U	0.5 U	0.49 U	390	10,000
Silver	0.39 U	0.52 U	0.36 U	0.41 U	0.52 U	0.4 U	0.45 U	0.54 U	0.2 U	0.52 U	0.43 U	0.52 U	0.46 U	0.42 U	0.33 U	0.47 U	0.48 U	2.46 U	0.37 U	0.39 U	0.5 U	0.49 U	200	10,000
Thallium	0.39 U	0.52 U	0.18 U	0.41 U	0.52 U	0.4 U	4.49 U	0.54 U	0.2 U	0.52 U	4.33 U	5.2 U	4.56 U	4.16 U	0.33 U	4.75 U	0.24 U	0.25 U	0.37 U	0.39 U	0.5 U	0.49 U	5.5	140
Zinc	**24.5**	**43.9**	**66.8**	**54.8**	**30.3**	**41.8**	**68.9**	**45.9**	**44.4**	**48.1**	**33.5**	**37.2**	**29.9**	**31.3**	**25.2**	**41.4**	**37.1**	**106**	**24.6**	**27.1**	**87.9**	**79.3**	6,000	10,000
Toxicity Characteristic Leaching Procedure Metals, mg/L																								
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.054**	NA	NA	NA	NA	5 (EPA)	
Polychlorinated Biphenyls, mg/kg																								
Aroclor 1262	0.06 U	0.05 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	0.06 U	**0.1**	10	10
Aroclor 1260	0.06 U	0.05 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	**0.2**	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	0.06 U	0.05 U	10	10
PCBs, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.2**	ND	ND	ND	ND	ND	ND	ND	**0.1**	10	10

Notes
U - Analyte not detected above laboratory minimum detection limits
NE - Standard not established
NA - Not analyzed
ND - Not detected

Table 3 - Groundwater Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	**MW-4**		**MW-7**		**RIDEM GB Objective**	**NBC Discharge Limits**
Sample Date	**03/12/2020**		**03/12/2020**			
Volatile Organic Compounds, micrograms per liter (µg/L)						2,130 (Total Toxic Organics)
Chloroform	1	U	**2.1**		NE	
Trichloroethene	1	U	**1.6**		540	
Semi-volatile Organic Compounds, µg/L						
Benzo(b)fluoranthene	**0.5**		0.5	U	NE	
Polychlorinated Biphenyls (PCBs), µg/L						
PCBs	ND		ND		NE	
Total Petroleum Hydrocarbons (TPH), µg/L						
TPH	190	U	190	U	NE	125,000
Total Metals, µg/L						
Antimony	1	U	1	U	NE	NE
Arsenic	**3**		**2.7**		NE	200
Beryllium	0.5	U	0.5	U	NE	NE
Cadmium	2.5	U	2.5	U	NE	110
Chromium	**10.1**		10	U	NE	2,770
Copper	**13.4**		**14.2**		NE	1,200
Lead	10	U	**17.5**		NE	690
Mercury	0.2	U	0.2	U	NE	60
Nickel	25	U	25	U	NE	1,620
Selenium	25	U	25	U	NE	400
Silver	5	U	5	U	NE	400
Thallium	0.5	U	0.5	U	NE	NE
Zinc	25	U	**27.9**		NE	1,670

Notes
U - Analyte not detected above laboratory minimum detection limits
NE - Standard not established
ND - Not detected

Table 4 - Groundwater Measurements and Elevations
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Monitoring Well	MW-2		MW-3		MW-4		MW-7		MW-9		MW-10	
Reference Elevation	22.20		37.45		19.87		23.28		28.04		23.74	
Date of Measurement	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation
8/29/2019	Not installed		Not measured		18.50	1.37	Not installed		Not installed		Not installed	
8/30/2019					NM	NM	8.40	14.88				
9/4/2019	8.60	13.60			NM	NM	NM	NM				
9/9/2019	11.10	11.10			NM	NM	NM	NM				
9/12/2019	NM	NM			18.30	1.57	8.40	14.88				
9/18/2019	NM	NM			18.50	1.37	8.50	14.78				
2/4/2020	5.00	17.20			NM	NM	NM	NM				
2/10/2020	NM	NM			NM	NM	8.25	15.03	10.67	17.37	10.42	13.32
2/12/2019	NM	NM			18.50	1.37	NM	NM	NM	NM	NM	NM
3/12/2020	NM	NM			17.93	1.94	8.32	14.96	NM	NM	NM	NM

Notes
NM - Not measured on this date
All measurements in feet

FIGURES

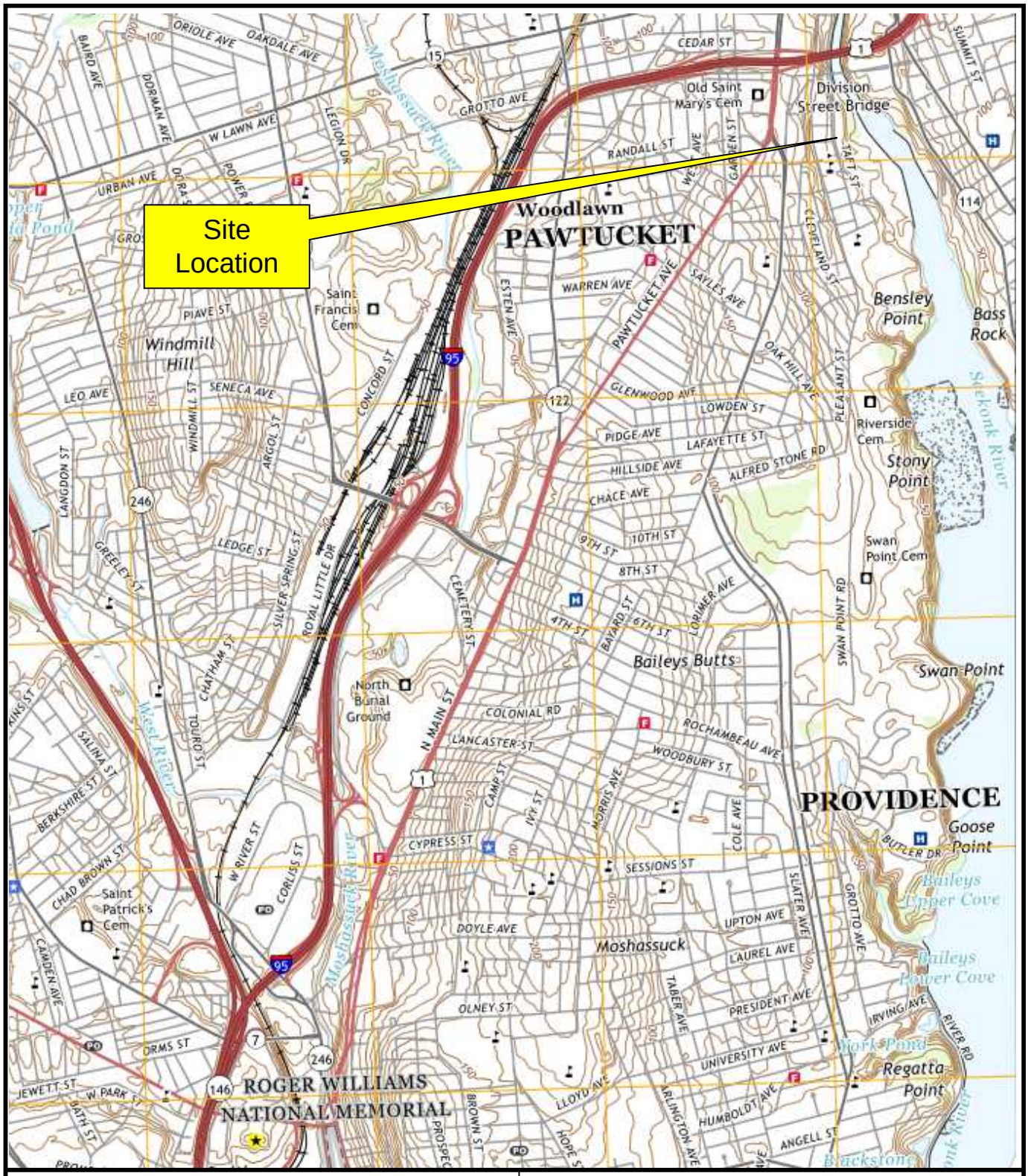
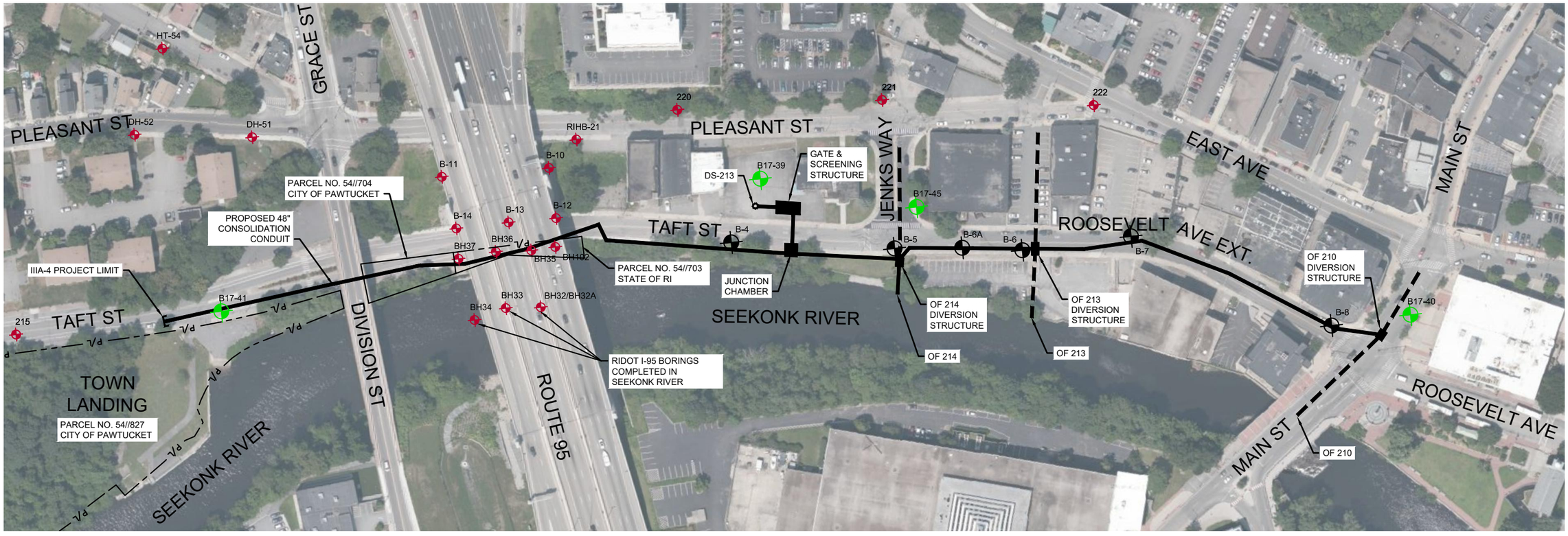


Figure 1: Site Locus

Drop Shaft 213 Consolidation Conduit & OF-217 Consolidation Conduit
Pawtucket, Rhode Island

BETA
www.BETA-Inc.com



LEGEND

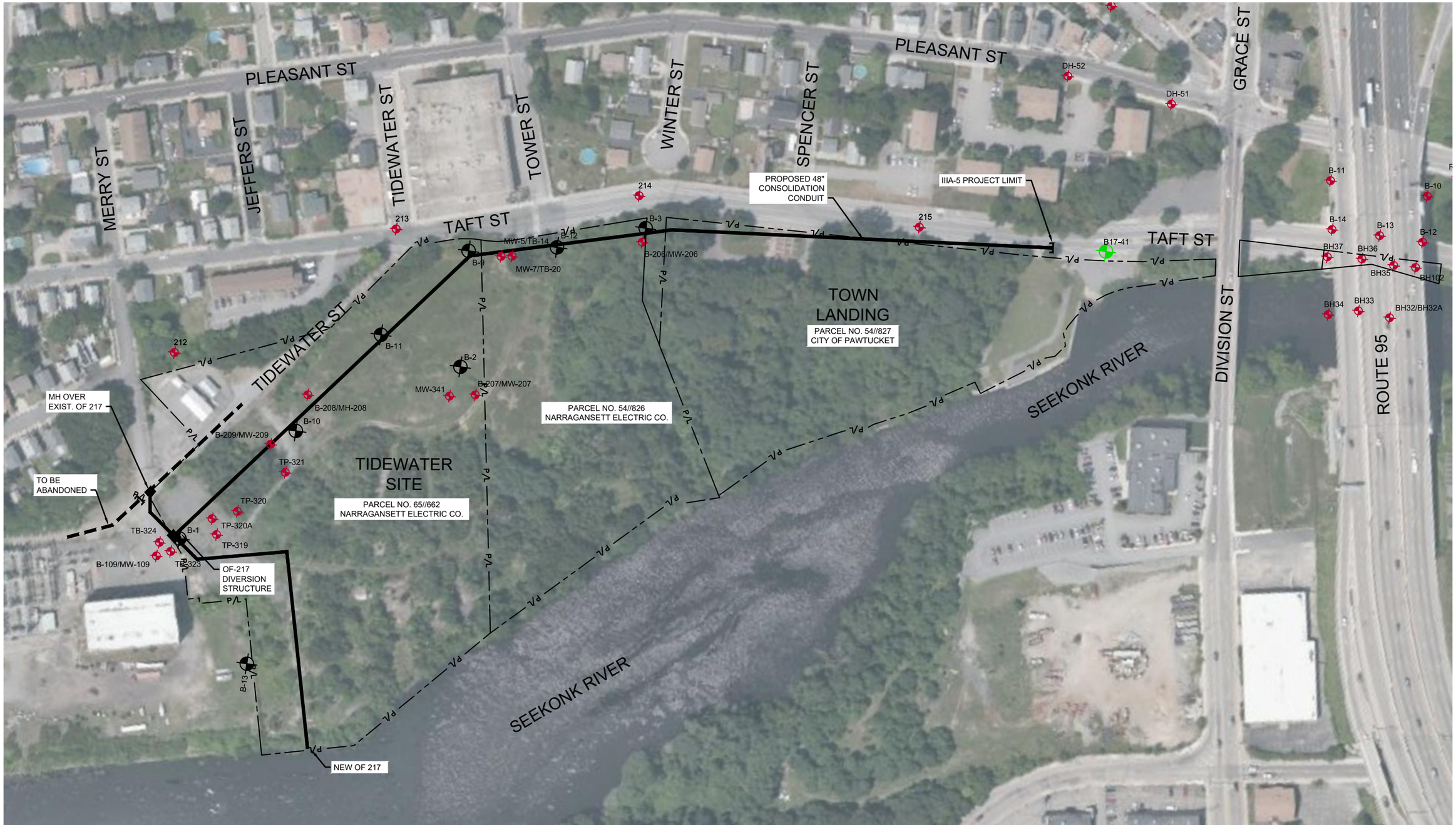
B-1 BORINGS COMPLETED FOR CONTRACT IIIA-4/IIIA-5

B17-45 BORINGS COMPLETED FOR CONTRACT IIIA-4/IIIA-5 BY PARE CORP.

BH-35 BORINGS PREVIOUSLY COMPLETED FOR OTHER PROJECTS

SCALE 1"=80'	NBC CONTRACT NO 308.XXC CIVIL IIIA-4 BASIS OF DESIGN	SHEET FIG. 2

DWG FILE: J:\6412 NBC CSO Consolidation Conduits\Drawing Files\Acad - Misc\PAWT_FIG_IIIA-4 & IIIA-5_GEOTECH_BORINGS.dwg PLOT DATE: Tuesday, May 1, 2018 11:18:00 AM BY: JAIMIE PAYNE

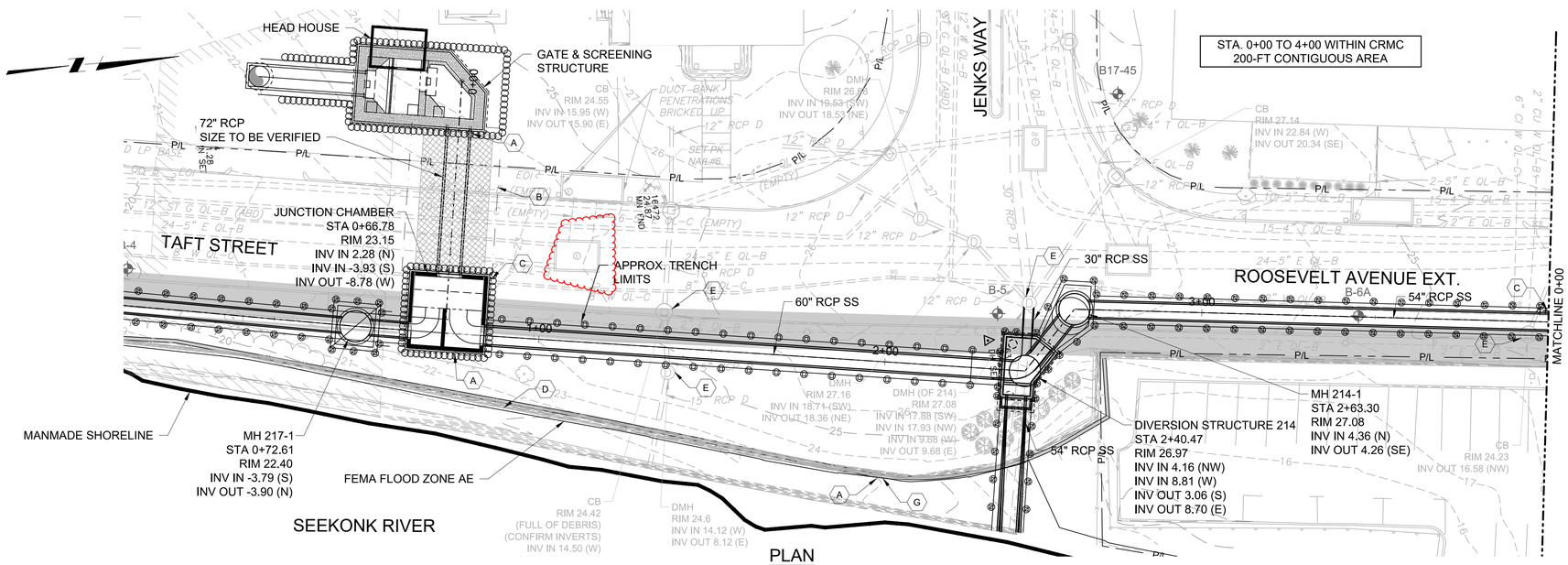


LEGEND

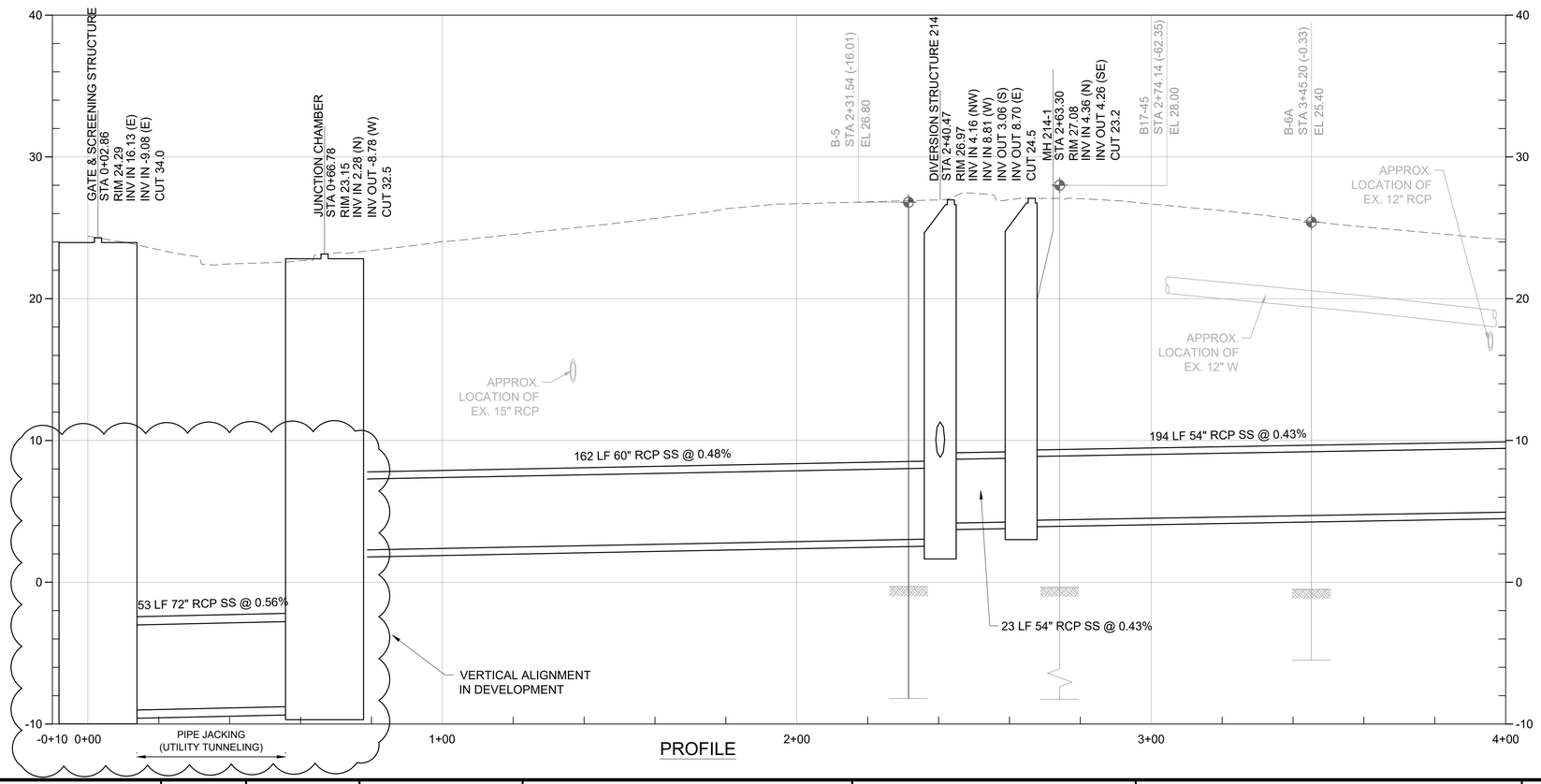
B-1	BORINGS COMPLETED FOR CONTRACT IIIA-4/IIIA-5
BH-35	BORINGS PREVIOUSLY COMPLETED FOR OTHER PROJECTS
B17-45	BORINGS COMPLETED FOR CONTRACT IIIA-4/IIIA-5 BY PARE CORP.

SCALE 1"=80'	NBC CONTRACT NO 308.XXC CIVIL IIIA-5 BASIS OF DESIGN	SHEET FIG. 3

DWG FILE: J:\6412 NBC CSO Consolidation Conduits\Drawing Files\Acad - Misc\PAWT_FIG_IIIA-4 & IIIA-5_GEOTECH_BORINGS.dwg PLOT DATE: Monday, February 24, 2020 9:48:59 AM BY: JAIMIE PAYNE



PLAN



PROFILE

KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0194J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BIRDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GRAY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. PIPE JACKING: STATION 0+00 TO STATION 0+73

B. AREA TO RECEIVE GROUND IMPROVEMENT - CHEMICAL INJECTION

C. REMOVE AND REPLACE WATER MAIN: STATION 0+73 TO STATION 4+00

D. RETAINING WALL STABILIZATION - GROUT INJECTION: STATION 0+66 TO STATION 2+00

E. REMOVE AND REPLACE DRAIN AND CATCH BASIN FOR INSTALLATION OF CONSOLIDATION CONDUIT: STATION 1+40 AND STATION 3+95

F. COORDINATE WITH CITY AND NATIONAL GRID TO ISOLATE AND REMOVE ELECTRIC LIGHT POLE: STATION 0+66

G. REMOVE AND REPLACE RETAINING WALL: STATION 0+66 TO STATION 0+90, STATION 2+00 TO STATION 4+50

REV	DATE	BY	DESCRIPTION

SCALE
H. SCALE 1"=20'
V. SCALE 1"=5'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA
www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

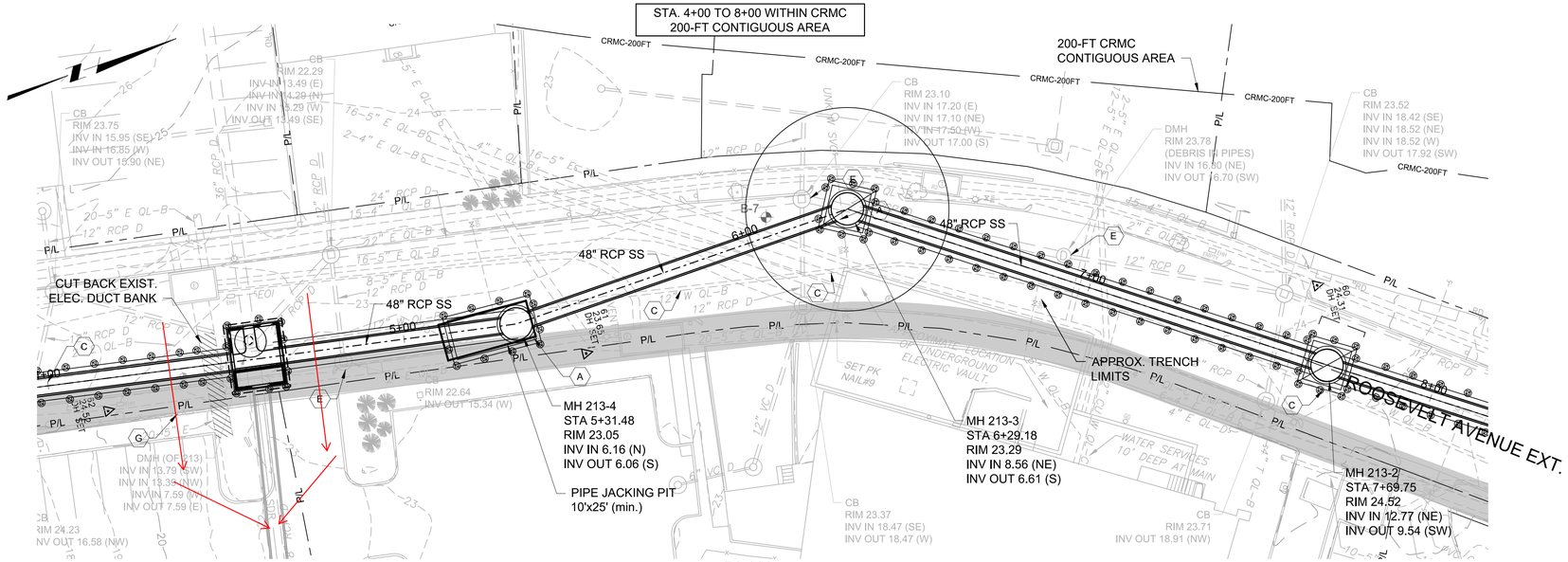
Stantec
PARE

NBC CONTRACT NO 308.XXC
CIVIL

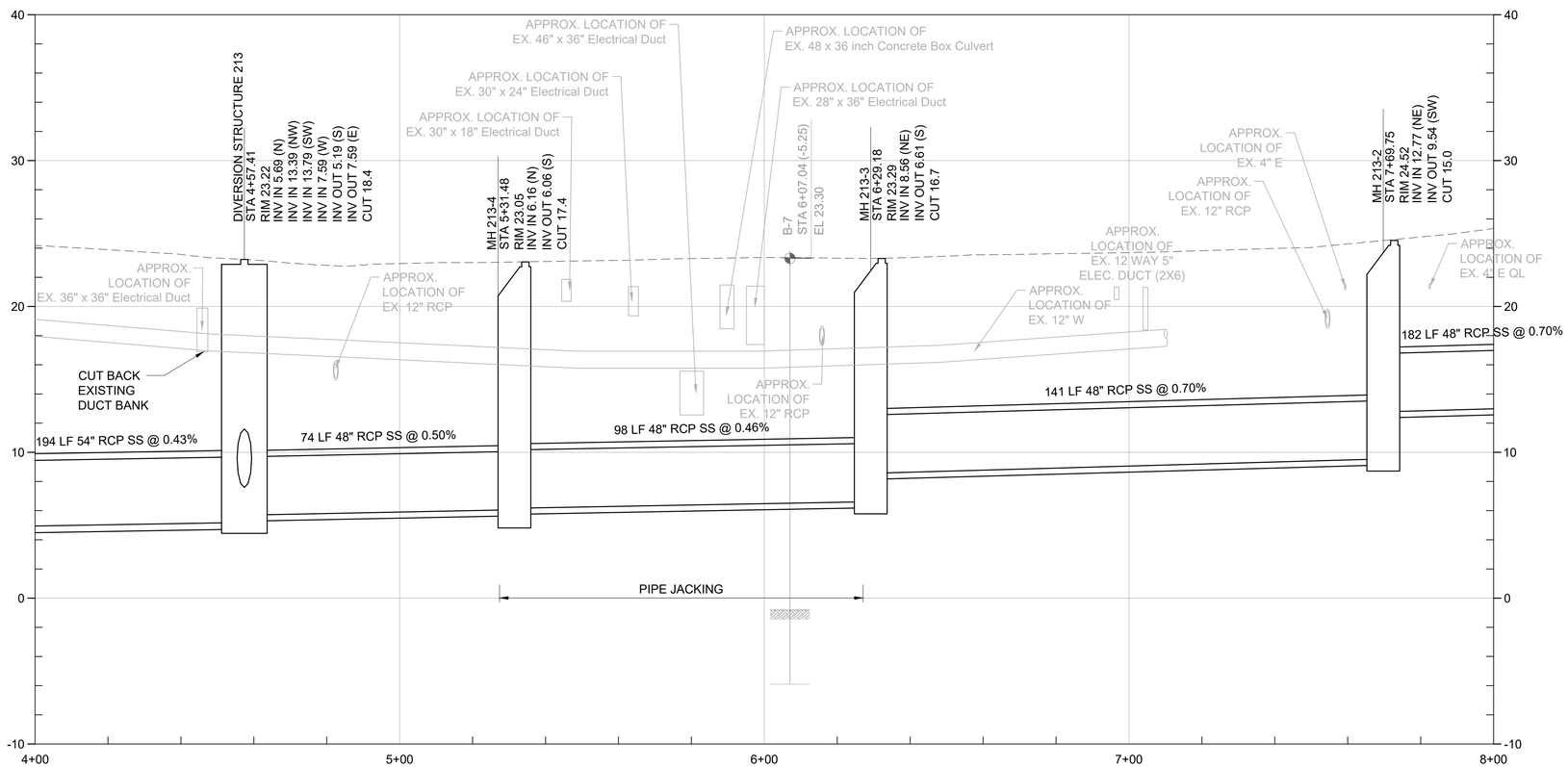
DROP SHAFT 213 CONSOLIDATION CONDUIT
PLAN AND PROFILE 1: STA 0+00 - 4+00

SHEET
C-5
195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-4.dwg
PLOT DATE: Friday, March 27, 2020 11:14:08 AM
BY: JAIMIE PAYNE

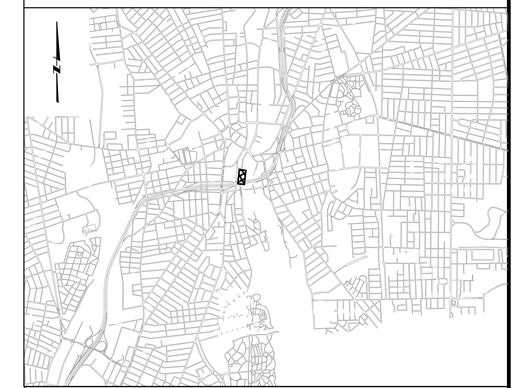


PLAN



PROFILE

KEY PLAN



GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0194J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BIRDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GRAY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. PIPE JACKING: STATION 5+31 TO STATION 6+22

B. AREA TO RECEIVE GROUND IMPROVEMENT - CHEMICAL INJECTION

C. REMOVE AND RELOCATE WATER MAIN: STATION 4+00 TO STATION 5+75, STATION 6+22 TO STATION 7+66

D. RETAINING WALL STABILIZATION - GROUT INJECTION: STATION 3+00 TO STATION 4+40

E. REMOVE AND REPLACE DRAIN AND CATCH BASIN FOR INSTALLATION OF CONSOLIDATION CONDUIT: STATION 4+30, STATION 6+15 TO STATION 6+90

F. COORDINATE WITH CITY AND NATIONAL GRID TO ISOLATE AND REMOVE ELECTRIC LIGHT POLE:

G. REMOVE AND REPLACE RETAINING WALL: STATION 4+00 TO STATION 4+35

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1"=20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN BMARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

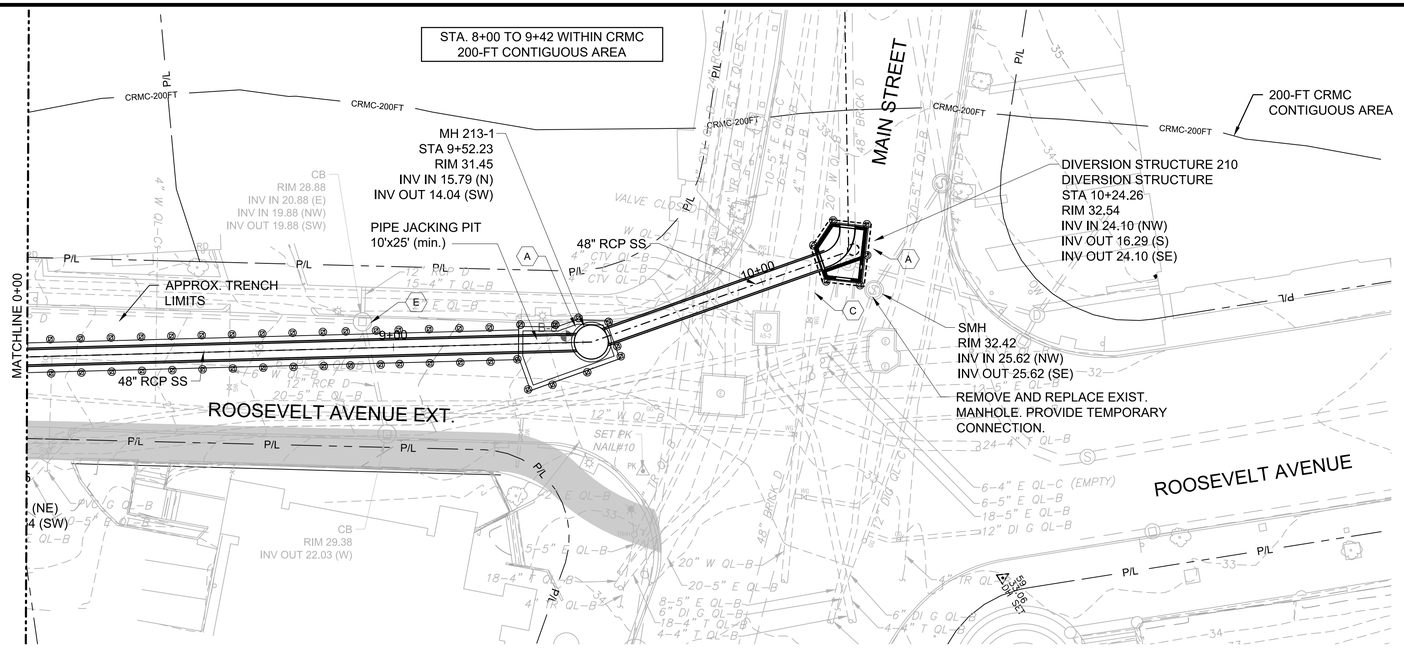
NBC CONTRACT NO 308.XXC
CIVIL

DROP SHAFT 213 CONSOLIDATION CONDUIT
PLAN AND PROFILE 2: STA 4+00 - 8+00

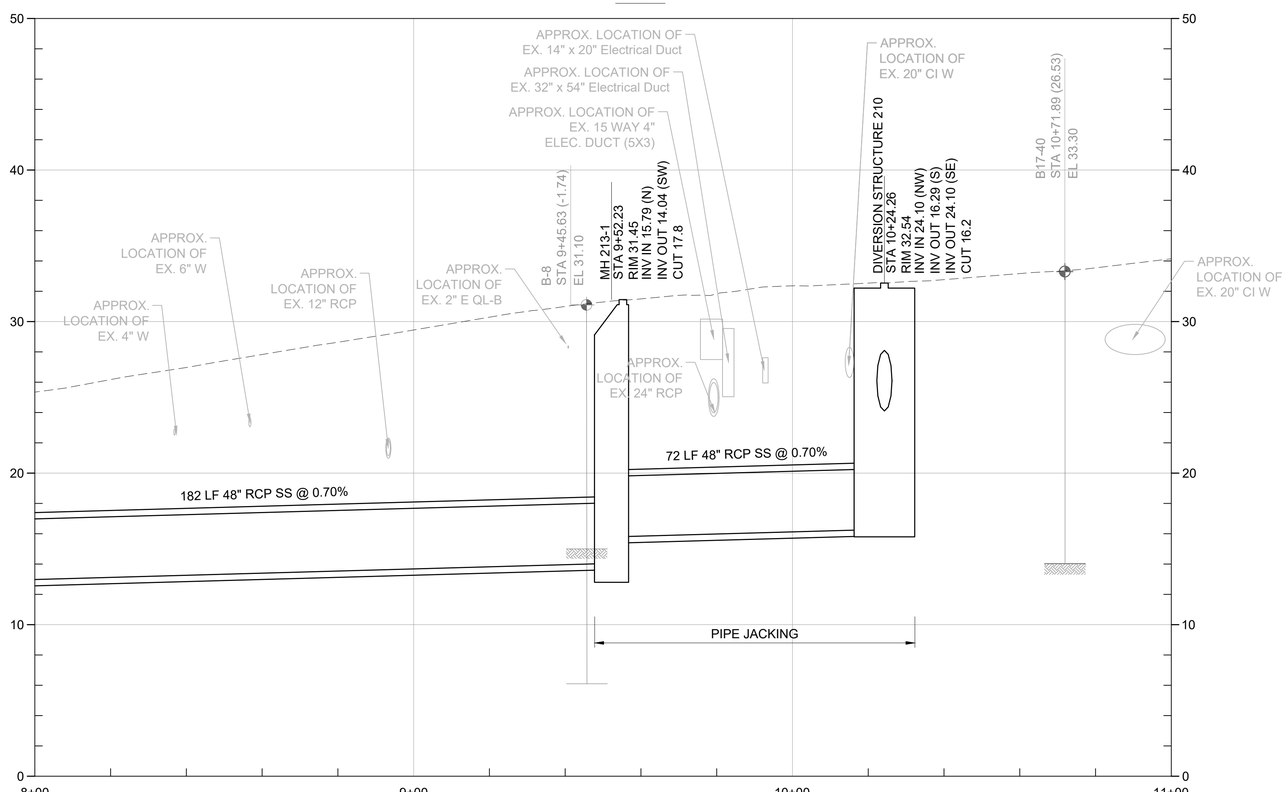
SHEET C-6

195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-4.dwg
PLOT DATE: Friday, March 27, 2020 11:14:41 AM
BY: JAIMIE PAYNE



PLAN



PROFILE

KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0194J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BIRDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GRAY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. PIPE JACKING: STATION 9+48 TO STATION 10+21

B. AREA TO RECEIVE GROUND IMPROVEMENTS - CHEMICAL INJECTION

C. RELOCATE WATER MAIN: STATION 10+10 (~25 LF)

D. RETAINING WALL STABILIZATION - GROUT INJECTION

E. REMOVE AND REPLACE DRAIN AND CATCH BASIN FOR INSTALLATION OF CONSOLIDATION CONDUIT: STATION 8+90

F. COORDINATE WITH CITY AND NATIONAL GRID TO ISOLATE AND REMOVE ELECTRIC LIGHT POLE:

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1"=20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED B.MARINI
DRAWN C.DIAS
CHECKED C.CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

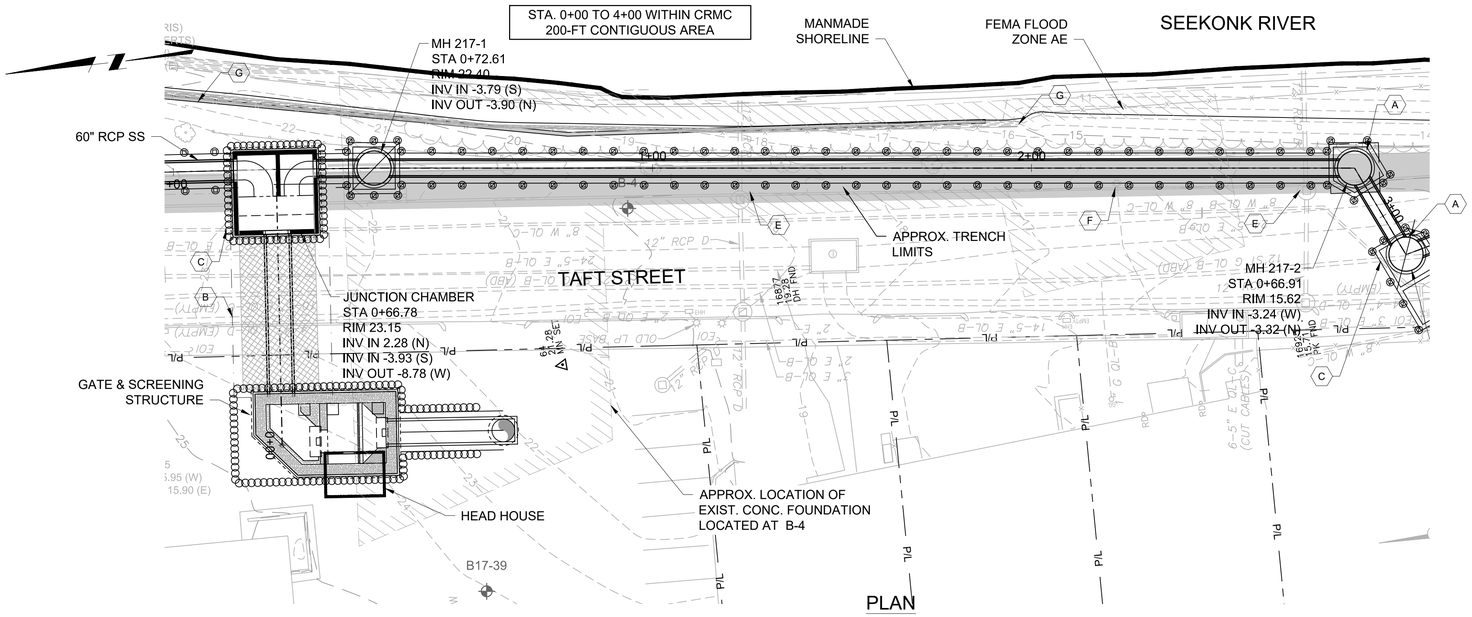
NBC CONTRACT NO 308.XXC
CIVIL

DROP SHAFT 213 CONSOLIDATION CONDUIT
PLAN AND PROFILE 3: STA 8+00 - 11+00

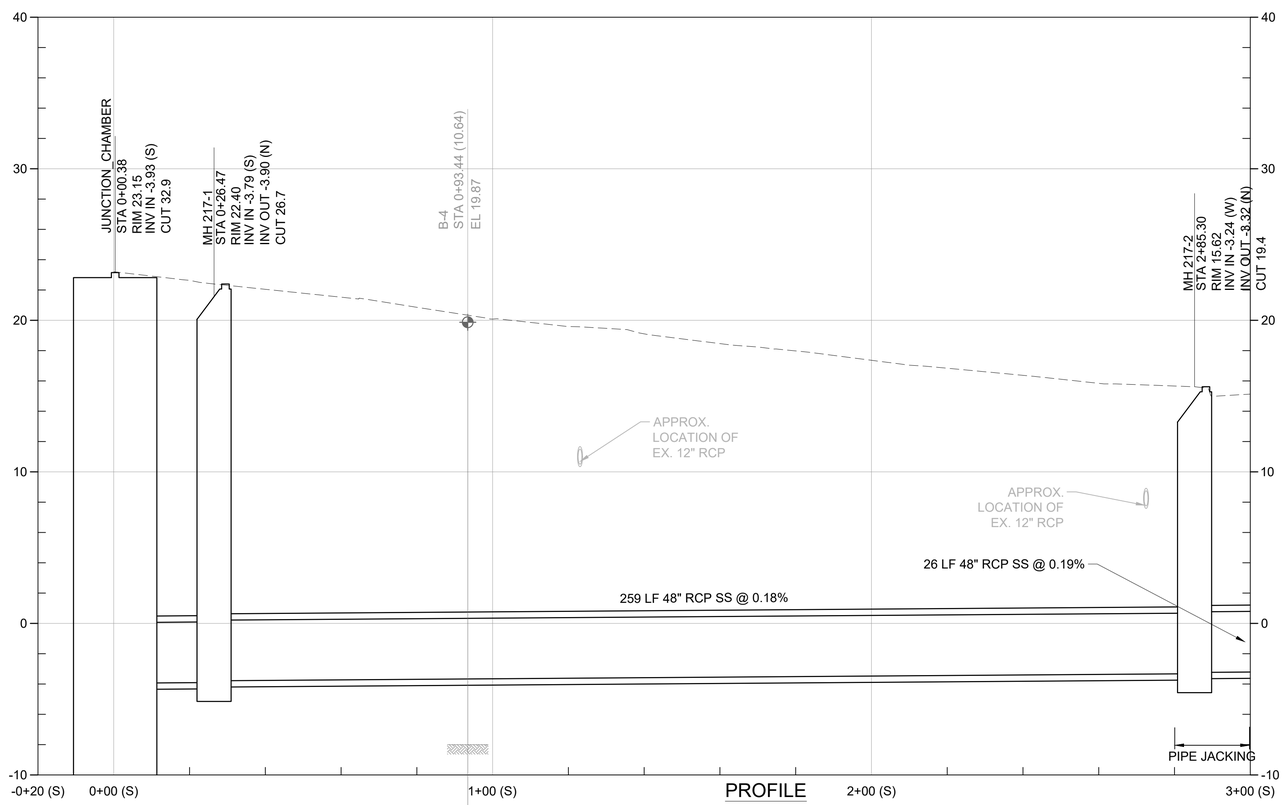
SHEET C-7

195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-4.dwg
PLOT DATE: Friday, March 27, 2020 11:15:13 AM
BY: JAIMIE PAYNE



PLAN



PROFILE

KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0194J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BIRDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GRAY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. PIPE JACKING: STATION 2+85 TO STATION 3+11
B. AREA TO RECEIVE GROUND IMPROVEMENT - CHEMICAL INJECTION
C. REMOVE AND REPLACE WATER MAIN: STATION 0+00 TO STATION 3+00
D. RETAINING WALL STABILIZATION - GROUT INJECTION
E. REMOVE AND REPLACE DRAIN AND CATCH BASIN FOR INSTALLATION OF CONSOLIDATION CONDUIT: STATION 1+22, STATION 2+70
F. COORDINATE WITH CITY AND NATIONAL GRID TO ISOLATE AND REMOVE ELECTRIC LIGHT POLE: STATION 2+22
G. REMOVE & REPLACE RETAINING WALL FROM STATION -0+20 TO STATION 1+96

REV	DATE	BY	DESCRIPTION

SCALE
H. SCALE 1"=20'
V. SCALE 1"=5'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B.MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA
www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

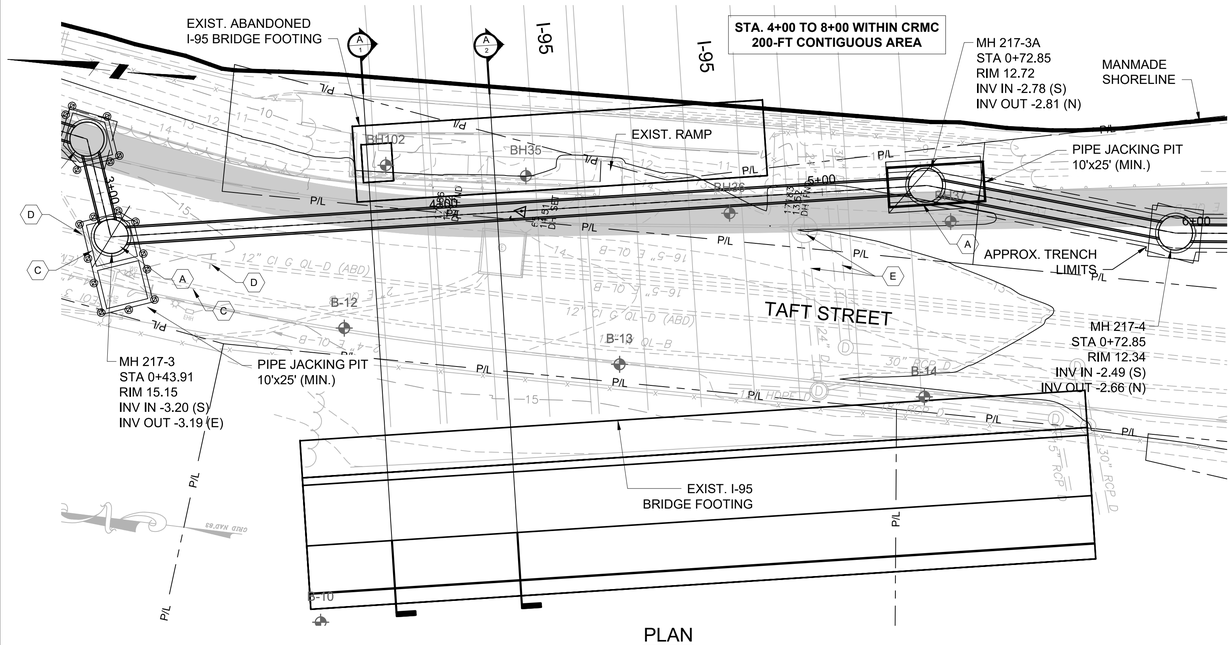
NBC CONTRACT NO 308.XXC
CIVIL

DROP SHAFT 213 CONSOLIDATION CONDUIT
PLAN AND PROFILE 4: STA 0+00 (S) - 4+00 (S)

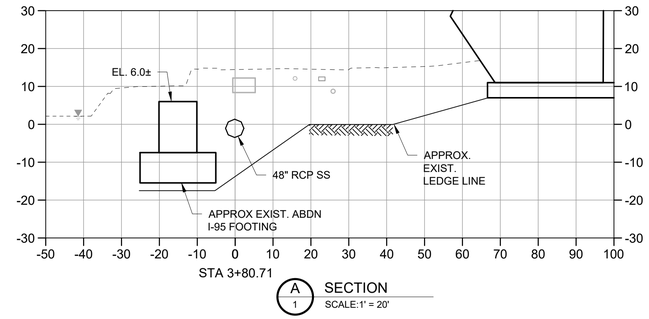
SHEET
C-8

195130165

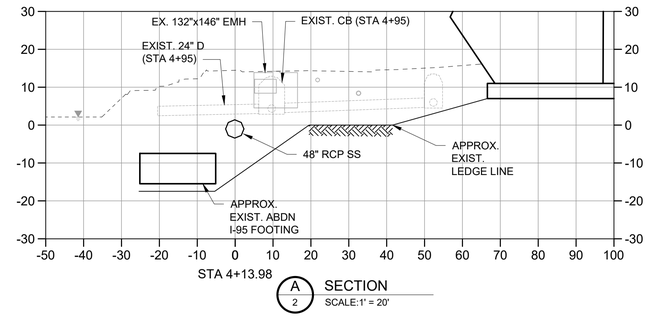
DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-4.dwg
PLOT DATE: Friday, March 27, 2020 11:15:46 AM
BY: JAMIE PAYNE



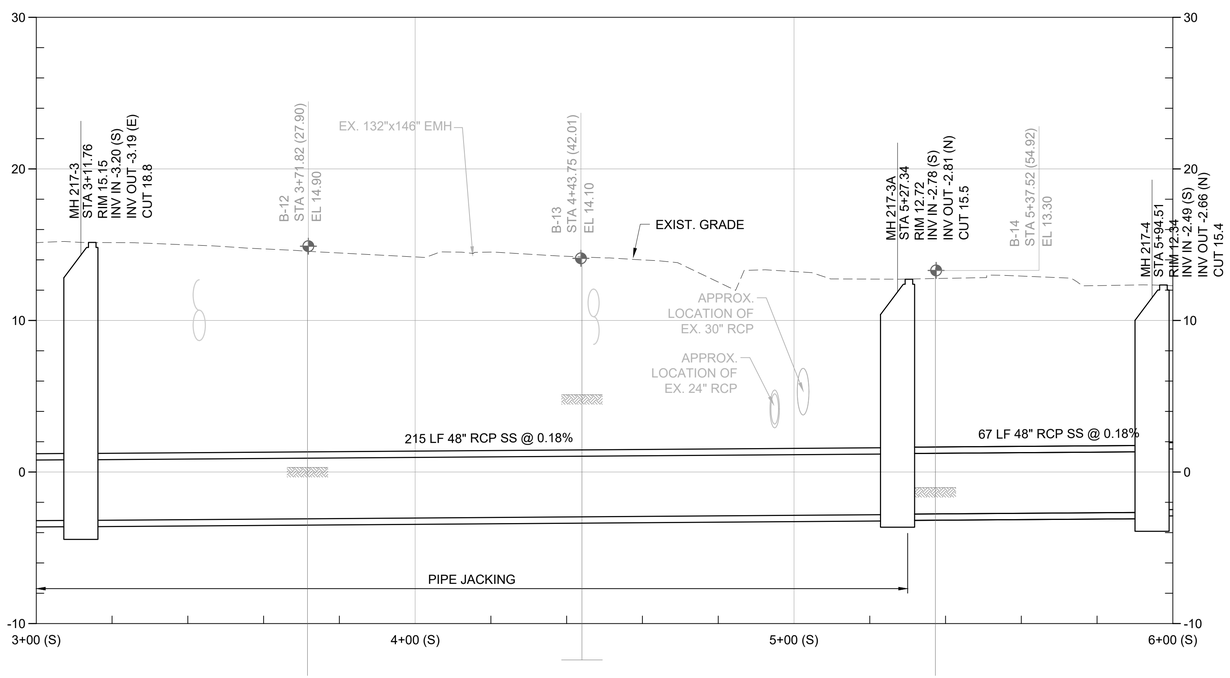
PLAN



A 1 SECTION
SCALE:1' = 20'



A 2 SECTION
SCALE:1' = 20'



PROFILE

KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0194J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BIRDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GRAY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. PIPE JACKING: STATION 3+11 TO STATION 5+27

B. AREA TO RECEIVE GROUND IMPROVEMENT - CHEMICAL INJECTION

C. RELOCATE WATER MAIN: STATION 3+00 TO STATION 3+35

D. RETAINING WALL STABILIZATION - GROUT INJECTION

E. REMOVE AND REPLACE DRAIN AND CATCH BASIN FOR INSTALLATION OF CONSOLIDATION CONDUIT: STATION 4+97, STATION 5+05

F. COORDINATE WITH CITY AND NATIONAL GRID TO ISOLATE AND REMOVE ELECTRIC LIGHT POLE:

G. REMOVE AND REPLACE RETAINING WALL:

H. REMOVE AND DISPOSE ABANDONED GAS MAIN: STATION 3+00 TO STATION 3+40

BY: JAMIE PAYNE

PLOT DATE: Friday, March 27, 2020 11:16:22 AM

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-4.dwg

REV	DATE	BY	DESCRIPTION

SCALE
H. SCALE 1"=20'
V. SCALE 1"=5'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION
This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA
www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

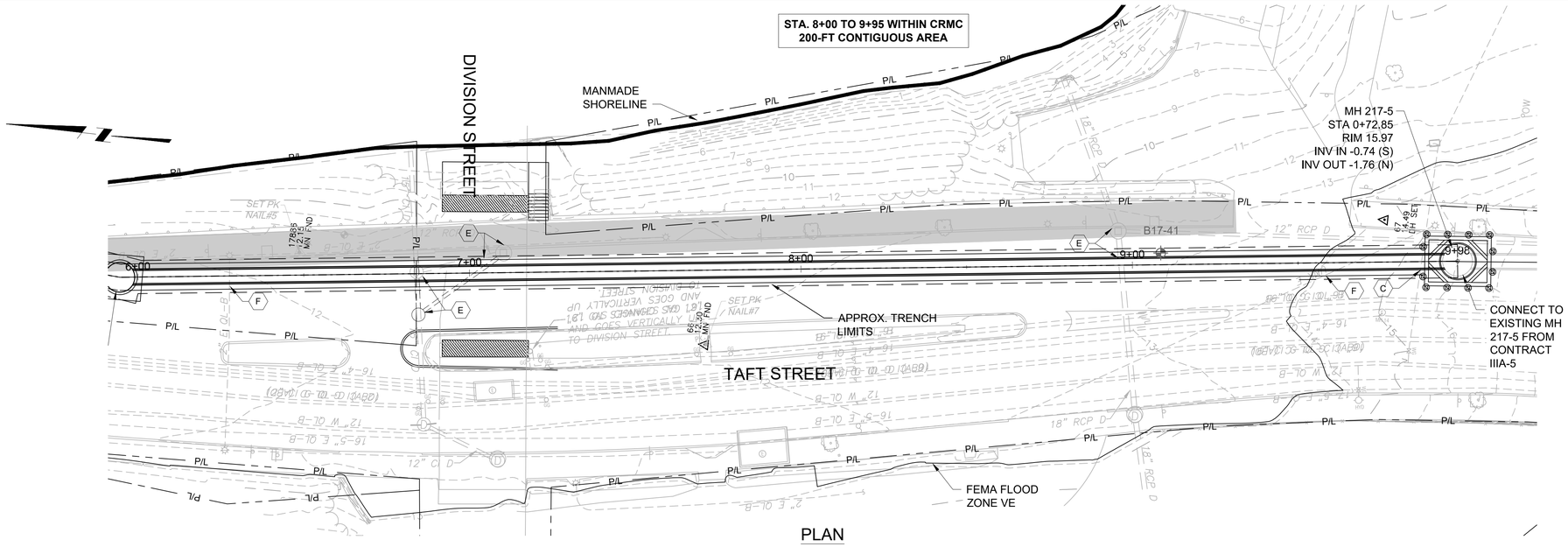
Stantec
PARE

NBC CONTRACT NO 308.XXC
CIVIL

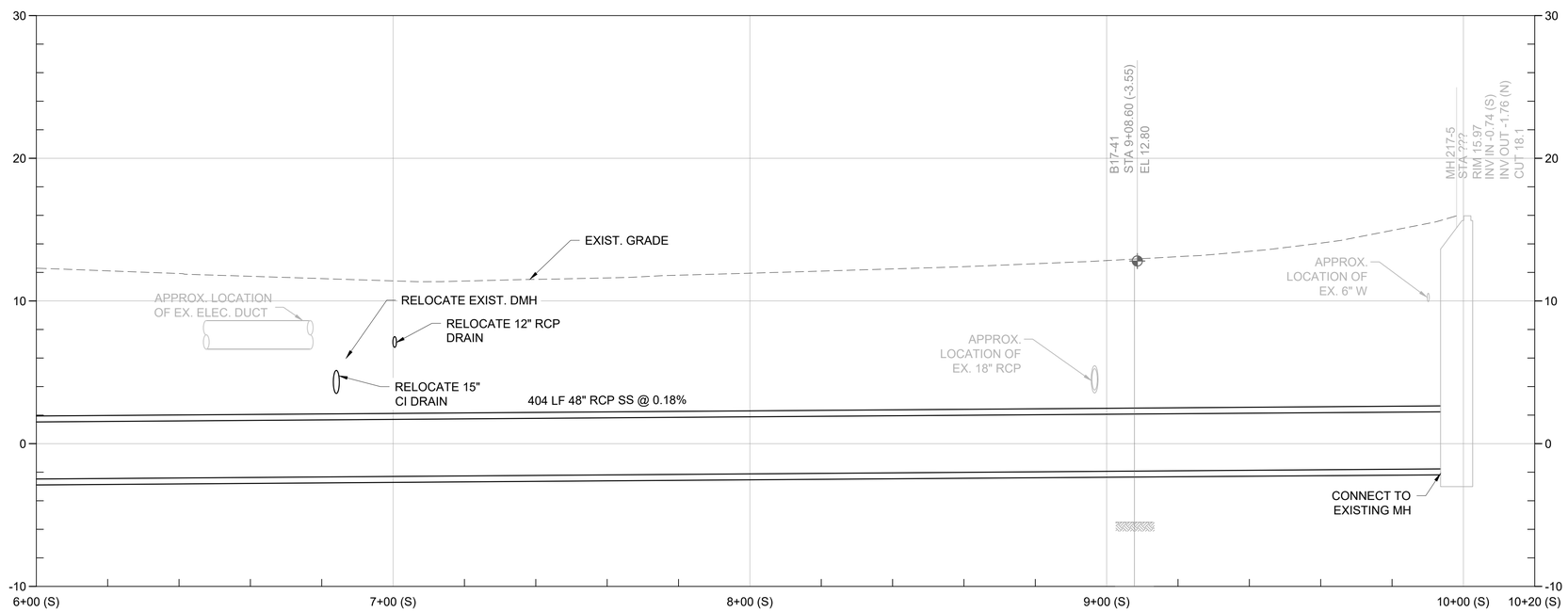
DROP SHAFT 213 CONSOLIDATION CONDUIT
PLAN AND PROFILE 5: STA 3+00 (S) - 6+00 (S)

SHEET
C-9

195130165



PLAN



PROFILE

KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0194J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BIRDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GRAY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. PIPE JACKING:

B. AREA TO RECEIVE GROUND IMPROVEMENT - CHEMICAL INJECTION

C. RELOCATE WATER MAIN: STATION 9+85 (HYDRANT SERVICE)

D. RETAINING WALL STABILIZATION - GROUT INJECTION

E. REMOVE AND REPLACE DRAIN AND CATCH BASIN FOR INSTALLATION OF CONSOLIDATION CONDUIT: STATION 6+80 TO STATION 7+10, STATION 8+95

F. COORDINATE WITH CITY AND NATIONAL GRID TO ISOLATE AND REMOVE ELECTRIC LIGHT POLE: STATION 6+25 AND STATION 9+60

G. REMOVE AND REPLACE RETAINING WALL:

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1"=20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

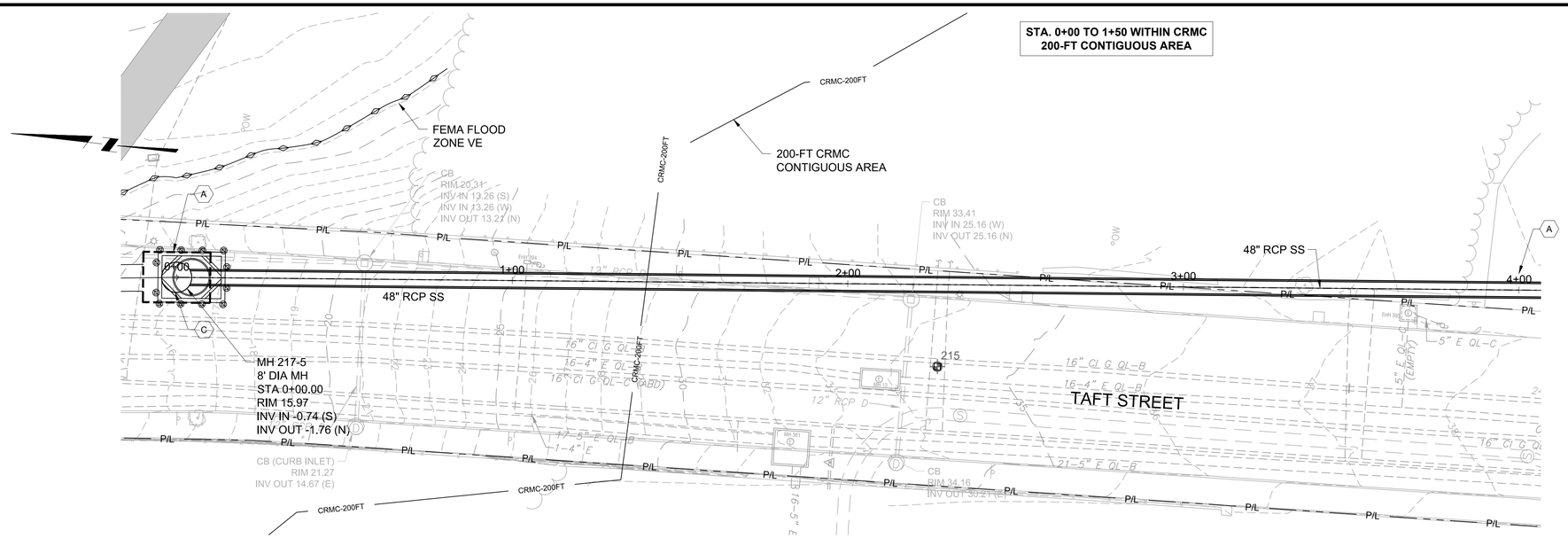
NBC CONTRACT NO 308.XXC
CIVIL

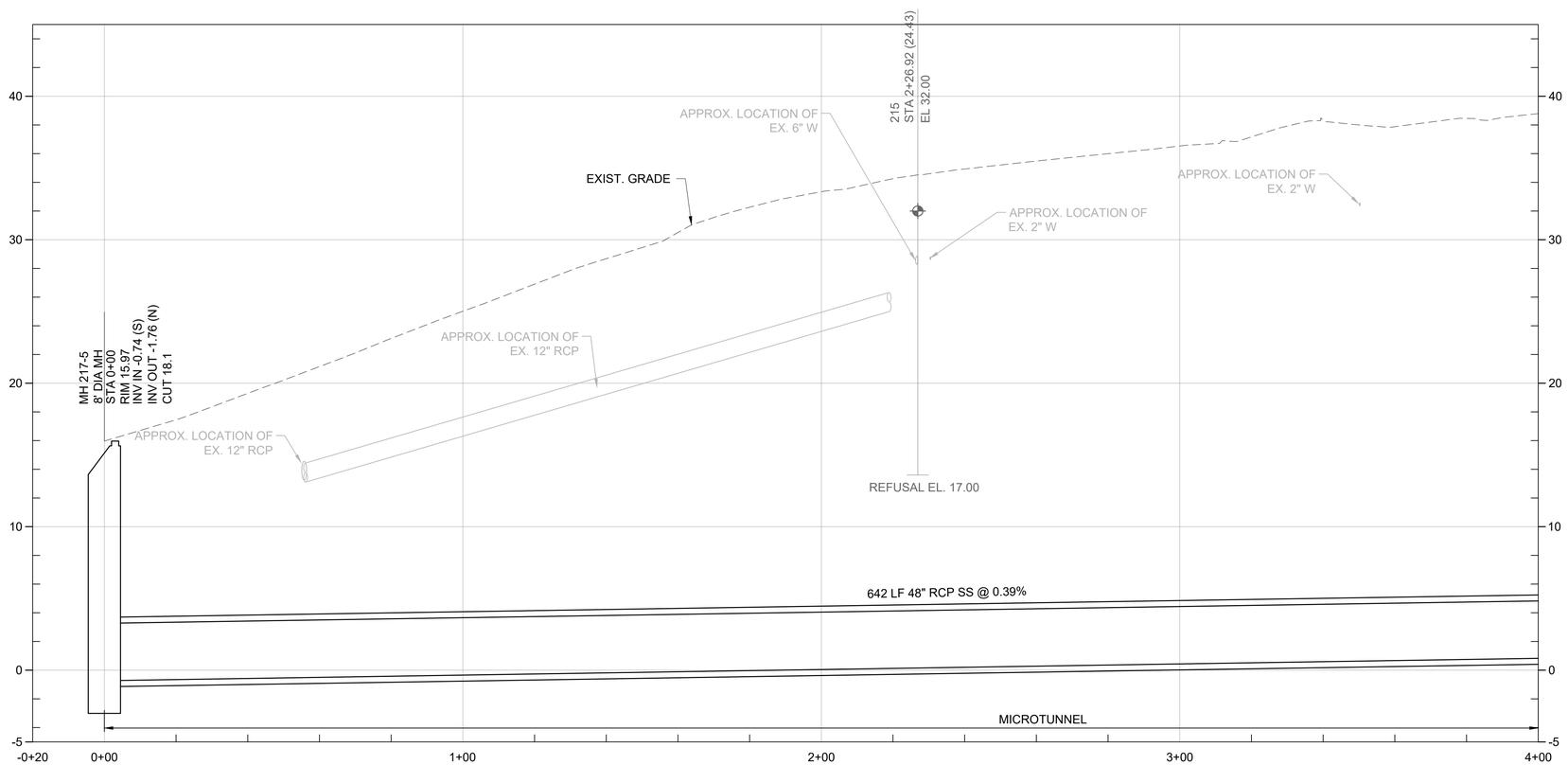
DROP SHAFT 213 CONSOLIDATION CONDUIT
PLAN AND PROFILE 6: STA 6+00 (S) - 10+00 (S)

SHEET C-10

195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-4.dwg
PLOT DATE: Friday, March 27, 2020 11:16:55 AM
BY: JAIMIE PAYNE





KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0307J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BRIDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GREY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. MICROTUNNEL: STATION 0+00 TO STATION 4+00

B. RELOCATE WATER MAIN:

C. EXCAVATION FOR MH 217-5 TO BE CONSTRUCTED AS RECEIVING PIT FOR MICROTUNNEL OPERATION

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1" = 20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

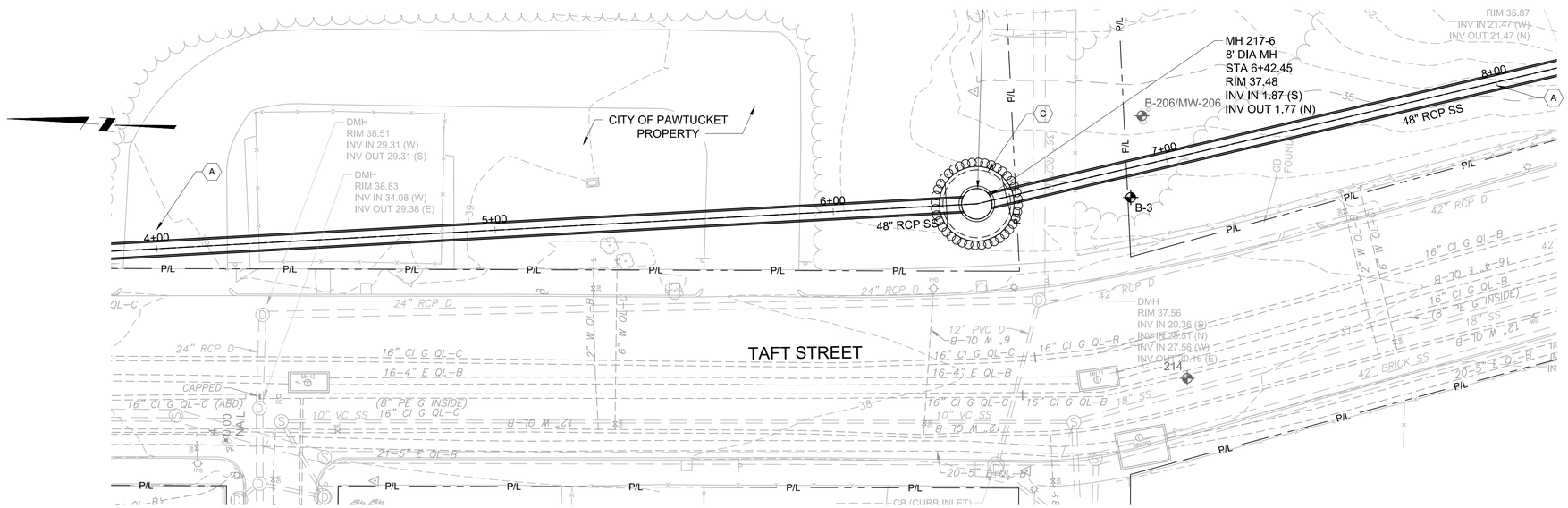
NBC CONTRACT NO 308.XXC
CIVIL

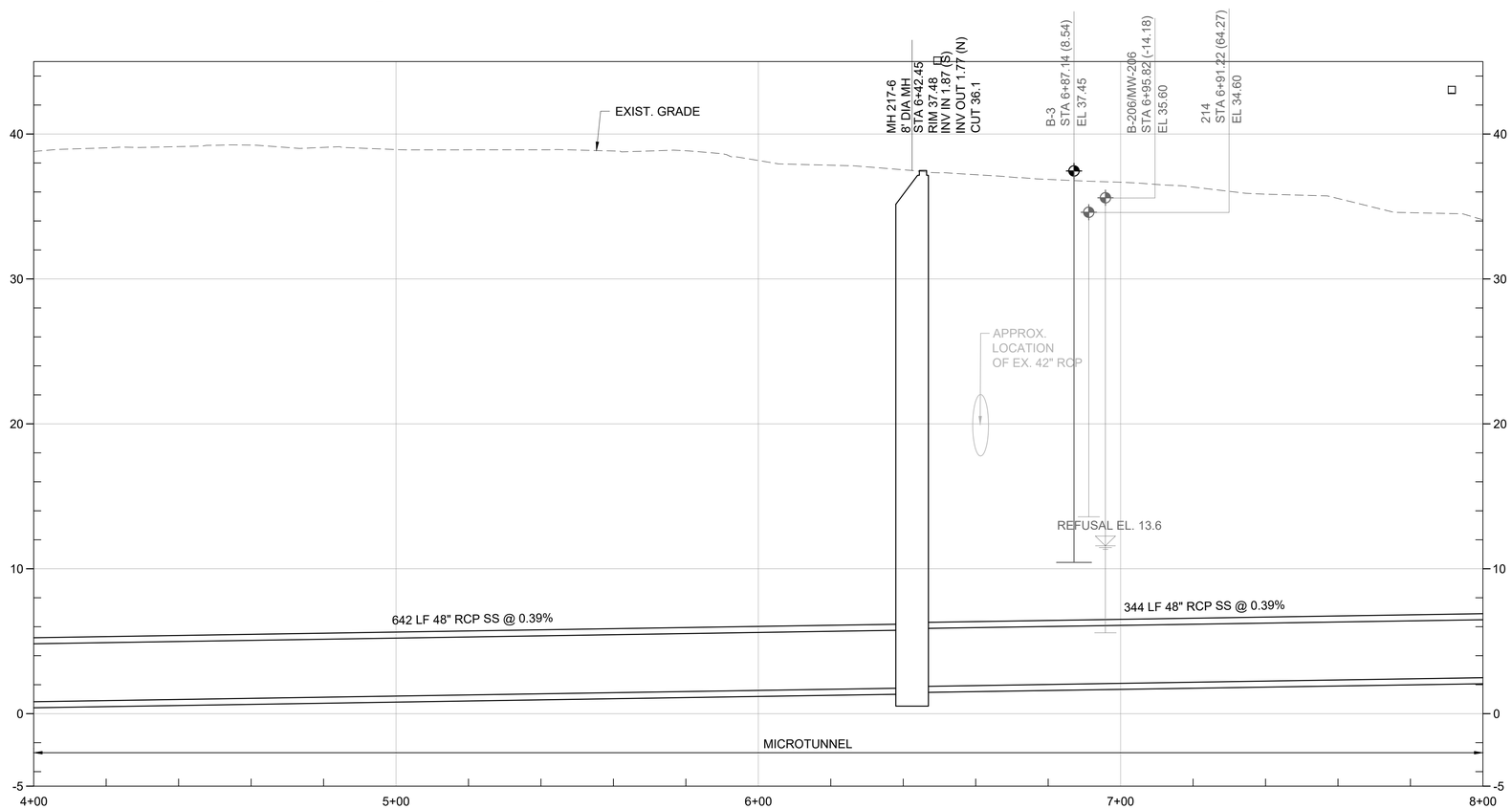
OF-217 CONSOLIDATION CONDUIT
PLAN AND PROFILE 1: STA 0+00 - 4+00

SHEET C-4

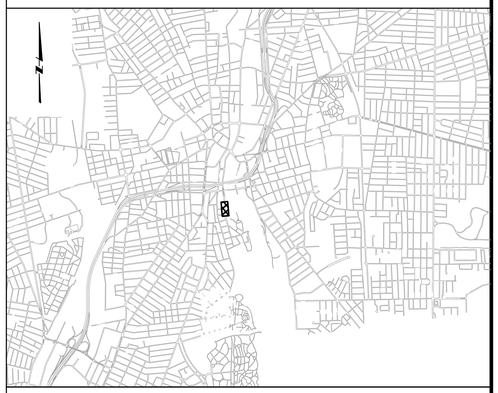
195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3.dwg
PLOT DATE: Wednesday, March 25, 2020 5:07:35 PM
BY: JAIMIE PAYNE





KEY PLAN



GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0307J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BRIDGE: VE ELEVATION 13.8
4. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GREY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. MICROTUNNEL: STATION 4+00 TO STATION 8+00

B. RELOCATE WATER MAIN:

C. EXCAVATION FOR MH 217-6 TO BE CONSTRUCTED AS DRIVING AND RECEIVING PIT IN SUPPORT OF MICROTUNNEL OPERATION

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1" = 20' V. SCALE 1"=5'

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.XXC

CIVIL

OF-217 CONSOLIDATION CONDUIT
PLAN AND PROFILE 2: STA 4+00 - 8+00

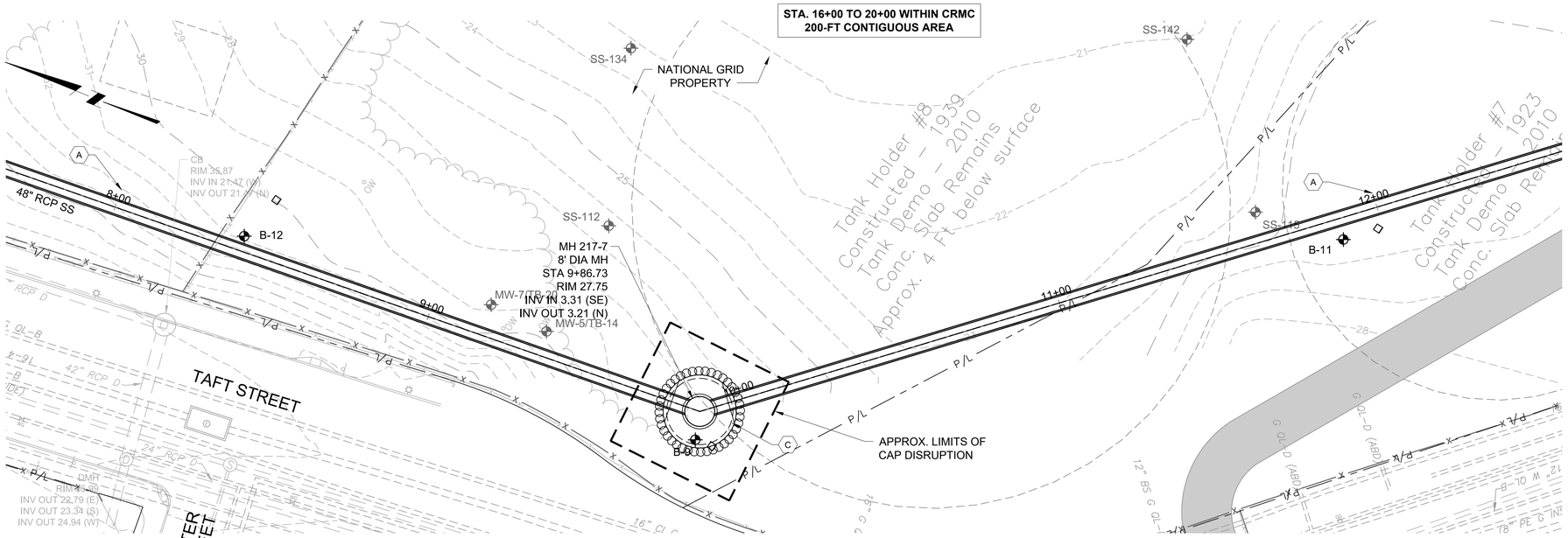
SHEET C-5

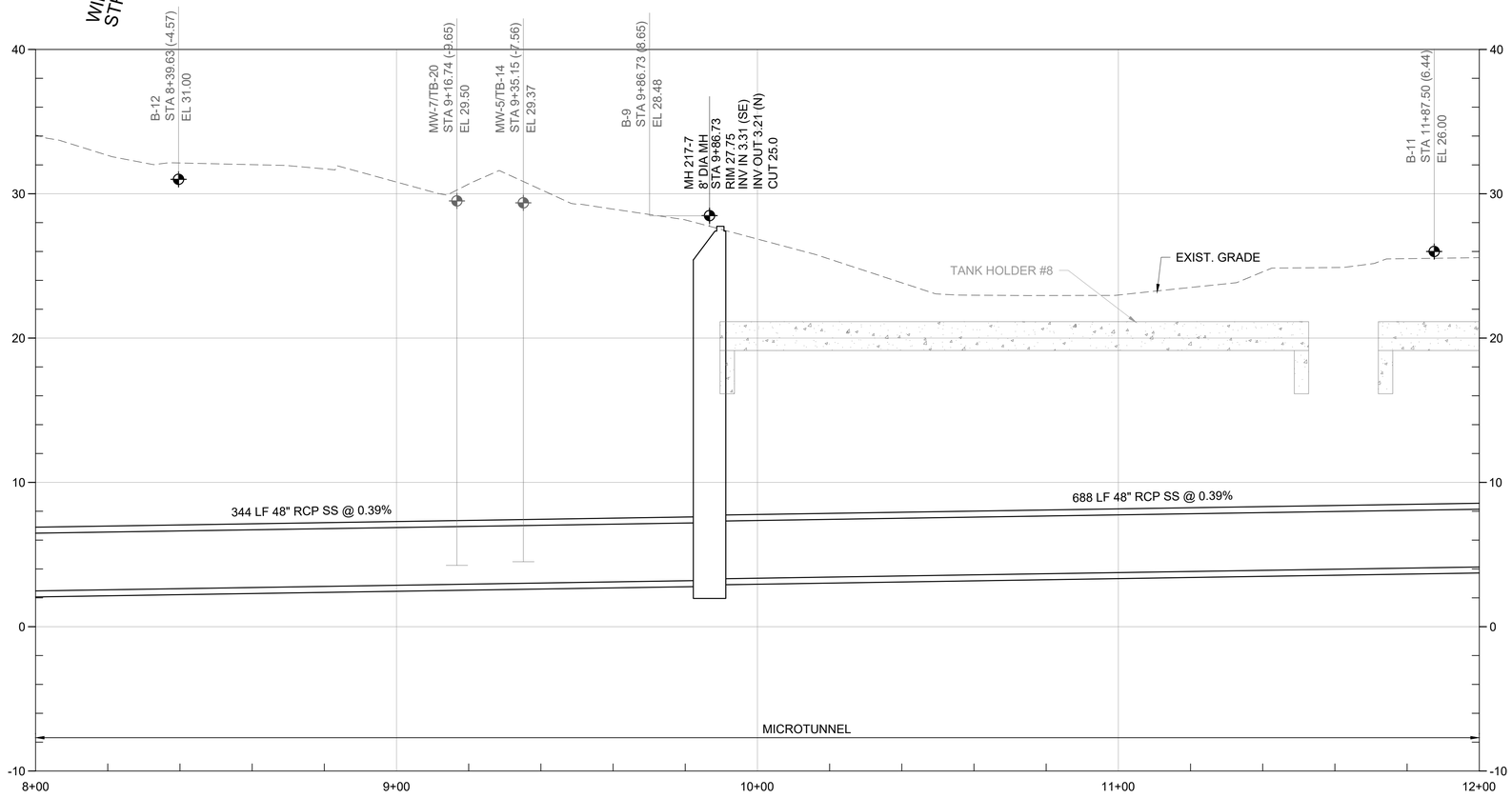
195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3.dwg

PLOT DATE: Wednesday, March 25, 2020 5:08:48 PM

BY: JAIMIE PAYNE





KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY BSI ENGINEERING INC. QL-B.
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0307J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BRIDGE: VE ELEVATION 13.8
4. WORK IS IN PROPERTY OWNED BY NATIONAL GRID
5. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GREY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. MICROTUNNEL: STATION 16+00 TO STATION 20+00

B. RELOCATE WATER MAIN:

C. EXCAVATION FOR MH 217-7 TO BE CONSTRUCTED AS DRIVING AND RECEIVING PITS IN SUPPORT OF MICROTUNNEL OPERATION

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1" = 20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

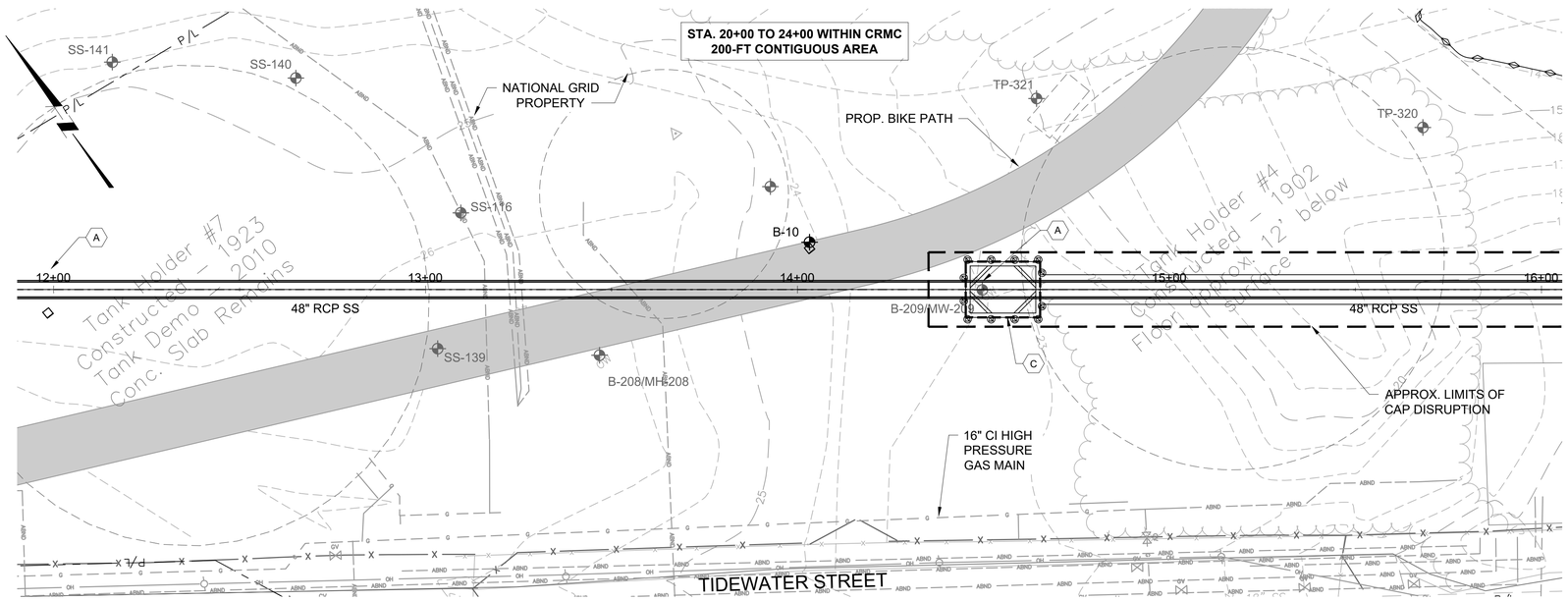
NBC CONTRACT NO 308.XXC
CIVIL

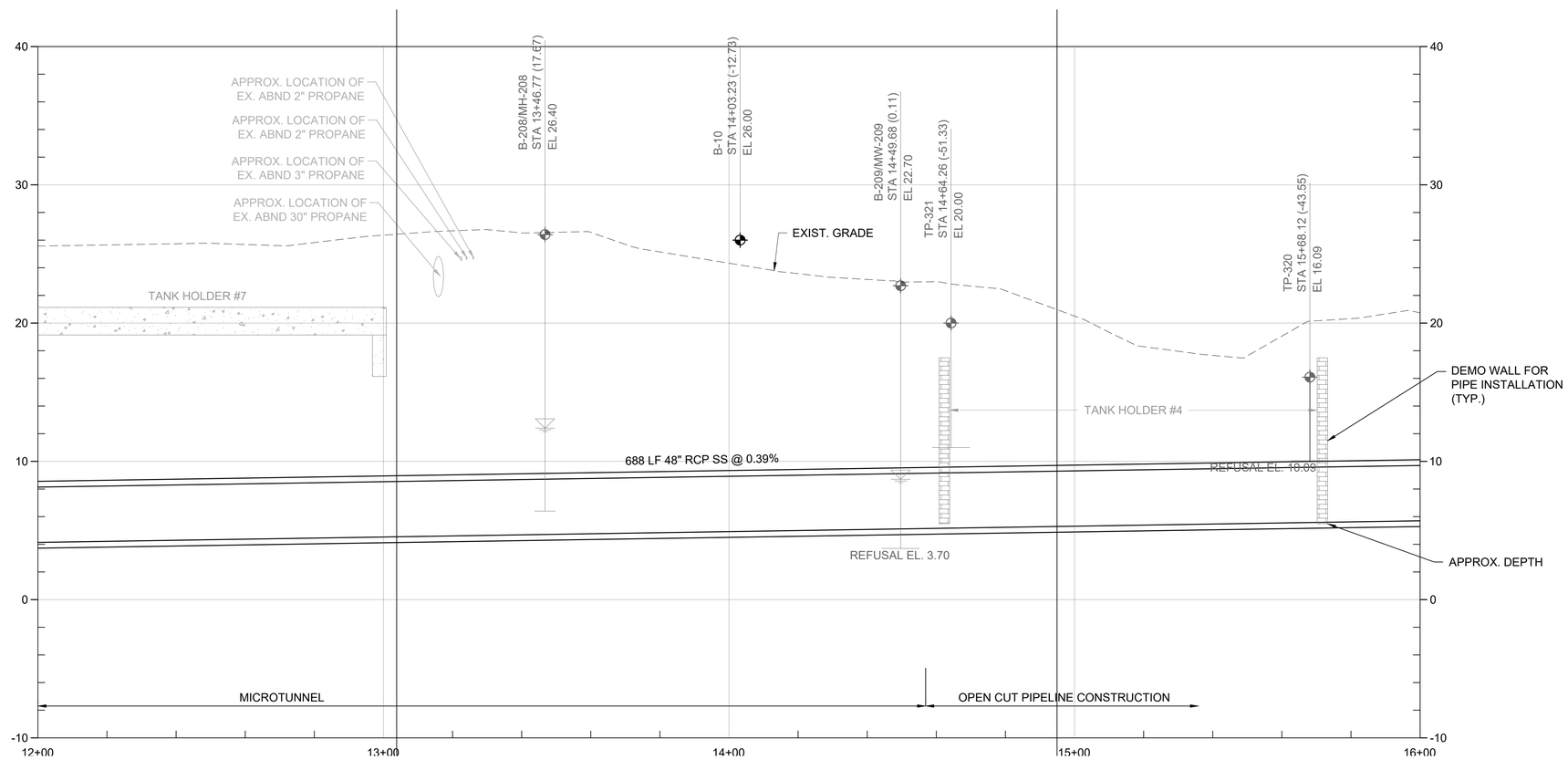
OF-217 CONSOLIDATION CONDUIT
PLAN AND PROFILE 3: STA 8+00 - 12+00

SHEET C-6

195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3.dwg
PLOT DATE: Wednesday, March 25, 2020 5:10:01 PM
BY: JAIMIE PAYNE





KEY PLAN

GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY NATIONAL GRID
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0307J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BRIDGE: VE ELEVATION 13.8
4. WORK IS IN PROPERTY OWNED BY NATIONAL GRID
5. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GREY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. MICROTUNNEL: STATION 12+00 TO STATION 14+50

B. RELOCATE WATER MAIN:

C. EXCAVATION AT 14+50 TO BE CONSTRUCTED AS RECEIVING PIT IN SUPPORT OF MICROTUNNEL OPERATION

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1" = 20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

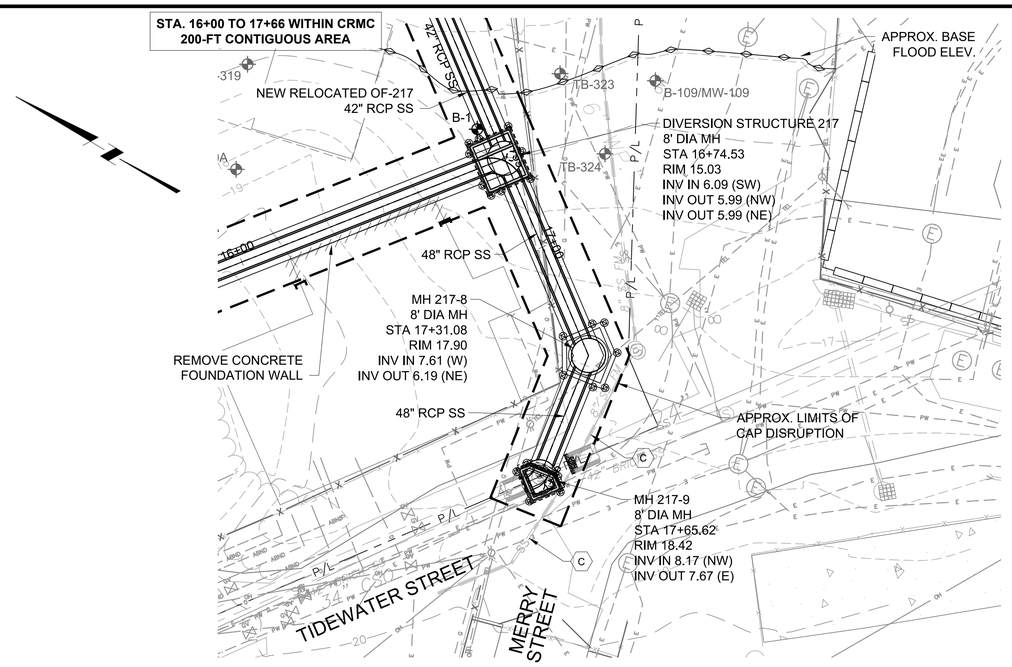
NBC CONTRACT NO 308.XXC
CIVIL

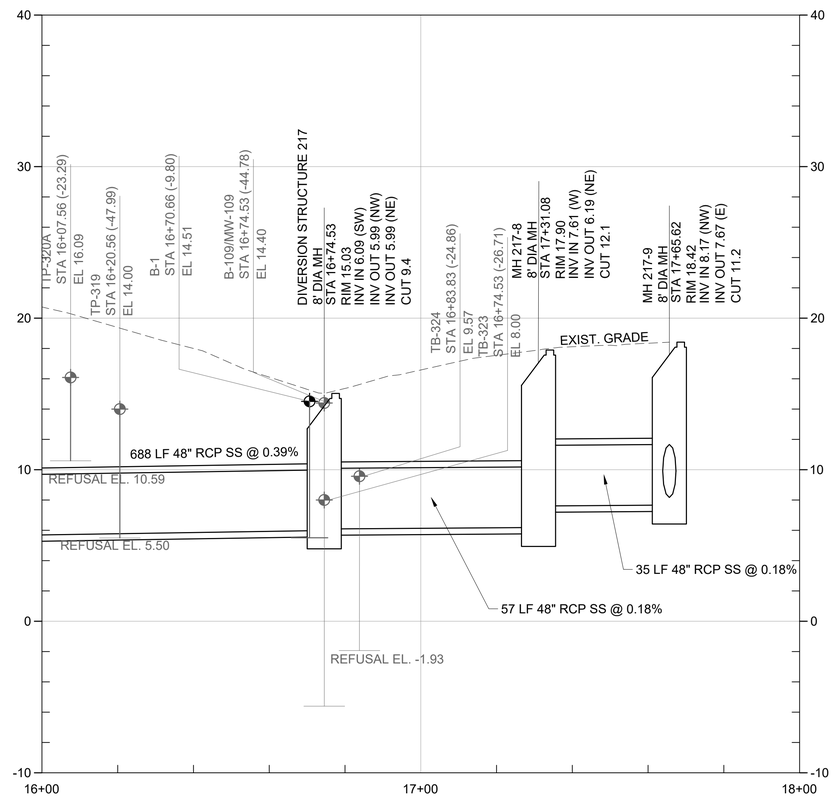
OF-217 CONSOLIDATION CONDUIT
PLAN AND PROFILE 4: STA 12+00 - 16+00

SHEET C-7

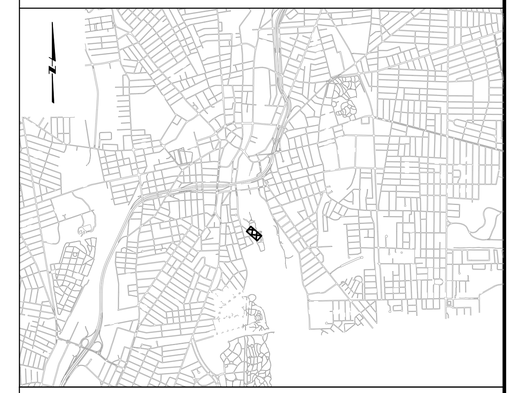
195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3.dwg
PLOT DATE: Wednesday, March 25, 2020 5:11:14 PM
BY: JAIMIE PAYNE





KEY PLAN



GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY NATIONAL GRID
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0307J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BRIDGE: VE ELEVATION 13.8
4. WORK IS IN PROPERTY OWNED BY NATIONAL GRID
5. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GREY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. MICROTUNNEL:

B. RELOCATE WATER MAIN:

C. RELOCATE SEWER FORCE MAIN:

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1" = 20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION

This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

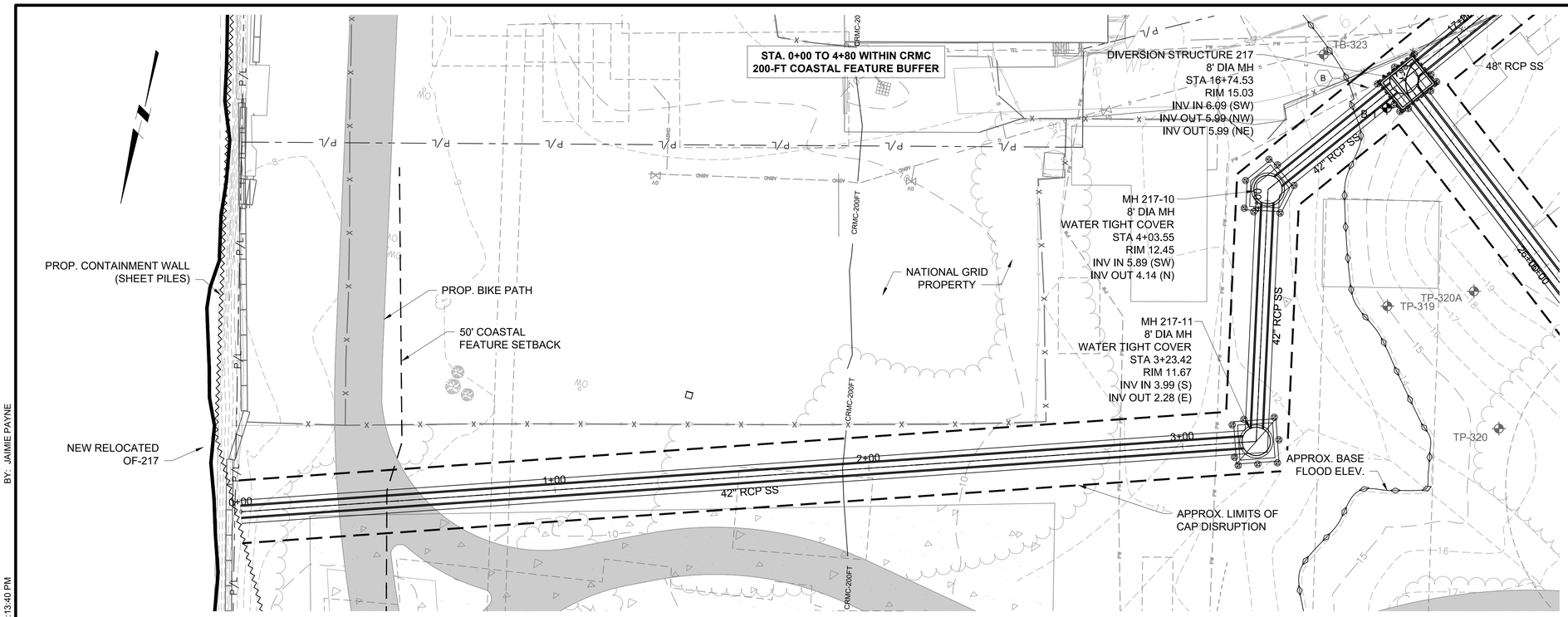
NBC CONTRACT NO 308.XXC
CIVIL

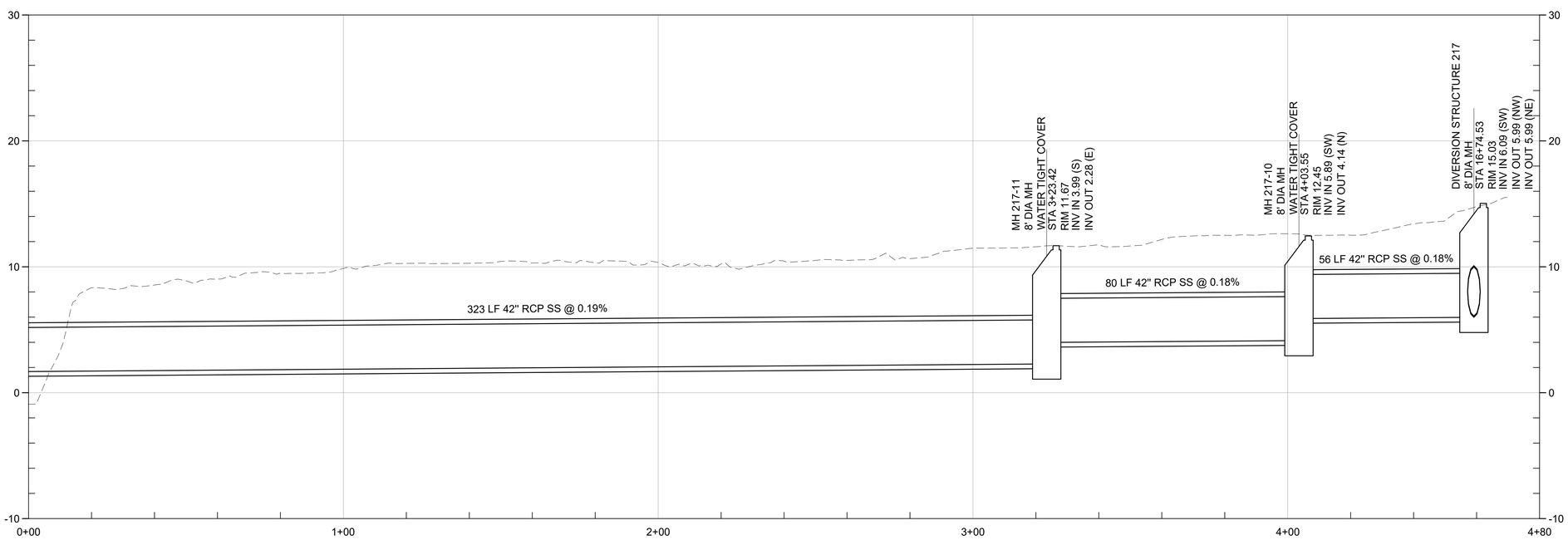
OF-217 CONSOLIDATION CONDUIT
PLAN AND PROFILE 5: STA 16+00 - 18+00

SHEET C-8

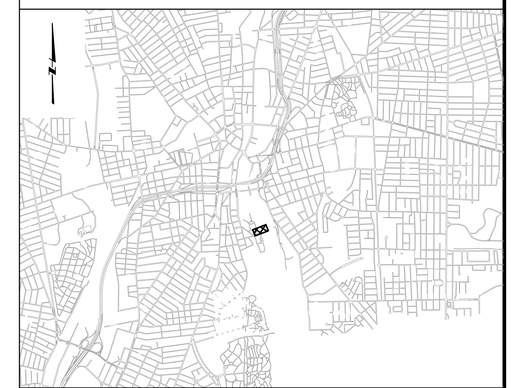
195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3.dwg
PLOT DATE: Wednesday, March 25, 2020 5:12:27 PM
BY: JAIMIE PAYNE





KEY PLAN



GENERAL SHEET NOTES

1. SURVEY INFORMATION PROVIDED BY BRYANT AND ASSOCIATES, INC. NOVEMBER 2019, VERTICAL DATUM NGVD 1929, HORIZONTAL DATUM, STATE PLAN COORDINATE SYSTEM.
2. UTILITY INFORMATION DEPICTED, PROVIDED BY NATIONAL GRID
3. FLOOD PLAIN INFORMATION IS FROM FEMA, PANEL NO. 44007C0307J. FLOOD PLAIN ELEVATIONS CONVERTED FROM VERTICAL DATUM NAVD 1988 TO NGVD 1929 AND ARE APPROXIMATELY:
   - NORTH OF DIVISION STREET BRIDGE: AE ELEVATION 12.8
   - SOUTH OF DIVISION STREET BRIDGE: VE ELEVATION 13.8
4. WORK IS IN PROPERTY OWNED BY NATIONAL GRID
5. CITY PROPOSED BIKE PATH PROJECT DEPICTED IN GREY SHADING FOR COORDINATION.

SHEET KEYNOTES

A. MICROTUNNEL:

B. RELOCATE WATER MAIN: AT OF-217 DIVERSION STRUCTURE

REV	DATE	BY	DESCRIPTION

SCALE: H. SCALE 1" = 20' V. SCALE 1"=5'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED C CRONIN
DRAWN B MARINI
CHECKED C CRONIN

30% DESIGN PHASE - APRIL 2020

NOT FOR CONSTRUCTION
This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

BETA www.BETA-Inc.com

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM
Stantec PARE

NBC CONTRACT NO 308.XXC
CIVIL

OF-217 CONSOLIDATION CONDUIT
PLAN AND PROFILE 6: STA 0+00 - 4+80

SHEET C-9

195130165

DWG FILE: C:\pwworkdir\d0520964\PAWT_SITE_PLAN_&_PROFILE_IIIA-5_ALT3.dwg
PLOT DATE: Wednesday, March 25, 2020 5:13:40 PM
BY: JAIMIE PAYNE

APPENDIX A

EDR REGULATORY DATABASE REPORT EXECUTIVE SUMMARY

Taft St
Taft St
Pawtucket, RI 02860

Inquiry Number: 5664991.2s
May 28, 2019

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	8
Orphan Summary	834
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-10
Physical Setting Source Map Findings	A-12
Physical Setting Source Records Searched	PSGR-1

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2019 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

TAFT ST
PAWTUCKET, RI 02860

COORDINATES

Latitude (North):	41.8725630 - 41˚ 52' 21.22''
Longitude (West):	71.3847390 - 71˚ 23' 5.06''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	302096.2
UTM Y (Meters):	4638163.5
Elevation:	10 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5644908 PROVIDENCE, RI
Version Date:	2012
Northeast Map:	5641995 ATTLEBORO, MA
Version Date:	2012
Southeast Map:	5642183 EAST PROVIDENCE, RI
Version Date:	2012
Northwest Map:	5644906 PAWTUCKET, RI
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140718
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	TOWN LANDING	TAFT STREET	US BROWNFIELDS		TP
A2	PET FOOD EXPERTS LLC	175 MAIN STREET	RI SHWS, RI AUL	Higher	1 ft.
3	NEW ENGLAND GAS CO T	91 TIDEWATER ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	23, 0.004, South
B4	TIDEWATER COAL GASIF	OFF TIDEWATER AVE	EDR MGP	Higher	53, 0.010, SSE
C5	NEW ENGLAND TELEPHON	2 PLEASANT ST	RI UST	Higher	58, 0.011, North
A6	S. PAPADOPOULO & K.	30 EAST AVE	RI UST	Higher	67, 0.013, North
A7	SAMOS PRESS	30 EAST AVE	RCRA NonGen / NLR, RI MANIFEST	Higher	67, 0.013, North
A8	BLACKSTONE VALLEY CO	30 EAST AVENUE, SUIT	RCRA-CESQG	Higher	67, 0.013, North
B9	TIDEWATER COAL GASSI	OFF TIDEWATER AVENUE	SEMS	Higher	68, 0.013, SSE
A10	SOVEREIGN BANK	210 MAIN STREET	RI SHWS, RI AUL, RI SPILLS	Higher	89, 0.017, North
A11	COMMERCIAL PROPERTY	40 EAST AVE	RI UST	Higher	96, 0.018, North
D12	SPINGARN ANDREW CO	88 PLEASANT ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	98, 0.019, NNW
D13	SPRINGARN ANDREW CO	88 PLEASANT ST	RCRA NonGen / NLR	Higher	98, 0.019, NNW
D14	GEM AIR POWER INC	80 PLEASANT ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	105, 0.020, NNW
E15	REGAL CAR CARE	65 EAST ST	RI UST	Higher	117, 0.022, North
E16	ADAMS FURNITURE	65 EAST AVE	RI UST	Higher	117, 0.022, North
E17	ADAMS FURNITURE	65 EAST AVENUE	RI LUST	Higher	117, 0.022, North
A18	VITALI PROPERTY	216 MAIN ST	RI UST	Higher	127, 0.024, North
C19	SHOVE INSURANCE REAL	100 EAST AVE	RI UST	Higher	140, 0.027, NNW
B20	TIDEWATER COAL GASSI	TIDEWATER STREET	RI SHWS	Higher	159, 0.030, SSE
B21	VALLEY GAS COMPANY	TIDEWATER ST	RI UST	Higher	159, 0.030, SSE
22	SLATER MILL WALL REP	67 ROOSEVELT AVENUE	RI SHWS	Higher	195, 0.037, NNE
F23	LAWN TERRACE APARTME	180-226 PLEASANT ST	RI SHWS, RI UST, RI AUL	Higher	199, 0.038, SW
G24	COMMERCIAL PROPERTY	228-230 MAIN ST	RI UST	Higher	205, 0.039, North
25	BLACKSTONE VALLEY EL	MERRY ST	RI UST	Higher	248, 0.047, SSE
H26	PRIDE HYUNDAI	20 DIVISION ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	277, 0.052, ENE
H27	RIDOT - 20 DIVISION	20 DIVISION ST	RI UST	Higher	277, 0.052, ENE
F28	E & A TAVERN	25 PAWTUCKET AVE	RI UST	Higher	279, 0.053, WSW
I29	APEX AUTOMOTIVE SERV	1 SCHOOL ST	RCRA-SQG, FINDS, ECHO, RI MANIFEST	Higher	322, 0.061, NNE
I30	APEX DEVELOPMENT CO.	1 SCHOOL ST	RI UST	Higher	322, 0.061, NNE
H31	BLACKSTONE AUTO BODY	28 DIVISION ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	354, 0.067, East
G32	COMMERCIAL PROPERTY	250 MAIN ST	RI UST	Higher	387, 0.073, North
H33	MERCHANTS TIRE	21 DIVISION ST	RI SHWS, RI UST, RI AUL, RCRA NonGen / NLR, FINDS,...	Higher	411, 0.078, East
J34	PODIATRY SERVICES LT	10 SUMMER ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	446, 0.084, North
35	APEX INC	100 MAIN ST	RI SHWS, RI AUL, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	459, 0.087, NE
K36	MR USA 1 HOUR CLEANI	224 EAST AVE	RI AIRS, RI DRYCLEANERS	Higher	472, 0.089, WSW
K37	MR USA 1 HOUR CLEANE	224 EAST AVE	RCRA-SQG, US AIRS, ECHO, RI MANIFEST	Higher	472, 0.089, WSW
K38	STANLEY SYSTEM DRY C	224 EAST AVE	EDR Hist Cleaner	Higher	472, 0.089, WSW
K39	DZIALO WALTER M DDS	225 EAST AVE	RCRA NonGen / NLR, RI MANIFEST	Higher	506, 0.096, WSW

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
K40	COMMERCIAL OFFICE BU	225 EAST AVE	RI UST	Higher	506, 0.096, WSW
L41	MANNING-HEFFRON FUNE	68 BROADWAY	RI UST	Higher	562, 0.106, NNE
M42	PARTY WAREHOUSE	310 EAST AVE	RI UST	Higher	583, 0.110, SW
M43	CREST PHOTO LABS	324 EAST AVE	RI UST	Higher	593, 0.112, SSW
N44	LANTAU ISLAND, INC.	286 MAIN ST	RI UST	Higher	594, 0.112, North
J45	YMCA	20 SUMMER ST	RI UST	Higher	610, 0.116, North
J46	YOUNG MEN CHRISTIAN	20 SUMMER STREET	RI LUST	Higher	610, 0.116, North
O47	DISPLAY CREATIONS	93 PARK PL	RI UST	Higher	625, 0.118, NNW
P48	ST. PAUL'S EPISCOPAL	50 PARK PL	RI UST	Higher	629, 0.119, NNW
J49	NYNEX CTL OFF	85 HIGH ST	RCRA NonGen / NLR, FINDS, ECHO, RI AIRS, RI...	Higher	630, 0.119, North
J50	VERIZON NEW ENGLAND,	85 HIGH ST	RI UST	Higher	630, 0.119, North
P51	JAMES CORDANO	36 PARK PL	RI UST	Higher	631, 0.120, NNW
P52	BLACKSTONE VALLEY CO	42 PARK PLACE	RCRA-SQG, RI MANIFEST	Higher	637, 0.121, NNW
P53	BLACKSTONE VALLEY CO	42 PARK PL	RI UST	Higher	637, 0.121, NNW
N54	LANTAU, INC. PROPERT	298 MAIN ST	RI UST	Higher	650, 0.123, NNW
N55	NORTHERN PLAZA	301 MAIN ST	RI UST	Higher	660, 0.125, NNW
N56	NORTHERN PLAZA ASSOC	301 MAIN ST.	RI AST	Higher	660, 0.125, NNW
Q57	RIDOT PROJECT	50 DIVISION ST	NY MANIFEST	Higher	673, 0.127, East
O58	PRESERVATION SOCIETY	67 PARK PL	RI UST	Higher	694, 0.131, NNW
R59	WEINBERG COMMERCIAL	26 SUMMER STREET	RI SHWS, RI AUL	Higher	697, 0.132, North
S60	PILAVIN PROPERTIES,	33 MAIN STREET	RI SHWS	Higher	699, 0.132, NE
S61	ST GEORGE'S CHURCH (	46 MAIN STREET	RI SHWS, RI AUL	Higher	705, 0.134, NE
L62	PAWTUCKET CONGREGATI	40 WALCOTT ST	RI UST	Higher	716, 0.136, NE
T63	SALVATION ARMY -- PA	102 HIGH ST	RI UST	Higher	724, 0.137, North
L64	OLD MONTGOMERY DISTR	100 BROADWAY	RI UST	Higher	726, 0.138, NE
65	LARRY SHUSHANSKI RES	351 EAST AVE	RI UST	Higher	733, 0.139, SSW
66	APEX DEVELOPMENT 2 -	10 SCHOOL STREET	RI SHWS, RI AUL	Higher	739, 0.140, NE
S67	PITCHER STREET REALT	26 MAIN ST	RI UST	Higher	751, 0.142, NE
U68	EDDY CHEVROLET & BUI	45-55 DIVISION STREE	NY MANIFEST	Higher	782, 0.148, ESE
U69	EDDY CHEVROLET (FORM	45-55 DIVISION ST	RI UST	Higher	782, 0.148, ESE
U70	VIKING CHEVROLET GEO	45-55 DIVISION ST	RI SHWS, RI LUST, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	782, 0.148, ESE
R71	MCGRATH PHILIP DR	23 BROAD ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	789, 0.149, North
Q72	WIDE WATER PARKWAY	55 DIVISION ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	796, 0.151, East
T73	HALL INSTITUTE (FORM	120 HIGH ST	RI UST	Higher	815, 0.154, North
V74	CITY OF PAWTUCKET	137 ROOSEVELT AVE	RI UST	Higher	816, 0.155, NNE
M75	PAWTUCKET LAYOVER FA	PLAT 59 & 61, LOT 22	RI SHWS	Higher	831, 0.157, SW
Q76	PAWTUCKET BUSINESS A	123 SCHOOL ST	RI UST	Higher	833, 0.158, ENE
Q77	LAPRADE ANDRE J DMD	123 SCHOOL ST	RCRA-SQG	Higher	833, 0.158, ENE
Q78	PHOTOPOULOS D JAMES	123 SCHOOL ST	RCRA-SQG, RI SHWS, RI AUL, FINDS, ECHO, RI...	Higher	833, 0.158, ENE

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
Q79	PHOTOPOULOS D JAMES	123 SCHOOL ST	RCRA-SQG, RI MANIFEST	Higher	833, 0.158, ENE
V80	TOLMAN HIGH SCHOOL	EXCHANGE STREET	RI LUST	Higher	839, 0.159, NNE
81	VARIEUR ELEMENTARY S	468 PLEASANT STREET	RI SHWS	Higher	844, 0.160, South
82	PAWTUCKET REDEVELOPM	370 MAIN ST	RI UST	Higher	846, 0.160, NNW
83	LANMAR APARTMENTS -	19 HARRISON ST	RI UST	Higher	849, 0.161, WNW
84	BROADWAY STREET HOLD	169 GEORGE ST	RI UST	Higher	850, 0.161, SW
R85	FAMILY SERVICES SOCI	33 SUMMER ST	RI UST	Higher	850, 0.161, North
W86	GIBBY'S SERVICE	385 EAST ST	RI UST	Higher	881, 0.167, SSW
87	BROADWAY APARTMENTS	142-144 BROADWAY	RI UST	Higher	910, 0.172, NE
88	ROWE AUTOMATIC SALES	51 S UNION ST	RCRA NonGen / NLR, RI MANIFEST	Higher	911, 0.173, NW
X89	ST JOSEPH HEALTH CEN	40 BROAD ST	RCRA NonGen / NLR, RI MANIFEST	Higher	917, 0.174, North
Y90	SUNOCO STATION	35 CEDAR STREET	RI LUST	Higher	917, 0.174, WNW
Y91	SUNOCO #0006-0582	35 CEDAR ST	RI UST	Higher	917, 0.174, WNW
Y92	SUNOCO SERVICE STA	35 CEDAR ST	RCRA-SQG, RI MANIFEST	Higher	917, 0.174, WNW
Z93	NORTHEAST INSULATION	279 SCHOOL ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	927, 0.176, SE
Z94	B.V. MEDICAL	279 SCHOOL ST	RI UST	Higher	927, 0.176, SE
AA95	CARITAS HOUSE GROUP	166 PAWTUCKET AVE	RI UST	Higher	928, 0.176, SW
W96	ORTHOPAEDICS OF NEW	407 EAST AVE SUITE 1	RCRA NonGen / NLR	Higher	939, 0.178, SSW
W97	FORTUNA ROBERT J MD	407 EAST AVE SUITE 1	RCRA NonGen / NLR, RI MANIFEST	Higher	939, 0.178, SSW
W98	CVI PAWTUCKET	407 EAST AVENUE	RCRA-CESQG	Higher	962, 0.182, SSW
AB99	OLD COLONY BANK PARK	MAIN STREET	US BROWNFIELDS	Higher	963, 0.182, NNW
AB100	OLD COLONY BANK	335 MAIN STREET	US BROWNFIELDS	Higher	963, 0.182, NNW
AC101	SPORTS MEDICINE ORTH	127 SCHOOL ST	RCRA NonGen / NLR, RI MANIFEST	Higher	972, 0.184, East
AC102	SUNOCO SERVICE STA	81 SCHOOL ST	RI LUST, RI UST, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	972, 0.184, ENE
AD103	PAWTUCKET EVENING TI	23 EXCHANGE ST	RI UST	Higher	990, 0.188, North
AD104	TIMES THE	23 EXCHANGE ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	990, 0.188, North
105	DIVISION STREET PROJ	SCHOOL AND POND STRE	US BROWNFIELDS, FINDS	Higher	995, 0.188, ESE
AC106	BOWERS REALTY, INC.	79 DIVISION ST	RI UST	Higher	996, 0.189, East
107	THE PAWTUCKET SPOT	72 EXCHANGE ST	RI LUST, RI UST	Higher	1002, 0.190, North
AE108	CITY OF PAWTUCKET PR	100 TIM HEALEY WAY	RI UST	Higher	1011, 0.191, SE
AE109	DR. GOLF	100 TIM HEALEY WAY	US BROWNFIELDS	Higher	1011, 0.191, SE
AE110	DR. GOLF (SEE NJD-26	100 TIM HEALEY WAY	RI SHWS, RI BROWNFIELDS	Higher	1011, 0.191, SE
AC111	MCKEE BROS. OIL CORP	76 SCHOOL ST	RI UST	Higher	1011, 0.191, ENE
X112	NATIONAL GRID - VAUL	GOFF & BROAD STREET	RI SHWS	Higher	1028, 0.195, North
AF113	C V S #2234	425 EAST AVE	RCRA-LQG, RI MANIFEST	Higher	1050, 0.199, SSW
AG114	ROGUE PAUL G DDS	32 GOFF AVE RM 205	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	1065, 0.202, NNW
AB115	J.P. REALTY	450 MAIN ST	RI UST	Higher	1087, 0.206, NW
AB116	PARKIN YARN (FORMER)	21 COMMERCE STREET	RI SHWS, RI AUL	Higher	1100, 0.208, NNW
X117	CENTENIAL TOWERS	35 GOFF STREET	RI SHWS, RI AUL	Higher	1109, 0.210, NNW

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
118	ROOSEVELT AVENUE DIS	ROOSEVELT AVENUE	RI SHWS	Higher	1121, 0.212, NNE
AA119	ROYAL CLEANSERS INC	191 PAWTUCKET AVE	RCRA NonGen / NLR, FINDS, ECHO	Higher	1123, 0.213, SW
Y120	SHELL STATION	71 CEDAR STREET	RI LUST	Higher	1143, 0.216, WNW
Y121	JOE'S CEDAR STREET S	71 CEDAR ST & PINE	RCRA-SQG, FINDS, ECHO, RI MANIFEST	Higher	1143, 0.216, WNW
Y122	JOE'S CEDAR ST. SHEL	71 CEDAR ST	RI UST	Higher	1143, 0.216, WNW
AG123	TEXACO STATION	GOFF AVENUE & DEXTER	RI LUST	Higher	1147, 0.217, NNW
AH124	HASKELL WILLIAM H MF	24 COMMERCE ST	RI LUST, RCRA NonGen / NLR, FINDS, ECHO, RI...	Higher	1153, 0.218, NNW
AH125	KELLAWAY	24 COMMERCE ST	RI UST	Higher	1153, 0.218, NNW
AI126	SLATER COTTON MILL	46 CHURCH ST	RI UST	Higher	1167, 0.221, NW
AI127	HUTCHINSON GROUP THE	46 CHURCH ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	1167, 0.221, NW
AJ128	GEORGE H FULLER AND	151 EXCHANGE ST	RI LUST, FINDS, RI AIRS	Higher	1171, 0.222, NNE
AJ129	GEORGE H FULLER AND	151 EXCHANGE ST	RI UST	Higher	1171, 0.222, NNE
AJ130	FULLER GEORGE H & SO	151 EXCHANGE ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	1171, 0.222, NNE
AF131	APARTMENT HOUSE	447 EAST AVE	RI UST	Higher	1190, 0.225, SSW
AE132	BLACKSTONE VALLEY ME	333 SCHOOL ST	RI UST	Higher	1210, 0.229, SE
AE133	R I MEDICAL IMAGING	333 SCHOOL ST	RCRA-SQG, FINDS, ECHO, RI MANIFEST	Higher	1210, 0.229, SE
AE134	SILVERMAN ANDREW B D	333 SCHOOL ST STE 20	RCRA-SQG, RI MANIFEST	Higher	1210, 0.229, SE
AG135	GOFF GAS	75 GOFF AVE	RI UST	Higher	1222, 0.231, NNW
AG136	TEXACO STA/COLEMAN T	75 GOFF AVE	RCRA NonGen / NLR, FINDS, ECHO	Higher	1222, 0.231, NNW
AJ137	WILLIAM E. TOLMAN SR	150 EXCHANGE ST	RI UST	Higher	1224, 0.232, NNE
AK138	AIME & SONS AUTOMOTI	79 GOFF AVE	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	1233, 0.234, NNW
AK139	PROFESSIONAL PLATERS	79 GOFF AVE	RCRA NonGen / NLR, RI MANIFEST	Higher	1233, 0.234, NNW
140	ST. MARY'S CHURCH AN	103 PINE ST	RI UST	Higher	1240, 0.235, WSW
141	LANMAR APARTMENTS -	85 PROSPECT ST	RI UST	Higher	1242, 0.235, East
142	CENTRAL AUTO RADIATO	188 PINE ST	RCRA-SQG, FINDS, ECHO, RI MANIFEST	Higher	1245, 0.236, WNW
AJ143	THOMAS STREET STUDIO	163 EXCHANGE ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	1254, 0.237, NNE
AJ144	MORRIS NATHANSON DES	163 EXCHANGE ST	RI LUST, RI UST	Higher	1254, 0.237, NNE
145	DARLENE JEWELRY MFG	483 MAIN ST	RCRA NonGen / NLR, FINDS, ECHO, NY MANIFEST, RI...	Higher	1271, 0.241, NW
146	TALLMAN ENTERPRISES	44A PINE ST	RCRA NonGen / NLR	Higher	1289, 0.244, SW
AI147	GANSETT AUTO PARTS	206 PINE ST	RCRA-SQG, FINDS, ECHO, RI MANIFEST	Higher	1301, 0.246, NW
AL148	LEROY THEATRE	84 BROAD ST	RI UST	Higher	1301, 0.246, North
AL149	ASBESTOS REMOVAL & C	84 BROAD ST SUITE 21	RCRA NonGen / NLR, FINDS, ECHO	Higher	1301, 0.246, North
AI150	SILES DANA PHOTOGRAP	498 MAIN ST	RCRA NonGen / NLR, FINDS, ECHO, RI MANIFEST	Higher	1308, 0.248, NW
AJ151	PAWTUCKET ARMORY	172 EXCHANGE STREET	RI SHWS, RI AUL, RI BROWNFIELDS	Higher	1327, 0.251, NNE
AJ152	PAWTUCKET ARMORY	172 EXCHANGE STREET	US BROWNFIELDS	Higher	1327, 0.251, NNE
AM153	FOGARTY MANOR APARTM	214 ROOSEVELT AVENUE	RI SHWS	Higher	1335, 0.253, NNE
AI154	MAACO AUTO PAINTING	501 MAIN ST	RCRA-SQG, RI SHWS, RI AUL, FINDS, ECHO, RI...	Higher	1347, 0.255, NW
155	FESTIVAL PIER	SCHOOL STREET	US BROWNFIELDS	Higher	1399, 0.265, SE
156	DENNIS PRINTING COMP	69 MONTGOMERY STREET	RI SHWS, RI AUL	Higher	1403, 0.266, North

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
157	UNION WADDING CO.	125 GOFF AVE	RI LUST, RI AIRS	Higher	1466, 0.278, NNW
AM158	CAROL CABLE (NO FILE	249 ROOSEVELT AVENUE	RI SHWS, RI LUST, RI SPILLS	Higher	1498, 0.284, NNE
159	MIRROR IMAGE INC.	190 EXCHANGE ST	RI LUST, RCRA NonGen / NLR, FINDS, ECHO, RI...	Higher	1517, 0.287, NNE
160	PINE STREET ASSOCIAT	258 PINE STREET	RI SHWS, RI AUL	Higher	1700, 0.322, NW
161	ST RAPHAEL'S ACADEMY	123 WALCOTT STREET	RI LUST	Higher	1795, 0.340, NE
AN162	HARTY REALTY	59 BLACKSTONE AVENUE	RI LUST	Higher	1895, 0.359, NNE
AN163	HARTY REALTY	59-65 BLACKSTONE AVE	RI SHWS, RI AUL	Higher	1895, 0.359, NNE
164	VAZ PROPERTY - HEATI	178 MULBERRY STREET	RI SHWS	Higher	1976, 0.374, WSW
AN165	HARTY REALTY II	70 BLACKSTONE AVENUE	RI SHWS, RI AUL	Higher	1991, 0.377, NNE
AO166	C-TOWN - LOT 539	300 BARTON STREET	US BROWNFIELDS	Higher	2008, 0.380, NNW
AO167	C-TOWN	300 BARTON STREET	RI SHWS, RI BROWNFIELDS	Higher	2008, 0.380, NNW
AO168	C-TOWN - LOT 541	300 BARTON STREET	US BROWNFIELDS, FINDS	Higher	2008, 0.380, NNW
AO169	C-TOWN - LOT 540	300 BARTON STREET	US BROWNFIELDS	Higher	2008, 0.380, NNW
170	CUMBERLAND FARMS #38	193 DIVISION ST	RI LUST, RI UST, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	2034, 0.385, East
171	145 BARTON STREET	145 BARTON STREET	US BROWNFIELDS	Higher	2054, 0.389, NNW
172	76 JEFFERSON AVENUE	76 JEFFERSON AVENUE	US BROWNFIELDS	Higher	2073, 0.393, WSW
173	101 BARTON STREET	101 BARTON STREET	US BROWNFIELDS	Higher	2078, 0.394, North
174	EMERGENCY SHELTER	183 BARTON STREET	RI LUST, RI SPILLS	Higher	2084, 0.395, NNW
AO175	AUTO ZONE	262 BARTON STREET	RI SHWS, RI AUL	Higher	2144, 0.406, NNW
176	MEMORIAL HOSPITAL OF	111 BREWSTER ST	RCRA-SQG, RI LUST, RI UST, ICIS, US AIRS, FINDS,...	Higher	2165, 0.410, East
177	GENERAL FABRICS	45 WASHINGTON STREET	RI LUST	Higher	2255, 0.427, WSW
178	15 JACKSON STREET	15 JACKSON STREET	US BROWNFIELDS	Higher	2261, 0.428, North
179	WOODLAWN SUNOCO SPRI	75 MINERAL SPRING AV	RI LUST	Higher	2285, 0.433, WNW
180	HARMONY MILLS	10 DUNNELL LANE	RI SHWS, RI LUST	Higher	2289, 0.434, SE
181	PAWTUCKET AUTO SUPPL	306 BROAD STREET	RI LUST	Higher	2359, 0.447, North
AP182	PCF 2016 PHASE I - 3	36 MIDDLE STREET	US BROWNFIELDS, FINDS	Higher	2370, 0.449, NNE
AP183	MONETA CAPITAL CORP.	105 FRONT STREET	RI SHWS	Higher	2407, 0.456, NNE
AQ184	TEKNICOTE INC	396 ROOSEVELT AVE	RI SHWS, RI LUST, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	2569, 0.487, North
AR185	COSTA SERVICE	355 BROAD STREET	RI LUST	Higher	2609, 0.494, North
AS186	COLLETTE TRAVEL - 1	164 FRONT STREET	RI SHWS, RI AUL	Higher	2630, 0.498, NNE
AS187	FRONT STREET PARCELS	164 FRONT STREET	US BROWNFIELDS, FINDS	Higher	2630, 0.498, NNE
AQ188	KILMARTIN REALTY	413 ROOSEVELT AVENUE	RI SHWS	Higher	2661, 0.504, North
189	UPTOWN AUTO	50 DUNNELL LANE	RI SHWS	Higher	2674, 0.506, SE
AR190	CHARISMA MANUFACTURI	400 BROAD ST	RI SHWS, RI AUL, RI AIRS	Higher	2789, 0.528, North
AT191	STANDARD UNIFORM	354 PINE ST	RI SHWS, RI LUST, RI UST, RI BROWNFIELDS, RCRA...	Higher	2801, 0.530, NW
AT192	MONARCH BRASS & COPP	371 PINE STREET	RI SHWS	Higher	2865, 0.543, NW
193	PRATA FUNERAL HOME	372 BROADWAY AVE	RI SHWS, RI LUST, RI UST	Higher	2899, 0.549, NNE
AU194	COLLETTE TRAVEL -2	182-210 FRONT STREET	RI SHWS, RI AUL	Higher	2926, 0.554, NNE
AU195	COLLETTE TRAVEL - 3	183 FRONT STREET	RI SHWS	Higher	2942, 0.557, NNE

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
196	NORTH EAST KNITTING	179 CONANT ST	RI SHWS, RI AIRS, RI ASBESTOS	Higher	2975, 0.563, NW
197	LATIMER PROPERTY	618 EAST AVENUE	RI SHWS	Higher	3029, 0.574, SSW
AV198	ART LOFTS - TALLMAN	390 -392 PINE STREET	RI SHWS	Higher	3143, 0.595, NW
199	NAVIGANT CREDIT UNIO	501 ROOSEVELT AVENUE	RI SHWS, RI LUST, RI AUL	Higher	3200, 0.606, North
200	OFFENHAUSER RI /CONT	11 WEBB STREET	RI SHWS, RI AUL	Higher	3263, 0.618, WSW
AV201	PARAMOUNT CARDS	400 PINE STREET	RI SHWS	Higher	3265, 0.618, NW
202	CUMBERLAND FARMS #38	478 BROAD ST	RI SHWS, RI LUST, RI AUL, RCRA NonGen / NLR, US...	Higher	3272, 0.620, North
AW203	SLATER DYE WORKS, IN	700 SCHOOL STREET	RI SHWS, RI AUL	Higher	3282, 0.622, SE
204	FRONT STREET AUTO SA	205 FRONT STREET	RI SHWS, RI SPILLS	Higher	3310, 0.627, NNE
205	CONANT STREET MILL	200 CONANT STREET	RI SHWS, RI AUL	Higher	3341, 0.633, NW
206	SLATER DYE WORKS INC	727 SCHOOL ST	RI SHWS, RI AUL, RCRA NonGen / NLR, ICIS, FINDS,...	Higher	3432, 0.650, SSE
AW207	INTERNATIONAL ACCESS	717 SCHOOL ST	RI SHWS, RI UST, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	3436, 0.651, SSE
208	ELIZABETH WEBBING MI	521 ROOSEVELT AVENUE	RI SHWS, RI LUST, RI AUL, RI SPILLS	Higher	3489, 0.661, North
AX209	PAWTUCKET GAS CO	HIGH STREET	EDR MGP	Higher	3535, 0.670, North
AX210	CASCADE BEVERAGE COM	500 HIGH STREET	RI SHWS, RI LUST, RI AUL	Higher	3536, 0.670, North
211	HEALTH TEX BUILDING	558 ROOSEVELT AVENUE	RI SHWS, RI LUST, RI AUL	Higher	3698, 0.700, North
212	NULCO MFG. CO.	30 BEECHER ST	RI SHWS, RI AUL, RI AIRS	Higher	3742, 0.709, WNW
213	COLLETTE TRAVEL - MI	192 MIDDLE STREET	RI SHWS, RI AUL	Higher	3891, 0.737, NNE
214	EFRAIN PLEITEZ (BANC	502-510 DEXTER STREE	RI SHWS, RI AUL	Higher	3913, 0.741, NNW
215	SLATER SCREEN PRINT	750 SCHOOL ST	RI SHWS, RI AUL, RCRA NonGen / NLR, RI MANIFEST	Higher	3940, 0.746, SSE
AY216	NEW ENGLAND LINE NET	63 BEVERAGE HILL AVE	RI SHWS	Higher	3954, 0.749, SE
217	WOODLAWN LAUNDRY & C	479 WEST AVE	RI SHWS, RCRA NonGen / NLR, RI MANIFEST	Higher	3964, 0.751, SW
218	TRITON FLEET SERVICE	350 WALCOTT ST	RCRA-SQG, RI SHWS, RI AUL, FINDS, ECHO, RI...	Higher	4126, 0.781, ENE
AY219	COMMERCIAL PAINTING,	75 BEVERAGE HILL AVE	RI SHWS, RI AUL	Higher	4127, 0.782, SE
220	DARTMOUTH REALTY	210 DARTMOUTH STREET	RI SHWS	Higher	4150, 0.786, SSW
221	BASF FACILITY	201 ARMISTICE BLVD.	RI SHWS	Higher	4160, 0.788, ENE
222	INTERNATIONAL ROLLIN	81 BEVERAGE HILL AVE	RI SHWS	Higher	4168, 0.789, SE
223	BURNS MANOR	95 PARK ST	RI SHWS, RI ASBESTOS	Higher	4236, 0.802, NNE
224	CRYSTAL TOOL & DIE C	51 CHARLTON AVE	RI SHWS, RCRA NonGen / NLR, RI AIRS, RI MANIFEST	Higher	4269, 0.809, SE
225	RAND STREET COMPLEX	280 RAND STREET	RI SHWS, RI SPILLS	Higher	4471, 0.847, NW
226	T&C WOODWORKING, INC	31 PRIVET ST	RCRA-CESQG, RI SHWS, RI AUL, RI BROWNFIELDS,...	Higher	4474, 0.847, WNW
227	SCHOOLHOUSE CANDY	1005 MAIN ST/75-77 E	RI SHWS	Higher	4656, 0.882, SW
228	RI TEXTILE	400 YORK AVENUE	RI SHWS, RI LUST, RI AUL	Higher	4697, 0.890, ESE
229	AGAR MACHINING & WEL	270 YORK AVE	RCRA-SQG, RI SHWS, FINDS, ECHO, RI MANIFEST	Higher	4723, 0.895, ESE
230	BEACON STREET DISPOS	BEACON & WASHINGTON	RI SHWS	Higher	4801, 0.909, NNW
231	SARGEANT & WILBUR HE	170 YORK AVE	RI SHWS, RCRA NonGen / NLR, FINDS, ECHO, RI...	Higher	4913, 0.930, ESE
AZ232	BRANCH STREET PARCEL	0, 30, 34, 41, 43 AN	RI SHWS, RI BROWNFIELDS	Higher	5060, 0.958, North
AZ233	BRANCH STREET PARCEL	4, 18, 24 BRANCH STR	RI SHWS, RI BROWNFIELDS	Higher	5060, 0.958, North
234	FREIGHT STREET LOT 4	25 FREIGHT STREET	RI SHWS	Higher	5085, 0.963, NE

MAPPED SITES SUMMARY

Target Property Address:
TAFT ST
PAWTUCKET, RI 02860

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
235	MCDONALD'S	839 BROAD STREET	RI SHWS, RI AUL	Higher	5116, 0.969, North
236	U S POSTAL SERVICE	30 MONTICELLO ROAD	RI SHWS	Higher	5169, 0.979, ESE
237	L'HEUREUX PROPERTY	512 YORK AVENUE	RI SHWS	Higher	5182, 0.981, East
238	NARRAGANSETT GROUP	1125 MAIN STREET	RI SHWS, RI AUL, RCRA NonGen / NLR, ICIS, FINDS,...	Higher	5191, 0.983, SW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
TOWN LANDING TAFT STREET PAWTUCKET, RI 02860	US BROWNFIELDS ACRES property ID: 125345	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Federal institutional controls / engineering controls registries

LUCIS ..... Land Use Control Information System
US ENG CONTROLS ..... Engineering Controls Sites List

EXECUTIVE SUMMARY

US INST CONTROL..... Sites with Institutional Controls

Federal ERNS list

ERNS..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

RI SWF/LF..... Solid Waste Management Facilities
RI LCP..... Landfill Closure Program Sites in RI

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
ODI..... Open Dump Inventory
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register
RI CDL..... Clandestine Drug Lab Information Listing
US CDL..... National Clandestine Laboratory Register

Local Land Records

LIENS 2..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS..... Hazardous Materials Information Reporting System
RI SPILLS 90..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS..... Formerly Used Defense Sites
DOD..... Department of Defense Sites
SCRD DRYCLEANERS..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR..... Financial Assurance Information

EXECUTIVE SUMMARY

EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
UXO	Unexploded Ordnance Sites
DOCKET HWC	Hazardous Waste Compliance Docket Listing
FUELS PROGRAM	EPA Fuels Program Registered Listing
RI Financial Assurance	Financial Assurance Information
RI LEAD	Lead Inspections Database
RI NPDES	Permit and Facility Data

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto	EDR Exclusive Historical Auto Stations

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RI RGA HWS	Recovered Government Archive State Hazardous Waste Facilities List
RI RGA LF	Recovered Government Archive Solid Waste Facilities List
RI RGA LUST	Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

SEMS: SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the SEMS list, as provided by EDR, and dated 04/11/2019 has revealed that there is 1 SEMS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TIDEWATER COAL GASSI Site ID: 0101413 EPA Id: RID981885106	OFF TIDEWATER AVENUE	SSE 0 - 1/8 (0.013 mi.)	B9	38

Federal RCRA generators list

RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

A review of the RCRA-LQG list, as provided by EDR, and dated 03/25/2019 has revealed that there is 1 RCRA-LQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
C V S #2234 EPA ID:: RIR000500157	***425 EAST AVE***	***SSW 1/8 - 1/4 (0.199 mi.)***	***AF113***	***325***

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 03/25/2019 has revealed that there are 12 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
APEX AUTOMOTIVE SERV	***1 SCHOOL ST***	***NNE 0 - 1/8 (0.061 mi.)***	***I29***	***71***

EPA ID:: RID987470606				
MR USA 1 HOUR CLEANE EPA ID:: RID980909345	***224 EAST AVE***	***WSW 0 - 1/8 (0.089 mi.)***	***K37***	***120***
BLACKSTONE VALLEY CO EPA ID:: RI5000001032	***42 PARK PLACE***	***NNW 0 - 1/8 (0.121 mi.)***	***P52***	***162***
LAPRADE ANDRE J DMD EPA ID:: RIR000504068	123 SCHOOL ST	ENE 1/8 - 1/4 (0.158 mi.)	Q77	204
PHOTOPOULOS D JAMES EPA ID:: RID987475829	***123 SCHOOL ST***	***ENE 1/8 - 1/4 (0.158 mi.)***	***Q78***	***206***
PHOTOPOULOS D JAMES EPA ID:: RID987486214	***123 SCHOOL ST***	***ENE 1/8 - 1/4 (0.158 mi.)***	***Q79***	***217***
SUNOCO SERVICE STA EPA ID:: RID000843656	***35 CEDAR ST***	***WNW 1/8 - 1/4 (0.174 mi.)***	***Y92***	***247***
JOE'S CEDAR STREET S EPA ID:: RID987470374	***71 CEDAR ST & PINE***	***WNW 1/8 - 1/4 (0.216 mi.)***	***Y121***	***357***
R I MEDICAL IMAGING EPA ID:: RID982543944	***333 SCHOOL ST***	***SE 1/8 - 1/4 (0.229 mi.)***	***AE133***	***402***
SILVERMAN ANDREW B D EPA ID:: RIR000506733	***333 SCHOOL ST STE 20***	***SE 1/8 - 1/4 (0.229 mi.)***	***AE134***	***412***
CENTRAL AUTO RADIATO EPA ID:: RID987486867	***188 PINE ST***	***WNW 1/8 - 1/4 (0.236 mi.)***	***142***	***441***
GANSETT AUTO PARTS EPA ID:: RID987478468	***206 PINE ST***	***NW 1/8 - 1/4 (0.246 mi.)***	***AI147***	***468***

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 03/25/2019 has revealed that there are 2 RCRA-CESQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BLACKSTONE VALLEY CO EPA ID:: RIR000517367	30 EAST AVENUE, SUIT	N 0 - 1/8 (0.013 mi.)	A8	34
CVI PAWTUCKET EPA ID:: RIR000517417	407 EAST AVENUE	SSW 1/8 - 1/4 (0.182 mi.)	W98	266

State- and tribal - equivalent CERCLIS

RI SHWS: This list includes sites that have been investigated under the Federal CERCLIS program (SFA sites) as well as sites that have notified under the state program or have been investigated for hazardous substances (HWM sites).

A review of the RI SHWS list, as provided by EDR, and dated 01/16/2019 has revealed that there are 85

EXECUTIVE SUMMARY

RI SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PET FOOD EXPERTS LLC Facility Status: Active Project Code: PFEL-HWM Siterem Site Number: SR-26-1750	***175 MAIN STREET***	***0 - 1/8 (0.000 mi.)***	***A2***	***18***
SOVEREIGN BANK Facility Status: Inactive Project Code: SOVE-HWM Siterem Site Number: SR-26-1457	***210 MAIN STREET***	***N 0 - 1/8 (0.017 mi.)***	***A10***	***40***
TIDEWATER COAL GASSI Facility Status: Active Project Code: TWC-SFA Project Code: TWC-HWM Siterem Site Number: SR-26-0934 B Siterem Site Number: SR-26-0934 A	TIDEWATER STREET	SSE 0 - 1/8 (0.030 mi.)	B20	56
SLATER MILL WALL REP Facility Status: Active Project Code: SMPL-HWM Project Code: BRSM-HWM Siterem Site Number: SR-26-1919 Siterem Site Number: SR-26-1706	67 ROOSEVELT AVENUE	NNE 0 - 1/8 (0.037 mi.)	22	56
LAWN TERRACE APARTME Facility Status: Inactive Project Code: LAWN-HWM Siterem Site Number: SR-26-0933	***180-226 PLEASANT ST***	***SW 0 - 1/8 (0.038 mi.)***	***F23***	***57***
MERCHANTS TIRE Facility Status: Inactive Project Code: TPRO-HWM Siterem Site Number: SR-26-1540	***21 DIVISION ST***	***E 0 - 1/8 (0.078 mi.)***	***H33***	***83***
APEX INC Facility Status: Inactive Project Code: APEX1-HWM Siterem Site Number: SR-26-1710 A	***100 MAIN ST***	***NE 0 - 1/8 (0.087 mi.)***	***35***	***105***
WEINBERG COMMERCIAL Facility Status: Inactive Project Code: WCP2-HWM Siterem Site Number: SR-26-1789 B	***26 SUMMER STREET***	***N 1/8 - 1/4 (0.132 mi.)***	***R59***	***173***
PILAVIN PROPERTIES, Facility Status: Active Project Code: PPLP-HWM Siterem Site Number: SR-26-1812	33 MAIN STREET	NE 1/8 - 1/4 (0.132 mi.)	S60	174
ST GEORGE'S CHURCH (Facility Status: Inactive Project Code: SGEO-HWM Siterem Site Number: SR-26-1468	***46 MAIN STREET***	***NE 1/8 - 1/4 (0.134 mi.)***	***S61***	***174***
APEX DEVELOPMENT 2 - Facility Status: Inactive Project Code: APEX2-HWM Siterem Site Number: SR-26-1710 B	***10 SCHOOL STREET***	***NE 1/8 - 1/4 (0.140 mi.)***	***66***	***176***
VIKING CHEVROLET GEO	***45-55 DIVISION ST***	***ESE 1/8 - 1/4 (0.148 mi.)***	***U70***	***179***

Facility Status: Active Project Code: DSHL-HWM Siterem Site Number: SR-26-0422				
PAWTUCKET LAYOVER FA Facility Status: Active Project Code: PALF-DOT Siterem Site Number: SR-26-1310	PLAT 59 & 61, LOT 22	SW 1/8 - 1/4 (0.157 mi.)	M75	204
PHOTOPOULOS D JAMES Facility Status: Inactive Project Code: PABA-HWM Siterem Site Number: SR-26-1076	***123 SCHOOL ST***	***ENE 1/8 - 1/4 (0.158 mi.)***	***Q78***	***206***
VARIEUR ELEMENTARY S Facility Status: Inactive Project Code: VAR-NJD Siterem Site Number: NJD-26-86	468 PLEASANT STREET	S 1/8 - 1/4 (0.160 mi.)	81	227
DR. GOLF (SEE NJD-26 Facility Status: Inactive Project Code: DRG-NJD Project Code: DRG-TBA Project Code: DRG-SUBC Siterem Site Number: NJD-26-0082 Siterem Site Number: SR-26-0388	***100 TIM HEALEY WAY***	***SE 1/8 - 1/4 (0.191 mi.)***	***AE110***	***323***
NATIONAL GRID - VAUL Facility Status: Inactive Project Code: NE355-HWM Siterem Site Number: SR-26-0946	GOFF & BROAD STREET	N 1/8 - 1/4 (0.195 mi.)	X112	325
PARKIN YARN (FORMER) Facility Status: Inactive Project Code: PARY-HWM Siterem Site Number: SR-26-1063	***21 COMMERCE STREET***	***NNW 1/8 - 1/4 (0.208 mi.)***	***AB116***	***354***
CENTENIAL TOWERS Facility Status: Inactive Project Code: CENT-HWM Siterem Site Number: SR-26-0228	***35 GOFF STREET***	***NNW 1/8 - 1/4 (0.210 mi.)***	***X117***	***355***
ROOSEVELT AVENUE DIS Facility Status: Inactive Project Code: ROO-HWM Siterem Site Number: SR-26-1284	ROOSEVELT AVENUE	NNE 1/8 - 1/4 (0.212 mi.)	118	355
PAWTUCKET ARMORY Facility Status: Inactive Project Code: PAWA-HWM Project Code: PAWA-RLF Siterem Site Number: SR-26-1075	***172 EXCHANGE STREET***	***NNE 1/4 - 1/2 (0.251 mi.)***	***AJ151***	***491***
FOGARTY MANOR APARTM Facility Status: Inactive Project Code: FMAC-HWM Siterem Site Number: SR-26-1749	214 ROOSEVELT AVENUE	NNE 1/4 - 1/2 (0.253 mi.)	AM153	518
MAACO AUTO PAINTING Facility Status: Inactive Project Code: MACO-HWM Siterem Site Number: SR-26-0768	***501 MAIN ST***	***NW 1/4 - 1/2 (0.255 mi.)***	***AI154***	***519***
DENNIS PRINTING COMP	***69 MONTGOMERY STREET***	***N 1/4 - 1/2 (0.266 mi.)***	***156***	***557***

Facility Status: Inactive Project Code: DENP-HWM Siterem Site Number: SR-26-0369				
CAROL CABLE (NO FILE	***249 ROOSEVELT AVENUE***	***NNE 1/4 - 1/2 (0.284 mi.)***	***AM158***	***559***
Facility Status: Inactive Project Code: CCPA-HWM Siterem Site Number: SR-26-0222				
PINE STREET ASSOCIAT	***258 PINE STREET***	***NW 1/4 - 1/2 (0.322 mi.)***	***160***	***571***
Facility Status: Active Project Code: PINE-HWM Siterem Site Number: SR-26-1109				
HARTY REALTY	***59-65 BLACKSTONE AVE***	***NNE 1/4 - 1/2 (0.359 mi.)***	***AN163***	***572***
Facility Status: Active Project Code: HARR-HWM Siterem Site Number: SR-26-0591 A				
VAZ PROPERTY - HEATI	178 MULBERRY STREET	WSW 1/4 - 1/2 (0.374 mi.)	164	573
Facility Status: Active Project Code: VPHOS-HWM Siterem Site Number: SR-26-1619				
HARTY REALTY II	***70 BLACKSTONE AVENUE***	***NNE 1/4 - 1/2 (0.377 mi.)***	***AN165***	***573***
Facility Status: Active Project Code: HAR2-HWM Siterem Site Number: SR-26-0591 B				
C-TOWN	***300 BARTON STREET***	***NNW 1/4 - 1/2 (0.380 mi.)***	***AO167***	***583***
Facility Status: Active Project Code: CTN-SUBC Siterem Site Number: SR-26-0322 B				
AUTO ZONE	***262 BARTON STREET***	***NNW 1/4 - 1/2 (0.406 mi.)***	***AO175***	***616***
Facility Status: Active Project Code: AUTOZ-HWM Siterem Site Number: SR-26-0322 A				
HARMONY MILLS	***10 DUNNELL LANE***	***SE 1/4 - 1/2 (0.434 mi.)***	***180***	***671***
Facility Status: Inactive Project Code: HARM-HWM Siterem Site Number: SR-26-0583				
MONETA CAPITAL CORP.	105 FRONT STREET	NNE 1/4 - 1/2 (0.456 mi.)	AP183	675
Facility Status: Inactive Project Code: MOCA-HWM Siterem Site Number: SR-26-0835				
TEKNICOTE INC	***396 ROOSEVELT AVE***	***N 1/4 - 1/2 (0.487 mi.)***	***AQ184***	***675***
Facility Status: Monitoring Project Code: RAR-HWM Siterem Site Number: SR-04-1850				
COLLETTE TRAVEL - 1	***164 FRONT STREET***	***NNE 1/4 - 1/2 (0.498 mi.)***	***AS186***	***686***
Facility Status: Inactive Project Code: COL1-HWM Siterem Site Number: SR-26-0276 A				
KILMARTIN REALTY	413 ROOSEVELT AVENUE	N 1/2 - 1 (0.504 mi.)	AQ188	690
Facility Status: Active Project Code: KILM-HWM Siterem Site Number: SR-04-0704				
UPTOWN AUTO	50 DUNNELL LANE	SE 1/2 - 1 (0.506 mi.)	189	690

Facility Status: Inactive Project Code: UPTO-HWM Siterem Site Number: SR-26-1609				
CHARISMA MANUFACTURI Facility Status: Inactive Project Code: FDP-HWM Siterem Site Number: SR-04-1753	***400 BROAD ST***	***N 1/2 - 1 (0.528 mi.)***	***AR190***	***690***
STANDARD UNIFORM Facility Status: Active Project Code: STAN-SUBC Project Code: STAN-HWM Siterem Site Number: SR-26-1472	***354 PINE ST***	***NW 1/2 - 1 (0.530 mi.)***	***AT191***	***694***
MONARCH BRASS & COPP Facility Status: Inactive Project Code: MOBC-NJD Siterem Site Number: NJD-26-0027	371 PINE STREET	NW 1/2 - 1 (0.543 mi.)	AT192	705
PRATA FUNERAL HOME Facility Status: Inactive Project Code: PRFH-HWM Siterem Site Number: SR-26-1132	***372 BROADWAY AVE***	***NNE 1/2 - 1 (0.549 mi.)***	***193***	***705***
COLLETTE TRAVEL -2 Facility Status: Inactive Project Code: COL2-HWM Siterem Site Number: SR-26-0276 C	***182-210 FRONT STREET***	***NNE 1/2 - 1 (0.554 mi.)***	***AU194***	***706***
COLLETTE TRAVEL - 3 Facility Status: Active Project Code: COL3-HWM Siterem Site Number: SR-26-1785	183 FRONT STREET	NNE 1/2 - 1 (0.557 mi.)	AU195	706
NORTH EAST KNITTING Facility Status: Inactive Project Code: GLNF-HWM Siterem Site Number: SR-26-0542	***179 CONANT ST***	***NW 1/2 - 1 (0.563 mi.)***	***196***	***707***
LATIMER PROPERTY Facility Status: Inactive Project Code: LATI-HWM Siterem Site Number: SR-18-0728	618 EAST AVENUE	SSW 1/2 - 1 (0.574 mi.)	197	710
ART LOFTS - TALLMAN Facility Status: Active Project Code: ART-HWM Siterem Site Number: SR-26-0073	390 -392 PINE STREET	NW 1/2 - 1 (0.595 mi.)	AV198	710
NAVIGANT CREDIT UNIO Facility Status: Inactive Project Code: NCUP-HWM Siterem Site Number: SR-04-0133	***501 ROOSEVELT AVENUE***	***N 1/2 - 1 (0.606 mi.)***	***199***	***710***
OFFENHAUSER RI /CONT Facility Status: Active Project Code: OFFH-HWM Siterem Site Number: SR-26-1036	***11 WEBB STREET***	***WSW 1/2 - 1 (0.618 mi.)***	***200***	***711***
PARAMOUNT CARDS Facility Status: Inactive Project Code: PCAR-HWM	400 PINE STREET	NW 1/2 - 1 (0.618 mi.)	AV201	711

Siterem Site Number: SR-26-1059				
CUMBERLAND FARMS #38 Facility Status: Active Project Code: CFBS-HWM Siterem Site Number: SR-04-1758	***478 BROAD ST***	***N 1/2 - 1 (0.620 mi.)***	***202***	***712***
SLATER DYE WORKS, IN Facility Status: Inactive Project Code: SDWI-HWM Siterem Site Number: SR-26-1441 A	***700 SCHOOL STREET***	***SE 1/2 - 1 (0.622 mi.)***	***AW203***	***723***
FRONT STREET AUTO SA Facility Status: Inactive Project Code: FSAS-HWM Siterem Site Number: SR-26-0502	***205 FRONT STREET***	***NNE 1/2 - 1 (0.627 mi.)***	***204***	***723***
CONANT STREET MILL Facility Status: Inactive Project Code: COSM-HWM Siterem Site Number: SR-26-0284 A	***200 CONANT STREET***	***NW 1/2 - 1 (0.633 mi.)***	***205***	***724***
SLATER DYE WORKS INC Facility Status: Inactive Project Code: SDW2-HWM Siterem Site Number: SR-26-1441 B	***727 SCHOOL ST***	***SSE 1/2 - 1 (0.650 mi.)***	***206***	***724***
INTERNATIONAL ACCESS Facility Status: Active Project Code: IPC-HWM Siterem Site Number: SR-26-1857	***717 SCHOOL ST***	***SSE 1/2 - 1 (0.651 mi.)***	***AW207***	***737***
ELIZABETH WEBBING MI Facility Status: Active Project Code: EWM-HWM Siterem Site Number: SR-04-0432	***521 ROOSEVELT AVENUE***	***N 1/2 - 1 (0.661 mi.)***	***208***	***742***
CASCADE BEVERAGE COM Facility Status: Inactive Project Code: CBC-HWM Siterem Site Number: SR-04-0230	***500 HIGH STREET***	***N 1/2 - 1 (0.670 mi.)***	***AX210***	***743***
HEALTH TEX BUILDING Facility Status: Inactive Project Code: HTB-HWM Siterem Site Number: SR-04-0597	***558 ROOSEVELT AVENUE***	***N 1/2 - 1 (0.700 mi.)***	***211***	***743***
NULCO MFG. CO. Facility Status: Inactive Project Code: NULC-HWM Siterem Site Number: SR-26-1026	***30 BEECHER ST***	***WNW 1/2 - 1 (0.709 mi.)***	***212***	***744***
COLLETTE TRAVEL - MI Facility Status: Inactive Project Code: COLM-HWM Siterem Site Number: SR-26-0276 B	***192 MIDDLE STREET***	***NNE 1/2 - 1 (0.737 mi.)***	***213***	***748***
EFRAIN PLEITEZ (BANC Facility Status: Inactive Project Code: EFRP-HWM Siterem Site Number: SR-04-0425	***502-510 DEXTER STREE***	***NNW 1/2 - 1 (0.741 mi.)***	***214***	***749***
SLATER SCREEN PRINT	***750 SCHOOL ST***	***SSE 1/2 - 1 (0.746 mi.)***	***215***	***749***

Facility Status: Inactive Project Code: SLSP-HWM Siterem Site Number: SR-26-1443				
NEW ENGLAND LINE NET Facility Status: Active Project Code: NELN-HWM Siterem Site Number: SR-26-1908	63 BEVERAGE HILL AVE	SE 1/2 - 1 (0.749 mi.)	AY216	759
WOODLAWN LAUNDRY & C Facility Status: Inactive Project Code: WLCL-HWM Siterem Site Number: SR-26-1688	***479 WEST AVE***	***SW 1/2 - 1 (0.751 mi.)***	***217***	***759***
TRITON FLEET SERVICE Facility Status: Inactive Project Code: MONA-HWM Siterem Site Number: SR-26-0832	***350 WALCOTT ST***	***ENE 1/2 - 1 (0.781 mi.)***	***218***	***769***
COMMERCIAL PAINTING, Facility Status: Inactive Project Code: CPI-HWM Siterem Site Number: SR-26-0279	***75 BEVERAGE HILL AVE***	***SE 1/2 - 1 (0.782 mi.)***	***AY219***	***782***
DARTMOUTH REALTY Facility Status: Inactive Project Code: DRE-HWM Siterem Site Number: SR-26-0346	210 DARTMOUTH STREET	SSW 1/2 - 1 (0.786 mi.)	220	783
BASF FACILITY Facility Status: Active Project Code: BASF-HWM Siterem Site Number: SR-26-0105	201 ARMISTICE BLVD.	ENE 1/2 - 1 (0.788 mi.)	221	783
INTERNATIONAL ROLLIN Facility Status: Active Project Code: IRM-HWM Siterem Site Number: SR-26-0321 B	81 BEVERAGE HILL AVE	SE 1/2 - 1 (0.789 mi.)	222	783
BURNS MANOR Facility Status: Inactive Project Code: 95PS-HWM Siterem Site Number: SR-26-1886	***95 PARK ST***	***NNE 1/2 - 1 (0.802 mi.)***	***223***	***784***
CRYSTAL TOOL & DIE C Facility Status: Active Project Code: CRYS-HWM Siterem Site Number: SR-26-0321 A	***51 CHARLTON AVE***	***SE 1/2 - 1 (0.809 mi.)***	***224***	***784***
RAND STREET COMPLEX Facility Status: Active Project Code: RAND-HWM Siterem Site Number: SR-04-1206	***280 RAND STREET***	***NW 1/2 - 1 (0.847 mi.)***	***225***	***795***
T&C WOODWORKING, INC Facility Status: Inactive Project Code: PRIV-HWM Project Code: PRI-SUBC Siterem Site Number: SR-26-1137 A Siterem Site Number: SR-26-1137 B	***31 PRIVET ST***	***WNW 1/2 - 1 (0.847 mi.)***	***226***	***795***
SCHOOLHOUSE CANDY Facility Status: Active	1005 MAIN ST/75-77 E	SW 1/2 - 1 (0.882 mi.)	227	809

Project Code: SCHC-HWM Siterem Site Number: SR-26-1407				
RI TEXTILE Facility Status: Inactive Project Code: RIT-HWM Siterem Site Number: SR-26-1159	***400 YORK AVENUE***	***ESE 1/2 - 1 (0.890 mi.)***	***228***	***809***
AGAR MACHINING & WEL Facility Status: Inactive Project Code: SSPC-NJD Siterem Site Number: NJD-26-0047	***270 YORK AVE***	***ESE 1/2 - 1 (0.895 mi.)***	***229***	***809***
BEACON STREET DISPOS Facility Status: Inactive Project Code: BSD-HWM Siterem Site Number: SR-04-0111	BEACON & WASHINGTON	NNW 1/2 - 1 (0.909 mi.)	230	820
SARGEANT & WILBUR HE Facility Status: Inactive Project Code: GPRO-HWM Siterem Site Number: SR-26-0516	***170 YORK AVE***	***ESE 1/2 - 1 (0.930 mi.)***	***231***	***820***
BRANCH STREET PARCEL Facility Status: Active Project Code: BSP-HWM Project Code: BSP-SUBC Siterem Site Number: SR-26-0155 A Siterem Site Number: SR-26-0155 B	***0, 30, 34, 41, 43 AN***	***N 1/2 - 1 (0.958 mi.)***	***AZ232***	***824***
BRANCH STREET PARCEL Facility Status: Active Project Code: BSP2-SUBC Siterem Site Number: SR-26-0155 C	***4, 18, 24 BRANCH STR***	***N 1/2 - 1 (0.958 mi.)***	***AZ233***	***825***
FREIGHT STREET LOT 4 Facility Status: Active Project Code: FSL4-HWM Siterem Site Number: SR-26-1927	25 FREIGHT STREET	NE 1/2 - 1 (0.963 mi.)	234	825
MCDONALD'S Facility Status: Inactive Project Code: MDON-HWM Siterem Site Number: SR-04-0797	***839 BROAD STREET***	***N 1/2 - 1 (0.969 mi.)***	***235***	***826***
U S POSTAL SERVICE Facility Status: Inactive Project Code: USPS-HWM Siterem Site Number: SR-26-1611	30 MONTICELLO ROAD	ESE 1/2 - 1 (0.979 mi.)	236	826
L'HEUREUX PROPERTY Facility Status: Inactive Project Code: LHP-HWM Siterem Site Number: SR-26-0739	512 YORK AVENUE	E 1/2 - 1 (0.981 mi.)	237	826
NARRAGANSETT GROUP Facility Status: Inactive Project Code: NARW-HWM Siterem Site Number: SR-26-0909 B	***1125 MAIN STREET***	***SW 1/2 - 1 (0.983 mi.)***	***238***	***827***

State and tribal leaking storage tank lists

RI LUST: The LUST Case List is a summary of UST Facilities in RI with leaking USTs, which includes information on the date of release discovery and the status of the LUST Case (active, soil removal only, or inactive).

A review of the RI LUST list, as provided by EDR, and dated 12/26/2018 has revealed that there are 26 RI LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ADAMS FURNITURE	65 EAST AVENUE	N 0 - 1/8 (0.022 mi.)	E17	55
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required Facility Id: 19135 Project Number: 2695-ST				
YOUNG MEN CHRISTIAN	20 SUMMER STREET	N 0 - 1/8 (0.116 mi.)	J46	149
Facility Status: Soil Removal Only; No Further Action Required Facility Id: 16935 Project Number: 2630-LS				
VIKING CHEVROLET GEO	***45-55 DIVISION ST***	***ESE 1/8 - 1/4 (0.148 mi.)***	***U70***	***179***
Facility Status: Soil Removal Only; No Further Action Required Facility Id: 18524 Project Number: 2671-ST				
TOLMAN HIGH SCHOOL	EXCHANGE STREET	NNE 1/8 - 1/4 (0.159 mi.)	V80	227
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required Facility Id: 1425 Project Number: 2639-ST				
SUNOCO STATION	35 CEDAR STREET	WNW 1/8 - 1/4 (0.174 mi.)	Y90	245
Facility Status: Active; Investigation/Remed. Required Facility Id: 620 Project Number: 2605-LS				
SUNOCO SERVICE STA	***81 SCHOOL ST***	***ENE 1/8 - 1/4 (0.184 mi.)***	***AC102***	***290***
Facility Status: Soil Removal Only; No Further Action Required Facility Id: 621 Project Number: 2607-LS				
THE PAWTUCKET SPOT	***72 EXCHANGE ST***	***N 1/8 - 1/4 (0.190 mi.)***	***107***	***317***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required Facility Id: 1828 Project Number: 2673-LS				
SHELL STATION	71 CEDAR STREET	WNW 1/8 - 1/4 (0.216 mi.)	Y120	357
Facility Status: Active; Investigation/Remed. Required Facility Id: 808 Project Number: 26105-LS				
TEXACO STATION	GOFF AVENUE & DEXTER	NNW 1/8 - 1/4 (0.217 mi.)	AG123	367
Facility Status: Soil Removal Only; No Further Action Required Facility Id: 544 Project Number: 2601-LS				
HASKELL WILLIAM H MF	***24 COMMERCE ST***	***NNW 1/8 - 1/4 (0.218 mi.)***	***AH124***	***367***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required Facility Id: 19 Project Number: 2648A-ST Project Number: 2648-LS				
GEORGE H FULLER AND	***151 EXCHANGE ST***	***NNE 1/8 - 1/4 (0.222 mi.)***	***AJ128***	***387***

Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 4534
Project Number: 26111-ST

MORRIS NATHANSON DES ***163 EXCHANGE ST*** ***NNE 1/8 - 1/4 (0.237 mi.)*** ***AJ144*** ***452***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 18259
Project Number: 2663-ST

UNION WADDING CO. ***125 GOFF AVE*** ***NNW 1/4 - 1/2 (0.278 mi.)*** ***157*** ***558***
Facility Status: Soil Removal Only; No Further Action Required
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 10
Project Number: 26107A-ST
Project Number: 26107-ST

CAROL CABLE (NO FILE ***249 ROOSEVELT AVENUE*** ***NNE 1/4 - 1/2 (0.284 mi.)*** ***AM158*** ***559***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 18518
Project Number: 2650-ST

MIRROR IMAGE INC. ***190 EXCHANGE ST*** ***NNE 1/4 - 1/2 (0.287 mi.)*** ***159*** ***560***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 18539
Project Number: 2662-LS

ST RAPHAEL'S ACADEMY 123 WALCOTT STREET NE 1/4 - 1/2 (0.340 mi.) 161 572
Facility Status: Soil Removal Only; No Further Action Required
Facility Id: 3638
Project Number: 2629-ST

HARTY REALTY 59 BLACKSTONE AVENUE NNE 1/4 - 1/2 (0.359 mi.) AN162 572
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 4033
Project Number: 26102-LS

CUMBERLAND FARMS #38 ***193 DIVISION ST*** ***E 1/4 - 1/2 (0.385 mi.)*** ***170*** ***597***
Facility Status: Soil Removal Only; No Further Action Required
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 779
Project Number: 2672A-LS
Project Number: 2672-LS

EMERGENCY SHELTER ***183 BARTON STREET*** ***NNW 1/4 - 1/2 (0.395 mi.)*** ***174*** ***616***
Facility Status: Soil Removal Only; No Further Action Required
Facility Id: 16669
Project Number: 2621-LS

MEMORIAL HOSPITAL OF ***111 BREWSTER ST*** ***E 1/4 - 1/2 (0.410 mi.)*** ***176*** ***617***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 3420
Project Number: 26110-ST

GENERAL FABRICS 45 WASHINGTON STREET WSW 1/4 - 1/2 (0.427 mi.) 177 668
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 18538
Project Number: 2667-ST

WOODLAWN SUNOCO SPRI 75 MINERAL SPRING AV WNW 1/4 - 1/2 (0.433 mi.) 179 671
Facility Status: Soil Removal Only; No Further Action Required
Facility Id: 3032
Project Number: 2678-LS

HARMONY MILLS ***10 DUNNELL LANE*** ***SE 1/4 - 1/2 (0.434 mi.)*** ***180*** ***671***

Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 16688
Project Number: 2625-ST

PAWTUCKET AUTO SUPPL	306 BROAD STREET	N 1/4 - 1/2 (0.447 mi.)	181	672

Facility Status: Soil Removal Only; No Further Action Required
Facility Id: 19212
Project Number: 0416-ST

TEKNICOTE INC	***396 ROOSEVELT AVE***	***N 1/4 - 1/2 (0.487 mi.)***	***AQ184***	***675***

Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 2511
Project Number: 0415-ST

COSTA SERVICE	355 BROAD STREET	N 1/4 - 1/2 (0.494 mi.)	AR185	686

Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required
Facility Id: 3160
Project Number: 0408-LS

State and tribal registered storage tank lists

RI UST: The UST Master List is a summary of registered UST Facilities in RI, which includes information on abandoned, in use, permanently closed and temporarily closed USTs.

A review of the RI UST list, as provided by EDR, and dated 12/26/2018 has revealed that there are 67 RI UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NEW ENGLAND TELEPHON	2 PLEASANT ST	N 0 - 1/8 (0.011 mi.)	C5	30

Facility Id: UST-1774
Tank Status: Permanently Closed

S. PAPADOPOULO & K.	30 EAST AVE	N 0 - 1/8 (0.013 mi.)	A6	31

Facility Id: UST-2607
Tank Status: Permanently Closed

COMMERCIAL PROPERTY	40 EAST AVE	N 0 - 1/8 (0.018 mi.)	A11	41

Facility Id: UST-4527
Tank Status: Permanently Closed

REGAL CAR CARE	65 EAST ST	N 0 - 1/8 (0.022 mi.)	E15	54

Facility Id: UST-1926
Tank Status: Permanently Closed

ADAMS FURNITURE	65 EAST AVE	N 0 - 1/8 (0.022 mi.)	E16	54

Facility Id: UST-19135
Tank Status: Permanently Closed

VITALI PROPERTY	216 MAIN ST	N 0 - 1/8 (0.024 mi.)	A18	55

Facility Id: UST-19046
Tank Status: Permanently Closed

SHOVE INSURANCE REAL	100 EAST AVE	NNW 0 - 1/8 (0.027 mi.)	C19	55

Facility Id: UST-18640
Tank Status: Permanently Closed

VALLEY GAS COMPANY	TIDEWATER ST	SSE 0 - 1/8 (0.030 mi.)	B21	56

Facility Id: UST-17141

Tank Status: Permanently Closed				
LAWN TERRACE APARTME	***180-226 PLEASANT ST***	***SW 0 - 1/8 (0.038 mi.)***	***F23***	***57***
Facility Id: UST-1540 Tank Status: Permanently Closed				
COMMERCIAL PROPERTY	228-230 MAIN ST	N 0 - 1/8 (0.039 mi.)	G24	58
Facility Id: UST-19250 Tank Status: Permanently Closed				
BLACKSTONE VALLEY EL	MERRY ST	SSE 0 - 1/8 (0.047 mi.)	25	58
Facility Id: UST-568 Tank Status: Permanently Closed				
RIDOT - 20 DIVISION	20 DIVISION ST	ENE 0 - 1/8 (0.052 mi.)	H27	70
Facility Id: UST-4741 Tank Status: Permanently Closed Tank Status: Abandoned				
E & A TAVERN	25 PAWTUCKET AVE	WSW 0 - 1/8 (0.053 mi.)	F28	70
Facility Id: UST-4222 Tank Status: Permanently Closed				
APEX DEVELOPMENT CO.	1 SCHOOL ST	NNE 0 - 1/8 (0.061 mi.)	I30	81
Facility Id: UST-16081 Tank Status: Permanently Closed				
COMMERCIAL PROPERTY	250 MAIN ST	N 0 - 1/8 (0.073 mi.)	G32	83
Facility Id: UST-18945 Tank Status: Permanently Closed				
MERCHANTS TIRE	***21 DIVISION ST***	***E 0 - 1/8 (0.078 mi.)***	***H33***	***83***
Facility Id: UST-15769 Tank Status: Permanently Closed				
COMMERCIAL OFFICE BU	225 EAST AVE	WSW 0 - 1/8 (0.096 mi.)	K40	147
Facility Id: UST-18261 Tank Status: Permanently Closed				
MANNING-HEFFRON FUNE	68 BROADWAY	NNE 0 - 1/8 (0.106 mi.)	L41	148
Facility Id: UST-16653 Tank Status: Permanently Closed				
PARTY WAREHOUSE	310 EAST AVE	SW 0 - 1/8 (0.110 mi.)	M42	148
Facility Id: UST-15193 Tank Status: Permanently Closed				
CREST PHOTO LABS	324 EAST AVE	SSW 0 - 1/8 (0.112 mi.)	M43	148
Facility Id: UST-15660 Tank Status: Permanently Closed				
LANTAU ISLAND, INC.	286 MAIN ST	N 0 - 1/8 (0.112 mi.)	N44	149
Facility Id: UST-188 Tank Status: Permanently Closed				
YMCA	20 SUMMER ST	N 0 - 1/8 (0.116 mi.)	J45	149
Facility Id: UST-16935 Tank Status: Permanently Closed				
DISPLAY CREATIONS	93 PARK PL	NNW 0 - 1/8 (0.118 mi.)	O47	150
Facility Id: UST-1429 Tank Status: Permanently Closed				
ST. PAUL'S EPISCOPAL	50 PARK PL	NNW 0 - 1/8 (0.119 mi.)	P48	150
Facility Id: UST-18769				

Tank Status: Permanently Closed				
VERIZON NEW ENGLAND, Facility Id: UST-1204 Tank Status: In Use Tank Status: Permanently Closed	85 HIGH ST	N 0 - 1/8 (0.119 mi.)	J50	161
JAMES CORDANO Facility Id: UST-16538 Tank Status: Permanently Closed	36 PARK PL	NNW 0 - 1/8 (0.120 mi.)	P51	161
BLACKSTONE VALLEY CO Facility Id: UST-15893 Tank Status: Permanently Closed	42 PARK PL	NNW 0 - 1/8 (0.121 mi.)	P53	170
LANTAU, INC. PROPERT Facility Id: UST-4027 Tank Status: Permanently Closed	298 MAIN ST	NNW 0 - 1/8 (0.123 mi.)	N54	171
NORTHERN PLAZA Facility Id: UST-3346 Tank Status: Permanently Closed	301 MAIN ST	NNW 0 - 1/8 (0.125 mi.)	N55	171
PRESERVATION SOCIETY Facility Id: UST-18940 Tank Status: Permanently Closed	67 PARK PL	NNW 1/8 - 1/4 (0.131 mi.)	O58	173
PAWTUCKET CONGREGATI Facility Id: UST-4286 Tank Status: Permanently Closed	40 WALCOTT ST	NE 1/8 - 1/4 (0.136 mi.)	L62	175
SALVATION ARMY -- PA Facility Id: UST-4653 Tank Status: Permanently Closed	102 HIGH ST	N 1/8 - 1/4 (0.137 mi.)	T63	175
OLD MONTGOMERY DISTR Facility Id: UST-15593 Tank Status: Permanently Closed	100 BROADWAY	NE 1/8 - 1/4 (0.138 mi.)	L64	175
LARRY SHUSHANSKI RES Facility Id: UST-4274 Tank Status: Permanently Closed	351 EAST AVE	SSW 1/8 - 1/4 (0.139 mi.)	65	176
PITCHER STREET REALT Facility Id: UST-4485 Tank Status: Permanently Closed	26 MAIN ST	NE 1/8 - 1/4 (0.142 mi.)	S67	176
EDDY CHEVROLET (FORM Facility Id: UST-18524 Tank Status: Permanently Closed	45-55 DIVISION ST	ESE 1/8 - 1/4 (0.148 mi.)	U69	178
HALL INSTITUTE (FORM Facility Id: UST-16998 Tank Status: Permanently Closed	120 HIGH ST	N 1/8 - 1/4 (0.154 mi.)	T73	203
CITY OF PAWTUCKET Facility Id: UST-2524 Facility Id: UST-2564 Tank Status: Permanently Closed Tank Status: In Use	137 ROOSEVELT AVE	NNE 1/8 - 1/4 (0.155 mi.)	V74	203
PAWTUCKET BUSINESS A Facility Id: UST-19072 Tank Status: Permanently Closed	123 SCHOOL ST	ENE 1/8 - 1/4 (0.158 mi.)	Q76	204
PAWTUCKET REDEVELOPM	370 MAIN ST	NNW 1/8 - 1/4 (0.160 mi.)	82	227

Facility Id: UST-17292 Tank Status: Permanently Closed				
LANMAR APARTMENTS - Facility Id: UST-4707 Tank Status: Permanently Closed	19 HARRISON ST	WNW 1/8 - 1/4 (0.161 mi.)	83	228
BROADWAY STREET HOLD Facility Id: UST-18511 Tank Status: Permanently Closed	169 GEORGE ST	SW 1/8 - 1/4 (0.161 mi.)	84	228
FAMILY SERVICES SOCI Facility Id: UST-4367 Tank Status: Permanently Closed	33 SUMMER ST	N 1/8 - 1/4 (0.161 mi.)	R85	228
GIBBY'S SERVICE Facility Id: UST-1330 Tank Status: Permanently Closed	385 EAST ST	SSW 1/8 - 1/4 (0.167 mi.)	W86	229
BROADWAY APARTMENTS Facility Id: UST-3193 Tank Status: Permanently Closed	142-144 BROADWAY	NE 1/8 - 1/4 (0.172 mi.)	87	229
SUNOCO #0006-0582 Facility Id: UST-620 Tank Status: Permanently Closed Tank Status: In Use	35 CEDAR ST	WNW 1/8 - 1/4 (0.174 mi.)	Y91	245
B.V. MEDICAL Facility Id: UST-16292 Tank Status: Permanently Closed	279 SCHOOL ST	SE 1/8 - 1/4 (0.176 mi.)	Z94	258
CARITAS HOUSE GROUP Facility Id: UST-15962 Tank Status: Permanently Closed	166 PAWTUCKET AVE	SW 1/8 - 1/4 (0.176 mi.)	AA95	259
SUNOCO SERVICE STA Facility Id: UST-621 Tank Status: Permanently Closed Tank Status: In Use	***81 SCHOOL ST***	***ENE 1/8 - 1/4 (0.184 mi.)***	***AC102***	***290***
PAWTUCKET EVENING TI Facility Id: UST-15641 Tank Status: Permanently Closed	23 EXCHANGE ST	N 1/8 - 1/4 (0.188 mi.)	AD103	302
BOWERS REALTY, INC. Facility Id: UST-829 Tank Status: Permanently Closed	79 DIVISION ST	E 1/8 - 1/4 (0.189 mi.)	AC106	316
THE PAWTUCKET SPOT Facility Id: UST-1828 Tank Status: Permanently Closed Tank Status: In Use	***72 EXCHANGE ST***	***N 1/8 - 1/4 (0.190 mi.)***	***107***	***317***
CITY OF PAWTUCKET PR Facility Id: UST-4125 Tank Status: Permanently Closed	100 TIM HEALEY WAY	SE 1/8 - 1/4 (0.191 mi.)	AE108	318
MCKEE BROS. OIL CORP Facility Id: UST-1895 Tank Status: Permanently Closed	76 SCHOOL ST	ENE 1/8 - 1/4 (0.191 mi.)	AC111	324
J.P. REALTY Facility Id: UST-15929	450 MAIN ST	NW 1/8 - 1/4 (0.206 mi.)	AB115	354

Tank Status: Permanently Closed				
JOE'S CEDAR ST. SHEL Facility Id: UST-808 Tank Status: Permanently Closed Tank Status: In Use	71 CEDAR ST	WNW 1/8 - 1/4 (0.216 mi.)	Y122	366
KELLAWAY Facility Id: UST-19 Tank Status: Permanently Closed	24 COMMERCE ST	NNW 1/8 - 1/4 (0.218 mi.)	AH125	375
SLATER COTTON MILL Facility Id: UST-4259 Tank Status: Permanently Closed	46 CHURCH ST	NW 1/8 - 1/4 (0.221 mi.)	AI126	376
GEORGE H FULLER AND Facility Id: UST-4534 Tank Status: Permanently Closed	151 EXCHANGE ST	NNE 1/8 - 1/4 (0.222 mi.)	AJ129	390
APARTMENT HOUSE Facility Id: UST-3856 Tank Status: Permanently Closed	447 EAST AVE	SSW 1/8 - 1/4 (0.225 mi.)	AF131	401
BLACKSTONE VALLEY ME Facility Id: UST-2379 Tank Status: Permanently Closed	333 SCHOOL ST	SE 1/8 - 1/4 (0.229 mi.)	AE132	401
GOFF GAS Facility Id: UST-544 Tank Status: Permanently Closed Tank Status: Abandoned	75 GOFF AVE	NNW 1/8 - 1/4 (0.231 mi.)	AG135	422
WILLIAM E. TOLMAN SR Facility Id: UST-1425 Tank Status: Permanently Closed	150 EXCHANGE ST	NNE 1/8 - 1/4 (0.232 mi.)	AJ137	425
ST. MARY'S CHURCH AN Facility Id: UST-1037 Tank Status: Permanently Closed	103 PINE ST	WSW 1/8 - 1/4 (0.235 mi.)	140	441
LANMAR APARTMENTS - Facility Id: UST-4775 Tank Status: Permanently Closed	85 PROSPECT ST	E 1/8 - 1/4 (0.235 mi.)	141	441
MORRIS NATHANSON DES Facility Id: UST-18259 Tank Status: Permanently Closed	***163 EXCHANGE ST***	***NNE 1/8 - 1/4 (0.237 mi.)***	***AJ144***	***452***
LEROY THEATRE Facility Id: UST-18294 Tank Status: Permanently Closed	84 BROAD ST	N 1/8 - 1/4 (0.246 mi.)	AL148	479

RI AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Department of Environmental Management's Master List of AST Facilities & Their Associated Tanks.

A review of the RI AST list, as provided by EDR, and dated 08/09/2018 has revealed that there is 1 RI AST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NORTHERN PLAZA ASSOC	301 MAIN ST.	NNW 0 - 1/8 (0.125 mi.)	N56	171

EXECUTIVE SUMMARY

Facility ID: 260012
Tank Status: O-Other

State and tribal institutional control / engineering control registries

RI AUL: This list was developed by RIDEM for use as a general reference and are not meant to be legally authoritative source for the location of hazardous materials, nor for the status, condition or permissible use of a site.

A review of the RI AUL list, as provided by EDR, and dated 01/16/2019 has revealed that there are 19 RI AUL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PET FOOD EXPERTS LLC Siterem Site Number: SR-26-1750	***175 MAIN STREET***	***0 - 1/8 (0.000 mi.)***	***A2***	***18***
SOVEREIGN BANK Siterem Site Number: SR-26-1457	***210 MAIN STREET***	***N 0 - 1/8 (0.017 mi.)***	***A10***	***40***
LAWN TERRACE APARTME Siterem Site Number: SR-26-0933	***180-226 PLEASANT ST***	***SW 0 - 1/8 (0.038 mi.)***	***F23***	***57***
MERCHANTS TIRE Siterem Site Number: SR-26-1540	***21 DIVISION ST***	***E 0 - 1/8 (0.078 mi.)***	***H33***	***83***
APEX INC Siterem Site Number: SR-26-1710 A	***100 MAIN ST***	***NE 0 - 1/8 (0.087 mi.)***	***35***	***105***
WEINBERG COMMERCIAL Siterem Site Number: SR-26-1789 B	***26 SUMMER STREET***	***N 1/8 - 1/4 (0.132 mi.)***	***R59***	***173***
ST GEORGE'S CHURCH (Siterem Site Number: SR-26-1468	***46 MAIN STREET***	***NE 1/8 - 1/4 (0.134 mi.)***	***S61***	***174***
APEX DEVELOPMENT 2 - Siterem Site Number: SR-26-1710 B	***10 SCHOOL STREET***	***NE 1/8 - 1/4 (0.140 mi.)***	***66***	***176***
PHOTOPOULOS D JAMES Siterem Site Number: SR-26-1076	***123 SCHOOL ST***	***ENE 1/8 - 1/4 (0.158 mi.)***	***Q78***	***206***
PARKIN YARN (FORMER) Siterem Site Number: SR-26-1063	***21 COMMERCE STREET***	***NNW 1/8 - 1/4 (0.208 mi.)***	***AB116***	***354***
CENTENIAL TOWERS Siterem Site Number: SR-26-0228	***35 GOFF STREET***	***NNW 1/8 - 1/4 (0.210 mi.)***	***X117***	***355***
PAWTUCKET ARMORY Siterem Site Number: SR-26-1075	***172 EXCHANGE STREET***	***NNE 1/4 - 1/2 (0.251 mi.)***	***AJ151***	***491***
MAACO AUTO PAINTING Siterem Site Number: SR-26-0768	***501 MAIN ST***	***NW 1/4 - 1/2 (0.255 mi.)***	***AI154***	***519***
DENNIS PRINTING COMP Siterem Site Number: SR-26-0369	***69 MONTGOMERY STREET***	***N 1/4 - 1/2 (0.266 mi.)***	***156***	***557***
PINE STREET ASSOCIAT Siterem Site Number: SR-26-1109	***258 PINE STREET***	***NW 1/4 - 1/2 (0.322 mi.)***	***160***	***571***
HARTY REALTY Siterem Site Number: SR-26-0591 A	***59-65 BLACKSTONE AVE***	***NNE 1/4 - 1/2 (0.359 mi.)***	***AN163***	***572***
HARTY REALTY II	***70 BLACKSTONE AVENUE***	***NNE 1/4 - 1/2 (0.377 mi.)***	***AN165***	***573***

Siterem Site Number: SR-26-0591 B				
AUTO ZONE	***262 BARTON STREET***	***NNW 1/4 - 1/2 (0.406 mi.)***	***AO175***	***616***
Siterem Site Number: SR-26-0322 A				
COLLETTE TRAVEL - 1	***164 FRONT STREET***	***NNE 1/4 - 1/2 (0.498 mi.)***	***AS186***	***686***
Siterem Site Number: SR-26-0276 A				

State and tribal Brownfields sites

RI BROWNFIELDS: Brownfields are real properties where the expansion, redevelopment or reuse may be complicated by the actual or reuse may be complicated by the actual or potential presence of a hazardous substance, pollutant, or contaminant.

A review of the RI BROWNFIELDS list, as provided by EDR, and dated 01/16/2019 has revealed that there are 3 RI BROWNFIELDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DR. GOLF (SEE NJD-26	***100 TIM HEALEY WAY***	***SE 1/8 - 1/4 (0.191 mi.)***	***AE110***	***323***
Status: I				
Project: DRG-TBA				
Project: DRG-SUBC				
PAWTUCKET ARMORY	***172 EXCHANGE STREET***	***NNE 1/4 - 1/2 (0.251 mi.)***	***AJ151***	***491***
Status: I				
Project: PAWA-RLF				
C-TOWN	***300 BARTON STREET***	***NNW 1/4 - 1/2 (0.380 mi.)***	***AO167***	***583***
Status: A				
Project: CTN-SUBC				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: The EPA's listing of Brownfields properties from the Cleanups in My Community program, which provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

A review of the US BROWNFIELDS list, as provided by EDR, and dated 12/17/2018 has revealed that there are 15 US BROWNFIELDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
OLD COLONY BANK PARK	MAIN STREET	NNW 1/8 - 1/4 (0.182 mi.)	AB99	268
ACRES property ID: 139541				
OLD COLONY BANK	335 MAIN STREET	NNW 1/8 - 1/4 (0.182 mi.)	AB100	271
ACRES property ID: 125347				
DIVISION STREET PROJ	***SCHOOL AND POND STRE***	***ESE 1/8 - 1/4 (0.188 mi.)***	***105***	***313***
ACRES property ID: 177664				
DR. GOLF	100 TIM HEALEY WAY	SE 1/8 - 1/4 (0.191 mi.)	AE109	318

ACRES property ID: 35142				
PAWTUCKET ARMORY ACRES property ID: 42761	172 EXCHANGE STREET	NNE 1/4 - 1/2 (0.251 mi.)	AJ152	491
FESTIVAL PIER ACRES property ID: 35181	SCHOOL STREET	SE 1/4 - 1/2 (0.265 mi.)	155	530
C-TOWN - LOT 539 ACRES property ID: 125191	300 BARTON STREET	NNW 1/4 - 1/2 (0.380 mi.)	AO166	573
C-TOWN - LOT 541 ACRES property ID: 135201	***300 BARTON STREET***	***NNW 1/4 - 1/2 (0.380 mi.)***	***AO168***	***584***
C-TOWN - LOT 540 ACRES property ID: 135181	300 BARTON STREET	NNW 1/4 - 1/2 (0.380 mi.)	AO169	587
145 BARTON STREET ACRES property ID: 125363	145 BARTON STREET	NNW 1/4 - 1/2 (0.389 mi.)	171	608
76 JEFFERSON AVENUE ACRES property ID: 111162	76 JEFFERSON AVENUE	WSW 1/4 - 1/2 (0.393 mi.)	172	611
101 BARTON STREET ACRES property ID: 125362	101 BARTON STREET	N 1/4 - 1/2 (0.394 mi.)	173	613
15 JACKSON STREET ACRES property ID: 125348	15 JACKSON STREET	N 1/4 - 1/2 (0.428 mi.)	178	668
PCF 2016 PHASE I - 3 ACRES property ID: 219842	***36 MIDDLE STREET***	***NNE 1/4 - 1/2 (0.449 mi.)***	***AP182***	***672***
FRONT STREET PARCELS ACRES property ID: 70028	***164 FRONT STREET***	***NNE 1/4 - 1/2 (0.498 mi.)***	***AS187***	***687***

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/25/2019 has revealed that there are 36 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NEW ENGLAND GAS CO T EPA ID:: RIR000501130	***91 TIDEWATER ST***	***S 0 - 1/8 (0.004 mi.)***	***3***	***18***
SAMOS PRESS EPA ID:: RIR000500074	***30 EAST AVE***	***N 0 - 1/8 (0.013 mi.)***	***A7***	***31***
SPINGARN ANDREW CO EPA ID:: RID987476884	***88 PLEASANT ST***	***NNW 0 - 1/8 (0.019 mi.)***	***D12***	***41***
SPRINGARN ANDREW CO EPA ID:: RID987486701	88 PLEASANT ST	NNW 0 - 1/8 (0.019 mi.)	D13	43
GEM AIR POWER INC EPA ID:: RID144768785	***80 PLEASANT ST***	***NNW 0 - 1/8 (0.020 mi.)***	***D14***	***44***
PRIDE HYUNDAI	***20 DIVISION ST***	***ENE 0 - 1/8 (0.052 mi.)***	***H26***	***59***

EPA ID:: RID981885288				
BLACKSTONE AUTO BODY EPA ID:: RID981062912	***28 DIVISION ST***	***E 0 - 1/8 (0.067 mi.)***	***H31***	***81***
MERCHANTS TIRE EPA ID:: RID982200545	***21 DIVISION ST***	***E 0 - 1/8 (0.078 mi.)***	***H33***	***83***
PODIATRY SERVICES LT EPA ID:: RID001713387	***10 SUMMER ST***	***N 0 - 1/8 (0.084 mi.)***	***J34***	***94***
APEX INC EPA ID:: RID987478419	***100 MAIN ST***	***NE 0 - 1/8 (0.087 mi.)***	***35***	***105***
DZIALO WALTER M DDS EPA ID:: RID987478484	***225 EAST AVE***	***WSW 0 - 1/8 (0.096 mi.)***	***K39***	***137***
NYNEX CTL OFF EPA ID:: RID000841528	***85 HIGH ST***	***N 0 - 1/8 (0.119 mi.)***	***J49***	***151***
VIKING CHEVROLET GEO EPA ID:: RID982747370	***45-55 DIVISION ST***	***ESE 1/8 - 1/4 (0.148 mi.)***	***U70***	***179***
MCGRATH PHILIP DR EPA ID:: RID987469152	***23 BROAD ST***	***N 1/8 - 1/4 (0.149 mi.)***	***R71***	***190***
WIDE WATER PARKWAY EPA ID:: RID980913834	***55 DIVISION ST***	***E 1/8 - 1/4 (0.151 mi.)***	***Q72***	***201***
ROWE AUTOMATIC SALES EPA ID:: RID018521633	***51 S UNION ST***	***NW 1/8 - 1/4 (0.173 mi.)***	***88***	***230***
ST JOSEPH HEALTH CEN EPA ID:: RIR000505412	***40 BROAD ST***	***N 1/8 - 1/4 (0.174 mi.)***	***X89***	***234***
NORTHEAST INSULATION EPA ID:: RID980732119	***279 SCHOOL ST***	***SE 1/8 - 1/4 (0.176 mi.)***	***Z93***	***257***
ORTHOPAEDICS OF NEW EPA ID:: RIR000016188	407 EAST AVE SUITE 1	SSW 1/8 - 1/4 (0.178 mi.)	W96	259
FORTUNA ROBERT J MD EPA ID:: RID987470093	***407 EAST AVE SUITE 1***	***SSW 1/8 - 1/4 (0.178 mi.)***	***W97***	***260***
SPORTS MEDICINE ORTH EPA ID:: RIR000504878	***127 SCHOOL ST***	***E 1/8 - 1/4 (0.184 mi.)***	***AC101***	***281***
SUNOCO SERVICE STA EPA ID:: RID000843078	***81 SCHOOL ST***	***ENE 1/8 - 1/4 (0.184 mi.)***	***AC102***	***290***
TIMES THE EPA ID:: RID987466141	***23 EXCHANGE ST***	***N 1/8 - 1/4 (0.188 mi.)***	***AD104***	***302***
ROGUE PAUL G DDS EPA ID:: RID987486099	***32 GOFF AVE RM 205***	***NNW 1/8 - 1/4 (0.202 mi.)***	***AG114***	***344***
ROYAL CLEANSERS INC EPA ID:: RI5000001917	***191 PAWTUCKET AVE***	***SW 1/8 - 1/4 (0.213 mi.)***	***AA119***	***355***
HASKELL WILLIAM H MF EPA ID:: RID082609983	***24 COMMERCE ST***	***NNW 1/8 - 1/4 (0.218 mi.)***	***AH124***	***367***
HUTCHINSON GROUP THE EPA ID:: RID987468808	***46 CHURCH ST***	***NW 1/8 - 1/4 (0.221 mi.)***	***AI127***	***377***
FULLER GEORGE H & SO EPA ID:: RID001200096	***151 EXCHANGE ST***	***NNE 1/8 - 1/4 (0.222 mi.)***	***AJ130***	***391***
TEXACO STA/COLEMAN T	***75 GOFF AVE***	***NNW 1/8 - 1/4 (0.231 mi.)***	***AG136***	***423***

EPA ID:: RI5000002014				
AIME & SONS AUTOMOTI	***79 GOFF AVE***	***NNW 1/8 - 1/4 (0.234 mi.)***	***AK138***	***425***
EPA ID:: RID987473766				
PROFESSIONAL PLATERS	***79 GOFF AVE***	***NNW 1/8 - 1/4 (0.234 mi.)***	***AK139***	***436***
EPA ID:: RID080819543				
THOMAS STREET STUDIO	***163 EXCHANGE ST***	***NNE 1/8 - 1/4 (0.237 mi.)***	***AJ143***	***451***
EPA ID:: RIR000501346				
DARLENE JEWELRY MFG	***483 MAIN ST***	***NW 1/8 - 1/4 (0.241 mi.)***	***145***	***453***
EPA ID:: RID001190610				
TALLMAN ENTERPRISES	44A PINE ST	SW 1/8 - 1/4 (0.244 mi.)	146	466
EPA ID:: RID987477643				
ASBESTOS REMOVAL & C	***84 BROAD ST SUITE 21***	***N 1/8 - 1/4 (0.246 mi.)***	***AL149***	***479***
EPA ID:: RID980525570				
SILES DANA PHOTOGRAP	***498 MAIN ST***	***NW 1/8 - 1/4 (0.248 mi.)***	***AI150***	***480***
EPA ID:: RIR000502534				

RI DRYCLEANERS: A listing of drycleaner locations.

A review of the RI DRYCLEANERS list, as provided by EDR, and dated 01/31/2018 has revealed that there is 1 RI DRYCLEANERS site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MR USA 1 HOUR CLEANI	***224 EAST AVE***	***WSW 0 - 1/8 (0.089 mi.)***	***K36***	***116***
Alternative Site Id: AIR1018				

RI MANIFEST: Hazardous waste manifest information

A review of the RI MANIFEST list, as provided by EDR, and dated 12/31/2017 has revealed that there are 37 RI MANIFEST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NEW ENGLAND GAS CO T	***91 TIDEWATER ST***	***S 0 - 1/8 (0.004 mi.)***	***3***	***18***
EPA Id: RIR000501130				
Manifest Document Number: MAM686768				
SAMOS PRESS	***30 EAST AVE***	***N 0 - 1/8 (0.013 mi.)***	***A7***	***31***
EPA Id: RIR000500074				
Manifest Document Number: MAQ918137				
GEM AIR POWER INC	***80 PLEASANT ST***	***NNW 0 - 1/8 (0.020 mi.)***	***D14***	***44***
EPA Id: RID144768785				
Manifest Document Number: RIG0179509				
PRIDE HYUNDAI	***20 DIVISION ST***	***ENE 0 - 1/8 (0.052 mi.)***	***H26***	***59***
EPA Id: RID981885288				
Manifest Document Number: RIG0189772				
APEX AUTOMOTIVE SERV	***1 SCHOOL ST***	***NNE 0 - 1/8 (0.061 mi.)***	***I29***	***71***
EPA Id: RID987470606				
Manifest Document Number: RIH0018822				
MERCHANTS TIRE	***21 DIVISION ST***	***E 0 - 1/8 (0.078 mi.)***	***H33***	***83***

EPA Id: RID982200545 Manifest Document Number: MAF306915				
PODIATRY SERVICES LT EPA Id: RID001713387 Manifest Document Number: MAQ130784	***10 SUMMER ST***	***N 0 - 1/8 (0.084 mi.)***	***J34***	***94***
APEX INC EPA Id: RID987478419 Manifest Document Number: 000958564SKS	***100 MAIN ST***	***NE 0 - 1/8 (0.087 mi.)***	***35***	***105***
MR USA 1 HOUR CLEANE EPA Id: RID980909345 Manifest Document Number: MAF113604	***224 EAST AVE***	***WSW 0 - 1/8 (0.089 mi.)***	***K37***	***120***
DZIALO WALTER M DDS EPA Id: RID987478484 Manifest Document Number: MAJ171903	***225 EAST AVE***	***WSW 0 - 1/8 (0.096 mi.)***	***K39***	***137***
NYNEX CTL OFF EPA Id: RID000841528 Manifest Document Number: MAG110959	***85 HIGH ST***	***N 0 - 1/8 (0.119 mi.)***	***J49***	***151***
BLACKSTONE VALLEY CO EPA Id: RI5000001032 Manifest Document Number: 000500014VES	***42 PARK PLACE***	***NNW 0 - 1/8 (0.121 mi.)***	***P52***	***162***
VIKING CHEVROLET GEO EPA Id: RID982747370 Manifest Document Number: RIG0008824	***45-55 DIVISION ST***	***ESE 1/8 - 1/4 (0.148 mi.)***	***U70***	***179***
MCGRATH PHILIP DR EPA Id: RID987469152 Manifest Document Number: MAG162216	***23 BROAD ST***	***N 1/8 - 1/4 (0.149 mi.)***	***R71***	***190***
PHOTOPOULOS D JAMES EPA Id: RID987475829 Manifest Document Number: MAF367131	***123 SCHOOL ST***	***ENE 1/8 - 1/4 (0.158 mi.)***	***Q78***	***206***
PHOTOPOULOS D JAMES EPA Id: RID987486214 Manifest Document Number: MAF367567	***123 SCHOOL ST***	***ENE 1/8 - 1/4 (0.158 mi.)***	***Q79***	***217***
ROWE AUTOMATIC SALES EPA Id: RID018521633 Manifest Document Number: MAG139538	***51 S UNION ST***	***NW 1/8 - 1/4 (0.173 mi.)***	***88***	***230***
ST JOSEPH HEALTH CEN EPA Id: RIR000505412 Manifest Document Number: 004722944FLE	***40 BROAD ST***	***N 1/8 - 1/4 (0.174 mi.)***	***X89***	***234***
SUNOCO SERVICE STA EPA Id: RID000843656 Manifest Document Number: MAF015204	***35 CEDAR ST***	***WNW 1/8 - 1/4 (0.174 mi.)***	***Y92***	***247***
FORTUNA ROBERT J MD EPA Id: RID987470093 Manifest Document Number: MAC898119	***407 EAST AVE SUITE 1***	***SSW 1/8 - 1/4 (0.178 mi.)***	***W97***	***260***
SPORTS MEDICINE ORTH EPA Id: RIR000504878 Manifest Document Number: 1222158	***127 SCHOOL ST***	***E 1/8 - 1/4 (0.184 mi.)***	***AC101***	***281***
SUNOCO SERVICE STA EPA Id: RID000843078	***81 SCHOOL ST***	***ENE 1/8 - 1/4 (0.184 mi.)***	***AC102***	***290***

Manifest Document Number: NHC0022995				
TIMES THE	***23 EXCHANGE ST***	***N 1/8 - 1/4 (0.188 mi.)***	***AD104***	***302***
EPA Id: RID987466141				
Manifest Document Number: MAC898090				
C V S #2234	***425 EAST AVE***	***SSW 1/8 - 1/4 (0.199 mi.)***	***AF113***	***325***
EPA Id: RIR000500157				
Manifest Document Number: 003625507JJK				
ROGUE PAUL G DDS	***32 GOFF AVE RM 205***	***NNW 1/8 - 1/4 (0.202 mi.)***	***AG114***	***344***
EPA Id: RID987486099				
Manifest Document Number: MAG162504				
JOE'S CEDAR STREET S	***71 CEDAR ST & PINE***	***WNW 1/8 - 1/4 (0.216 mi.)***	***Y121***	***357***
EPA Id: RID987470374				
Manifest Document Number: MAC221128				
HASKELL WILLIAM H MF	***24 COMMERCE ST***	***NNW 1/8 - 1/4 (0.218 mi.)***	***AH124***	***367***
EPA Id: RID082609983				
Manifest Document Number: RIA0012795				
HUTCHINSON GROUP THE	***46 CHURCH ST***	***NW 1/8 - 1/4 (0.221 mi.)***	***AI127***	***377***
EPA Id: RID987468808				
Manifest Document Number: MAG100566				
FULLER GEORGE H & SO	***151 EXCHANGE ST***	***NNE 1/8 - 1/4 (0.222 mi.)***	***AJ130***	***391***
EPA Id: RID001200096				
Manifest Document Number: RIH0000634				
R I MEDICAL IMAGING	***333 SCHOOL ST***	***SE 1/8 - 1/4 (0.229 mi.)***	***AE133***	***402***
EPA Id: RID982543944				
Manifest Document Number: B/L 2146				
SILVERMAN ANDREW B D	***333 SCHOOL ST STE 20***	***SE 1/8 - 1/4 (0.229 mi.)***	***AE134***	***412***
EPA Id: RIR000506733				
Manifest Document Number: 000540149GBF				
AIME & SONS AUTOMOTI	***79 GOFF AVE***	***NNW 1/8 - 1/4 (0.234 mi.)***	***AK138***	***425***
EPA Id: RID987473766				
Manifest Document Number: RIG0175902				
PROFESSIONAL PLATERS	***79 GOFF AVE***	***NNW 1/8 - 1/4 (0.234 mi.)***	***AK139***	***436***
EPA Id: RID080819543				
Manifest Document Number: RIA0012295				
CENTRAL AUTO RADIATO	***188 PINE ST***	***WNW 1/8 - 1/4 (0.236 mi.)***	***142***	***441***
EPA Id: RID987486867				
Manifest Document Number: 005776243SKS				
DARLENE JEWELRY MFG	***483 MAIN ST***	***NW 1/8 - 1/4 (0.241 mi.)***	***145***	***453***
EPA Id: RID001190610				
Manifest Document Number: RIC0026989				
GANSETT AUTO PARTS	***206 PINE ST***	***NW 1/8 - 1/4 (0.246 mi.)***	***AI147***	***468***
EPA Id: RID987478468				
Manifest Document Number: RIG0189750				
SILES DANA PHOTOGRAP	***498 MAIN ST***	***NW 1/8 - 1/4 (0.248 mi.)***	***AI150***	***480***
EPA Id: RIR000502534				
Manifest Document Number: MAU210955				

NY MANIFEST: Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

A review of the NY MANIFEST list, as provided by EDR, and dated 01/01/2019 has revealed that there are 3 NY MANIFEST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIDOT PROJECT EPA ID: RIP000033216	50 DIVISION ST	E 1/8 - 1/4 (0.127 mi.)	Q57	172
EDDY CHEVROLET & BUI EPA ID: RIP000001582	45-55 DIVISION STREE	ESE 1/8 - 1/4 (0.148 mi.)	U68	177
DARLENE JEWELRY MFG EPA ID: RID001190610	***483 MAIN ST***	***NW 1/8 - 1/4 (0.241 mi.)***	***145***	***453***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

A review of the EDR MGP list, as provided by EDR, has revealed that there are 2 EDR MGP sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TIDEWATER COAL GASIF	OFF TIDEWATER AVE	SSE 0 - 1/8 (0.010 mi.)	B4	30
PAWTUCKET GAS CO	HIGH STREET	N 1/2 - 1 (0.670 mi.)	AX209	743

EDR Hist Cleaner: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Cleaner list, as provided by EDR, has revealed that there is 1 EDR Hist Cleaner site within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STANLEY SYSTEM DRY C	224 EAST AVE	WSW 0 - 1/8 (0.089 mi.)	K38	136

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 99 records.

Site Name	Database(s)
MAIN ST	RI SPILLS 90
EAST ST	RI SPILLS 90
OCEAN STATE STEEL INC	CORRACTS, RCRA NonGen / NLR, 2020 COR ACTION, RI MANIFEST
NBC CENTRAL FALLS CSO - PCBS	RI SHWS, RI AUL
WEINBERG COMMERCIAL PROPERTY	RI SHWS, RI AUL
HORD CRYSTAL CORPORATION	RI SHWS, RI AUL
PAWTUCKET TRAIN STATION (FORMER)	RI SHWS, RI AUL
PETULA ASSOCIATES (ALSO SEE BEATTY	RI SHWS, RI AUL
J & K SALES CO INC	RI SHWS, RI AUL, RCRA NonGen / NLR, RI MANIFEST
LAUREL HILL (PLAYGROUND)	RI SHWS, RI AUL, RI BROWNFIELDS
FESTIVAL PIER	RI SHWS, RI AUL, RI BROWNFIELDS, RI SPILLS
HOSPITAL-ELM REALTY, LLC	RI SHWS, RI AUL
BROWN UNIVERSITY - SOUTH WALK	RI SHWS, RI AUL
JOHNSON & WALES - FORMER CLAVERICK	RI SHWS, RI AUL
ROUTE 195 DOT PROJECT 87	RI SHWS, RI AUL
STARWOOD WASSERMAN	RI SHWS, RI AUL
NATIONAL GRID - INDOOR SUBSTATION	RI SHWS, RI AUL
METCALF PARKING LOT	RI SHWS, RI AUL
MAIN WATER POWER PLANT	RI SHWS, RI AUL
UNION STATION PLAZA HOTEL	RI SHWS, RI AUL
ROUTE 195 DOT PROJECT 83	RI SHWS, RI AUL
ROUTE 195 DOT PROJECT 84	RI SHWS, RI AUL
MEETING STREET SCHOOL - FREEWAY PL	RI SHWS, RI AUL
FOX PLACE (OMNI)	RI SHWS, RI AUL
NATIONAL GRID - CENTRAL FALLS SUBS	RI SHWS
RIVER STREET PARK	RI SHWS
DEXTER STREET LOFTS, LLC	RI SHWS
PAWTUCKET BRIDGE #550 REMEDIATION	RI SHWS
PAWTUCKET REDEVELOPMENT AGENCY- BA	RI SHWS, RI BROWNFIELDS
CONANT STREET MILL SITE - LOT 569	RI SHWS
ARMANDO REALTY LLC - GOFF AVENUE P	RI SHWS
GROTTO AVENUE LOT 236 (ALSO PROCAC	RI SHWS, RI BROWNFIELDS
AFRICO PROPERTY II (FORMER)	RI SHWS
MAX READ FIELD	RI SHWS
EAST STREET PARK	RI SHWS
TOWN LANDING (PAWTUCKET LANDING)	RI SHWS, RI BROWNFIELDS
BLACKSTONE VALLEY ELECT STOR (FORM	RI SHWS
ROUTE 195 DOT PROJECT CONTRACT 17	RI SHWS
MAGNOLIA STREET BRIDGE REMOVAL (6/	RI SHWS
RIDOT-PROVIDENCE VIADUCT-BRIDGE 57	RI SHWS
OCTOBER 3 2018 GASOLINE TANKER ROL	RI SHWS
ALGONQUIN LNG LINE	RI SHWS
MIRIAM HOSPITAL SEVENTH ST. PARKIN	RI SHWS
PROCAP HOUSING, INC.	RI SHWS
BROWN UNIVERSITY - UTILITY UPGRADE	RI SHWS
RI HOSPITAL PARKING LOT C -ADDITIO	RI SHWS
RI HOSPITAL (SEE CNC CHEMICAL FILE	RI SHWS
NATIONAL GRID - FIELD'S POINT SUBS	RI SHWS
RIDOT - BRIDGE NO. 065901	RI SHWS
CAPITAL CENTER PROJECT (SEE PARCEL	RI SHWS
STATE OF RI - DOA (FRANCIS ST PARK	RI SHWS
CAPITAL CTR PROJ PARCEL 9 (SEE SR-	RI SHWS
NG - PROVIDENCE RIVER CABLE RELOCA	RI SHWS
BROWN UNIVERSITY MAIN GREEN	RI SHWS
HARRIS RAILROAD BRIDGE #510 & TOBE	RI SHWS
RI DOT - HAYWARD PARK	RI SHWS

EXECUTIVE SUMMARY

ROUTE 195 DOT PROJECT 92	RI SHWS
BUTTON HOLE GOLF COURSE	RI SHWS, RI BROWNFIELDS
FARM FRESH RHODE ISLAND - PROVIDEN	RI SHWS, RI LUST
STARWOOD WASSERMAN	RI SHWS
MANTON AVENUE BRIDGE NO.78	RI SHWS
MANTON AVENUE SKATE PARK	RI SHWS
NATIONAL GRID - VAULT # 35	RI SHWS
NATIONAL GRID - VAULT #26	RI SHWS
ROUTE 195 DOT PROJECT 61	RI SHWS
ROUTE 195 DOT PROJECT 13 (SEE 12)	RI SHWS
ROUTE 195 DOT PROJECT 19	RI SHWS
ROUTE 195 DOT PROJECT 23	RI SHWS
ROUTE 195 DOT PROJECT 89	RI SHWS
ROUTE 195 DOT PROJECT 8	RI SHWS
ROUTE 195 DOT PROJECT 79	RI SHWS
ROUTE 195 DOT PROJECT 78	RI SHWS
ROUTE 195 DOT PROJECT 59	RI SHWS
ROUTE 195 DOT PROJECT 12	RI SHWS
ROUTE 195 DOT PROJECT 90	RI SHWS
ROUTE 195 DOT PROJECT 9	RI SHWS
GRAY REALTY PROPERTY	RI SHWS
DOT BRIDGE 327 - PROVIDENCE	RI SHWS
FURNITURE BANK OF RI - FORMER LOCA	RI SHWS
RIDOT ROW SMITHFIELD AVENUE (ROUTE	RI SHWS
80 SOUTH STREET	RI SHWS
R. WILLIAMS HOME SITE (SEE MANDELL	RI SHWS
NATIONAL GRID - TRANSMISSION LINE	RI SHWS
EAST TRANSIT STREET BOAT RAMP	RI SHWS
BLACKSTONE RIVER BIKEWAY - SEGMENT	RI SHWS
NATIONAL GRID -UNION STREET VAULT	RI SHWS
EASTERN REPAIR AND WATERPROOFING	RI SHWS
WASHINGTON BRIDGE	RI SHWS
PLEASANT STREET MERCURY SPILL	SEMS-ARCHIVE
E - O INCORPORATED	RI LUST
LANMAR APARTMENTS 93-95 HARRISON S	RI LUST
TEKNOR APEX - 1	RI LUST
BLACKSTONE VALLEY ELECTRIC COMPANY	RI LUST
WOODLAWN LAUNDRY & CLEANERS	RI LUST
MARCELLO BUILDING	RI LUST
COMMUNITY CENTER	RI LUST
CAPITAL CENTER PROJECT	RI LUST
SHELL STATION	RI LUST
EAST ST SERVICE CENTER	EDR Hist Auto

OVERVIEW MAP - 5664991.2S

0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Taft St	CLIENT:	Beta Engineering Inc.
ADDRESS:	Taft St Pawtucket RI 02860	CONTACT:	Joe Mcloughlin
		INQUIRY #:	5664991.2s
LAT/LONG:	41.872563 / -71.384739	DATE:	May 28, 2019 12:21 pm

Copyright © 2019 EDR, Inc. © 2015 TomTom Rel. 2015.

DETAIL MAP - 5664991.2S

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Taft St	CLIENT:	Beta Engineering Inc.
ADDRESS:	Taft St	CONTACT:	Joe Mcloughlin
	Pawtucket RI 02860	INQUIRY #:	5664991.2s
LAT/LONG:	41.872563 / -71.384739	DATE:	May 28, 2019 12:23 pm

Copyright © 2019 EDR, Inc. © 2015 TomTom Rel. 2015.

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		1	0	0	NR	NR	1
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	1	NR	NR	NR	1
RCRA-SQG	0.250		3	9	NR	NR	NR	12
RCRA-CESQG	0.250		1	1	NR	NR	NR	2
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
RI SHWS	1.000		7	13	15	50	NR	85
State and tribal landfill and/or solid waste disposal site lists								
RI SWF/LF	0.500		0	0	0	NR	NR	0
RI LCP	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
RI LUST	0.500		2	10	14	NR	NR	26
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RI UST	0.250		29	38	NR	NR	NR	67
RI AST	0.250		1	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
RI AUL	0.500		5	6	8	NR	NR	19
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
RI BROWNFIELDS	0.500		0	1	2	NR	NR	3
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500	1	0	4	11	NR	NR	16
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
RI CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
RI SPILLS	TP		NR	NR	NR	NR	NR	0
RI SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		12	24	NR	NR	NR	36
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
RI AIRS	TP		NR	NR	NR	NR	NR	0
RI ASBESTOS	TP		NR	NR	NR	NR	NR	0
RI DRYCLEANERS	0.250		1	0	NR	NR	NR	1
RI Financial Assurance	TP		NR	NR	NR	NR	NR	0
RI LEAD	TP		NR	NR	NR	NR	NR	0
RI MANIFEST	0.250		12	25	NR	NR	NR	37
NJ MANIFEST	0.250		0	0	NR	NR	NR	0
NY MANIFEST	0.250		0	3	NR	NR	NR	3
RI NPDES	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		1	0	0	1	NR	2
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		1	NR	NR	NR	NR	1
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RI RGA HWS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RI RGA LF	TP		NR	NR	NR	NR	NR	0
RI RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		1	76	135	50	51	0	313

NOTES:

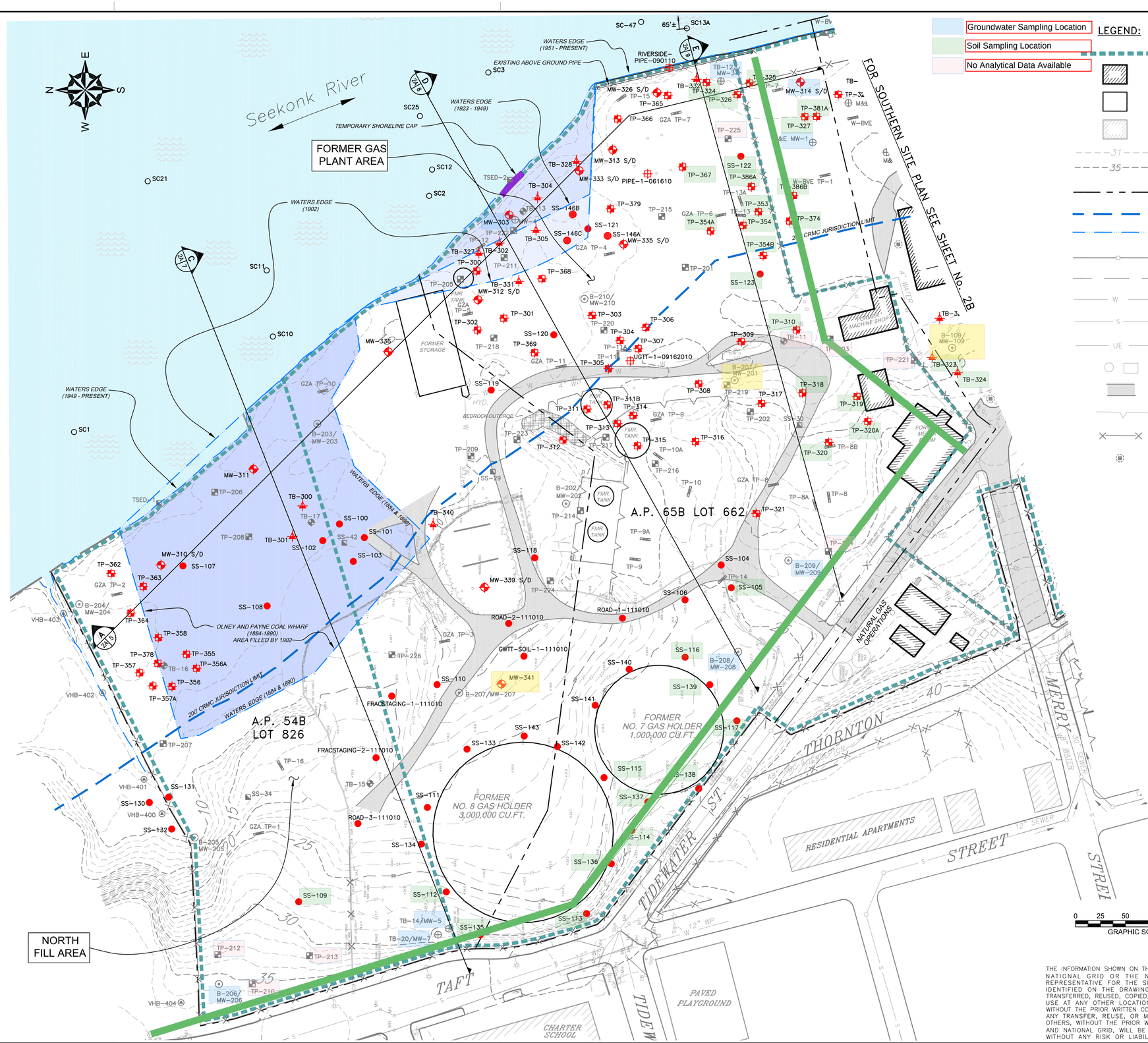
TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

APPENDIX B

HISTORIC REPORTS



Groundwater Sampling Location

Soil Sampling Location

No Analytical Data Available

LEGEND:

- SITE AREA BOUNDARIES
- EXISTING BUILDINGS ON-SITE
- EXISTING FOUNDATION/PAD ON-SITE
- EXISTING BUILDINGS/STRUCTURES OFF-SITE
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPERTY LINE
- APPROX. 200 FT. CRMC JURISDICTION LIMIT
- APPROX. WATERS EDGE
- EXISTING NBC INTERCEPTOR SANITARY SEWER
- EXISTING CITY OF PAWTUCKET STORM DRAIN
- EXISTING WATER LINE
- EXISTING STORM/COMBINED SAN. SEWER OVERFLOW
- EXISTING UNDERGROUND ELECTRIC CABLE IN CONDUIT
- EXISTING UNDERGROUND ELECTRIC MH/STRUCTURE
- EXISTING ACCESS ROAD
- EXISTING RETAINING WALLS
- EXISTING FENCE
- EXISTING CATCH BASIN LOCATIONS

SAMPLE LEGEND

SS-9	ATLANTIC SURFACE SOIL SAMPLE LOCATION
TSED-6	ATLANTIC SEDIMENT SAMPLE LOCATION
W-BVE SS-3	WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
RIDEM SS-3	RIDEM SURFACE SOIL SAMPLE LOCATION
B-109/ MW-109	MONITORING WELL/BORING (VHB) SURVEYED
TP-3A	ATLANTIC TEST PIT LOCATION
W-BVE	WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
GZA TP-8	GZA/VALLEY GAS TEST PIT LOCATION
TB-15	ATLANTIC SOIL BORING LOCATION
MW-3	ATLANTIC MONITORING WELL LOCATION
M&E MW-1	METCALF & EDDY MONITORING WELL LOCATION
VHB-400	VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
TP-204	VHB TEST PIT (2006)
GZ-01	GZA TEST PIT (2009)
TB-300	GZA TEST BORING LOCATION (2010)
MW-320 S/D	GZA MONITORING WELL LOCATION (2010)
TP-306	GZA TEST PIT LOCATION (2010)
SS-100	GZA SURFACE SOIL SAMPLE LOCATION (2010)
SC31	ARCADIS SEDIMENT SAMPLE LOCATION (2008)
PIPE-1-061610	GZA RESIDUAL MATERIAL SAMPLE (2010)

GENERAL NOTES:

1. EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
   - ELECTRONIC FILES FROM GEI CONSULTANTS, INC. (FORMERLY AES) ENTITLED "HISTORIC STRUCTURES AND SAMPLE LOCATIONS", ORIGINAL SCALE 1"=80', DATED JULY 1999
   - ELECTRONIC FILES FROM VANASSE HANGEN BRUSTLIN, INC. ENTITLED "SOIL BORING, TEST PIT AND MONITOR WELL LOCATIONS", SCALE: 1"=60', UNDATED
   - ELECTRONIC FILES FROM WELSH ASSOCIATES LAND SURVEYORS, INC. ENTITLED "TOPOGRAPHIC SURVEY (AS-BUILT), FORMER TIDEWATER FACILITY, DEMOLITION OF GAS HOLDERS NOS. 7 & 8", DATED DECEMBER 17, 2010
   - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS DURING 2009 AND 2010.
2. PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES AND AN AUTO CAD FILE ENTITLED "MAX READ FIELD TRACK EXPANSION 2007" PROVIDED BY THE CITY OF PAWTUCKET.
3. HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
4. VERTICAL DATUM IS BASED ON NGVD 1929 (MSL) FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
5. REFERENCE SEWER DATA FROM SCANNED IMAGE PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND, ENTITLED "STUDY OF SEWERAGE FACILITIES" BY WATERMAN ENGINEERING CO. & ANDERSON NICHOLS CO. DATED NOV. 1975, ORIGINAL SCALE 1"=400' & SCANNED IMAGES OF HISTORIC PLAN & PROFILE DRAWINGS PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND.
6. SITE UTILITIES TAKEN FROM 1984 SANBORN MAP AND HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NO.	ISSUE/DESCRIPTION	BY	DATE

FORMER TIDEWATER FACILITY

PAWTUCKET, RHODE ISLAND

EXPLORATION LOCATION PLAN
NORTH FILL AREA AND FORMER GAS PLANT AREA

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
530 BROADWAY
PROVIDENCE, RHODE ISLAND 02909
(401) 421-4140

PREPARED FOR: NATIONAL GRID

PROJ MGR: MSK	REVIEWED BY: WF	CHECKED BY: MSK	FIGURE 2A
DESIGNED BY: WF	DRAWN BY: CRD	SCALE: 1"=50"	
DATE JANUARY 2011	PROJECT NO. 43654.00	REVISION NO. 0	SHEET NO. 1 OF 24

©2010 GZA GeoEnvironmental, Inc. GZA-J:\ENV\43654-mgp\CADD\GZA DWGS\SUPPLEMENTAL_SITE_INVESTIGATION_REPORT\43654-00_F2A-4B_RD_SSR-EXP-PLANS.dwg [2A] January 07, 2011 - 4:29pm deborah.landi

BETA Soil Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	B-4 0-2ft	B-4 2-4ft	B-4 4-6ft	B-4 6-10ft	B-5 0-2ft	B-5 2-4ft	B-5 4-6ft	B-5 6-10ft	B-6 0-2ft	B-6 2-4ft	B-6A 0-2ft	B-6A 2-4ft	B-6A 4-6ft	B-6A 6-10ft	B-7 0-2ft	B-7 2-4ft	B-7 4-6ft	B-7 6-10ft	B-8 0-2ft	B-8 2-4ft	B-8 4-6ft	B-8 6-10ft	RIDEM ResDEC	RIDEM ICDEC
Sample Date	**08/28/2019**	**08/28/2019**	**08/28/2019**	**08/28/2019**	**08/27/2019**	**08/27/2019**	**08/27/2019**	**08/27/2019**	**08/29/2019**	**08/29/2019**	**9/18/2019**	**9/18/2019**	**9/18/2019**	**9/18/2019**	**08/30/2019**	**08/30/2019**	**08/30/2019**	**08/30/2019**	**09/03/2019**	**09/03/2019**	**9/10/2019**	**9/10/2019**		
Volatile Organic Compounds, mg/kg																								
Acetone	0.0331 U	0.0379 U	0.0449 U	0.028 U	0.0347 U	0.0354 U	0.044 U	0.0393 U	0.0386 U	**0.0513**	0.0359 U	0.0462 U	0.04 U	0.0384 U	0.0395 U	**0.0472**	0.0582 U	0.0407 U	0.0409 U	0.0397 U	0.0369 U	0.0346 U	7,800	10,000
1,1-Dichloroethene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	0.0046 U	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	0.2	9.5
1,2-Dibromo-3-Chloropropane	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	0.0046 U	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	0.5	4.1
1,2-Dibromoethane	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	0.0046 U	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	0.01	0.07
Benzene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	**0.291**	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	2.5	200
Methylene Chloride	0.0166 U	0.0189 U	0.0225 U	0.014 U	0.0173 U	0.0177 U	0.022 U	0.0197 U	0.0193 U	0.0203 U	0.018 U	0.0231 U	0.02 U	0.0192 U	0.0198 U	**0.0733**	**0.0732**	0.0204 U	0.0205 U	0.0199 U	0.0185 U	0.0173 U	45	760
Tetrachloroethene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	**0.0560**	**0.0787**	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	12	110
Toluene	0.0033 U	0.0038 U	0.0045 U	0.0028 U	0.0035 U	0.0035 U	0.0044 U	0.0039 U	0.0039 U	0.0041 U	0.0036 U	0.0046 U	0.004 U	0.0038 U	0.004 U	**0.151**	0.0058 U	0.0041 U	0.0041 U	0.004 U	0.0037 U	0.0035 U	190	10,000
Vinyl Chloride	0.0066 U	0.0076 U	0.009 U	0.0056 U	0.0069 U	0.0071 U	0.0088 U	0.0079 U	0.0077 U	0.0081 U	0.0072 U	0.0092 U	0.008 U	0.0077 U	0.0079 U	0.0092 U	0.0116 U	0.0081 U	0.0082 U	0.0079 U	0.0074 U	0.0069 U	0.02	3
Xylene P,M	0.0066 U	0.0076 U	0.009 U	0.0056 U	0.0069 U	0.0071 U	0.0088 U	0.0079 U	0.0077 U	0.0081 U	0.0072 U	0.0092 U	0.008 U	0.0077 U	0.0079 U	**0.0539**	0.0116 U	0.0081 U	0.0082 U	0.0079 U	0.0074 U	0.0069 U	110	10,000
Total VOCs	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.05**	ND	ND	ND	ND	ND	**0.67**	**0.15**	ND	ND	ND	ND	ND	NE	NE
Semi-Volatile Organic Compounds, mg/kg																								
Anthracene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**0.879**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	1.53 U	1.64 U	1.67 U	**0.523**	0.359 U	0.364 U	0.387 U	0.396 U	35	10,000
Benzo(a)anthracene	0.75 U	**0.800**	0.754 U	0.718 U	0.344 U	0.372 U	**2.29**	**0.388**	0.381 U	**0.370**	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**1.83**	0.359 U	0.364 U	0.387 U	**0.473**	0.9	7.8
Benzo(a)pyrene	0.376 U	**0.665**	0.378 U	0.36 U	0.173 U	0.187 U	**1.98**	**0.300**	**0.250**	**0.331**	0.189 U	0.178 U	0.189 U	**0.261**	0.305 U	**0.399**	**0.394**	**1.70**	0.18 U	0.183 U	**0.385**	**0.559**	0.4	0.8
Benzo(b)fluoranthene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**1.40**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**1.49**	0.359 U	0.364 U	**0.481**	**0.625**	0.9	7.8
Benzo(g,h,i)perylene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**1.11**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.459 U	0.493 U	0.5 U	**0.847**	0.359 U	0.364 U	0.387 U	0.396 U	0.8	10,000
Benzo(k)fluoranthene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**2.07**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**1.58**	0.359 U	0.364 U	0.387 U	**0.523**	0.9	78
Chrysene	0.376 U	**0.815**	**0.398**	0.36 U	0.173 U	0.187 U	**2.04**	**0.324**	**0.230**	**0.337**	0.189 U	0.178 U	0.189 U	**0.262**	0.305 U	**0.413**	**0.485**	**1.95**	0.18 U	0.183 U	**0.453**	**0.616**	0.4	780
Dibenzo(a,h)Anthracene	0.376 U	0.36 U	0.378 U	0.36 U	0.173 U	0.187 U	**0.510**	0.178 U	0.191 U	0.185 U	0.189 U	0.178 U	0.189 U	0.184 U	0.305 U	0.328 U	0.333 U	**0.305**	0.18 U	0.183 U	0.194 U	0.198 U	0.4	0.8
Fluoranthene	0.75 U	**1.80**	0.754 U	0.718 U	0.344 U	0.372 U	**4.35**	**1.02**	**0.468**	**0.665**	0.376 U	0.354 U	0.377 U	**0.395**	1.53 U	1.64 U	1.67 U	**4.49**	0.359 U	0.364 U	**0.834**	**1.01**	20	10,000
Indeno(1,2,3-cd)Pyrene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	**1.10**	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.766 U	0.823 U	0.836 U	**0.811**	0.359 U	0.364 U	0.387 U	0.396 U	0.9	7.8
Naphthalene	0.75 U	0.717 U	0.754 U	0.718 U	0.344 U	0.372 U	0.383 U	0.356 U	0.381 U	0.369 U	0.376 U	0.354 U	0.377 U	0.366 U	0.382 U	0.41 U	0.417 U	**0.401**	0.359 U	0.364 U	0.387 U	0.396 U	54	10,000
Phenanthrene	0.75 U	**1.73**	0.754 U	0.718 U	0.344 U	0.372 U	**3.52**	**1.12**	0.381 U	**0.376**	0.376 U	0.354 U	0.377 U	0.366 U	1.53 U	1.64 U	1.67 U	**3.47**	0.359 U	0.364 U	0.387 U	0.396 U	40	10,000
Pyrene	0.75 U	**1.82**	**0.859**	0.718 U	0.344 U	0.372 U	**4.02**	**0.844**	**0.424**	**0.593**	0.376 U	0.354 U	0.377 U	**0.482**	1.53 U	1.64 U	1.67 U	**3.73**	0.359 U	0.364 U	**0.825**	**1.07**	13	10,000
Total SVOCs	ND	**7.6**	**1.3**	ND	ND	ND	**25.3**	**4.0**	**1.4**	**2.7**	ND	ND	ND	**1.4**	ND	0.8	0.9	**23.1**	ND	ND	**3.0**	**4.9**	NE	NE
Total Petroleum Hydrocarbons, mg/kg																								
Total Petroleum Hydrocarbons	**886**	**1,370**	**744**	**543**	**160**	**1,850**	**233**	**136**	**390**	**205**	41.5 U	**310**	40.6 U	**60.3**	**973**	**735**	**1,220**	**143**	41.8 U	38.8 U	**59.6**	**68.6**	500	2,500
Total Metals, mg/kg																								
Antimony	3.93 U	5.19 U	1.79 U	4.06 U	5.24 U	3.98 U	4.49 U	5.37 U	1.97 U	5.2 U	4.33 U	5.2 U	4.56 U	4.16 U	3.29 U	4.75 U	2.39 U	**5.24**	3.69 U	3.93 U	4.96 U	4.91 U	10	820
Arsenic	1.97 U	**5.74**	**5.60**	**7.69**	2.62 U	**3.16**	**4.79**	**5.09**	**4.89**	**6.57**	2.16 U	2.6 U	**5.11**	**3.49**	**3.82**	**9.20**	**8.15**	**52.5**	**9.94**	**6.88**	**16.8**	**12.4**	7	7
Beryllium	**0.33**	**0.27**	**0.31**	**0.28**	**0.73**	**0.40**	**0.32**	**0.67**	**0.28**	**0.32**	**0.29**	**0.33**	**0.25**	**0.23**	**0.37**	**0.30**	**0.41**	0.05 U	**0.25**	**0.21**	**0.33**	**0.35**	1.5	1.5
Cadmium	0.39 U	0.52 U	0.18 U	0.41 U	0.52 U	0.4 U	0.45 U	0.54 U	0.2 U	0.52 U	0.43 U	0.52 U	0.46 U	0.42 U	0.33 U	0.47 U	0.24 U	2.46 U	0.37 U	0.39 U	0.5 U	0.49 U	39	1,000
Chromium	**9.53**	**12.8**	**12.1**	**15.6**	**12.1**	**14.0**	**11.5**	**20.1**	**8.99**	**10.8**	**4.25**	**7.43**	**6.59**	**7.88**	**4.95**	**9.32**	**9.59**	**17.2**	**7.00**	**7.48**	**14.3**	**14.1**	1,400	10,000
Copper	**10.4**	**22.2**	**24.7**	**17.7**	**11.4**	**14.3**	**23.8**	**14.4**	**25.5**	**25.7**	**6**	**8.64**	**10.6**	**18.8**	**7.56**	**23.1**	**20.7**	**327**	**6.78**	**5.93**	**37.5**	**37.5**	3,100	10,000
Lead	**14.1**	**53.2**	**85.4**	**60.8**	**8.02**	**27.8**	**90.3**	**60.6**	**51.6**	**51.4**	**5.87**	**7.03**	**20.7**	**35.7**	**6.43**	**28.9**	**21.8**	**153**	**5.41**	**5.02**	**68.0**	**67.8**	150	500
Mercury	**0.023**	**0.105**	**0.250**	**0.158**	0.016 U	**0.033**	**0.215**	0.025 U	**0.102**	**0.191**	0.029 U	0.033 U	**0.04**	**0.223**	0.027 U	**0.157**	**0.092**	**0.177**	0.027 U	0.031 U	**0.068**	**0.074**	23	610
Nickel	**8.15**	**11.5**	**10.7**	**12.1**	**9.89**	**11.5**	**8.35**	**14.1**	**8.26**	**9.12**	**5.96**	**8.49**	**8.41**	**9.14**	**6.77**	**9.50**	**9.89**	**105**	**9.00**	**8.62**	**14.6**	**16.3**	1,000	10,000
Selenium	3.93 U	5.19 U	0.18 U	4.06 U	5.24 U	3.98 U	4.49 U	5.37 U	1.97 U	5.2 U	4.33 U	5.2 U	4.56 U	4.16 U	3.29 U	4.75 U	2.39 U	**0.72**	3.69 U	3.93 U	0.5 U	0.49 U	390	10,000
Silver	0.39 U	0.52 U	0.36 U	0.41 U	0.52 U	0.4 U	0.45 U	0.54 U	0.2 U	0.52 U	0.43 U	0.52 U	0.46 U	0.42 U	0.33 U	0.47 U	0.48 U	2.46 U	0.37 U	0.39 U	0.5 U	0.49 U	200	10,000
Thallium	0.39 U	0.52 U	0.18 U	0.41 U	0.52 U	0.4 U	4.49 U	0.54 U	0.2 U	0.52 U	4.33 U	5.2 U	4.56 U	4.16 U	0.33 U	4.75 U	0.24 U	0.25 U	0.37 U	0.39 U	0.5 U	0.49 U	5.5	140
Zinc	**24.5**	**43.9**	**66.8**	**54.8**	**30.3**	**41.8**	**68.9**	**45.9**	**44.4**	**48.1**	**33.5**	**37.2**	**29.9**	**31.3**	**25.2**	**41.4**	**37.1**	**106**	**24.6**	**27.1**	**87.9**	**79.3**	6,000	10,000
Toxicity Characteristic Leaching Procedure Metals, mg/L																								
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.054**	NA	NA	NA	NA	5 (EPA)	
Polychlorinated Biphenyls, mg/kg																								
Aroclor 1262	0.06 U	0.05 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	0.06 U	**0.1**	10	10
Aroclor 1260	0.06 U	0.05 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	**0.2**	0.06 U	0.06 U	0.06 U	0.06 U	0.05 U	0.05 U	0.06 U	0.05 U	10	10
PCBs, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.2**	ND	ND	ND	ND	ND	ND	ND	**0.1**	10	10

Notes
Bold indicates detection above laboratory detection limit
Bold and yellow shading indicates exceedance of RIDEM RDEC
Bold and green shading indicates exceedance of RIDEM RDEC and I/CDEC
U - Analyte not detected above laboratory minimum detection limits
NE - Standard not established
NA - Not analyzed
ND - Not detected

GZA Soil Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	MW-314D	MW-314D	MW-341	TP-310	TP-318	TP-319	TP-320	TP-320A	TP-323	TP-324	TP-325	TP-326	TP-326	TP-327	TP-353	TP-354	TP-354A	TP-354B	TP-354B	TP-367	TP-374	RIDEM ResDEC	RIDEM ICDEC
Sample Depth	12-14 ft	16-18 ft	24-26 ft	0-2 ft	NA	0-2 ft	4-6 ft	4-6 ft	NA	NA	5-6 ft	0-2 ft	9-10 ft	1-2 ft	3-4 ft	3-4 ft	9-10 ft	7-8 ft Center	7-8 ft NE	8-9 ft	1-2 ft		
Sample Date	5/12/2010	5/12/2010	11/19/2010	6/15/2010	6/3/2010	6/3/2010	6/3/2010	6/3/2010	6/4/2010	6/4/2010	6/14/2010	6/4/2010	6/4/2010	6/15/2010	6/4/2010	6/4/2010	6/4/2010	6/7/2010	6/7/2010	6/4/2010	6/15/2010		
Volatile Organic Compounds, mg/kg																							
sec-Butylbenzene	-	-	-	-	NA	-	-	0.25	NA	NA	0.25	-	0.25	-	-	-	-	-	0.21	-	-	NE	NE
n-Butylbenzene	-	-	-	-	NA	-	-	0.97	NA	NA	0.62	-	0.41	-	-	-	3.8	-	1.4	-	-	NE	NE
Isopropylbenzene	-	-	-	-	NA	-	-	-	NA	NA	0.32	-	0.43	-	-	-	-	-	0.055	-	-	NE	NE
n-Propylbenzene	-	-	-	-	NA	-	-	-	NA	NA	-	-	0.33	-	-	-	-	-	0.17	-	-	NE	NE
Naphthalene	-	-	34	3.4	NA	1,300	-	-	NA	NA	-	1.3	-	490	-	-	-	-	-	-	1.7	54	10,000
Styrene	-	-	-	-	NA	-	-	-	NA	NA	-	-	-	-	29	140	-	-	-	-	-	13	190
Benzene	-	-	-	1.0	NA	-	11	2.2	NA	NA	-	-	-	-	44	160	-	-	-	-	-	2.5	200
Toluene	-	-	-	1.8	NA	22	-	-	NA	NA	-	5.6	-	-	56	220	-	-	-	-	-	190	10,000
p-Isopropyltoluene	-	-	-	-	NA	-	-	-	NA	NA	0.27	-	-	-	-	-	-	-	0.44	-	-	NE	NE
Ethylbenzene	-	-	-	0.023	NA	56	28	-	NA	NA	0.37	-	-	5.6	12	42	-	-	-	-	-	71	10,000
1,3,5-Trimethylbenzene	-	-	1.0	0.36	NA	11	7.8	-	NA	NA	0.38	0.16	-	-	18	63	5.8	-	0.53	-	-	NE	NE
1,2,4-Trimethylbenzene	-	-	3.1	0.73	NA	20	22	-	NA	NA	3.3	0.48	-	9.1	49	170	14	-	0.28	-	-	NE	NE
Xylene P,M	-	-	-	2.1	NA	37	15	-	NA	NA	-	0.87	-	-	72	280	-	-	-	-	-	NE	NE
Xylene O	-	-	-	0.66	NA	15	6.9	-	NA	NA	0.77	0.53	-	5.1	33	130	-	-	-	-	-	NE	NE
Total VOCs	-	-	38.1	10.1	NA	1,461	90.7	3.42	NA	NA	6.28	8.94	1.42	509.8	313	1,205	23.6	-	3.085	-	1.7	NE	NE
Semi-Volatile Organic Compounds, mg/kg																							
2-Methylnaphthalene	-	-	0.8	-	NA	150	260	0.51	NA	NA	36	2.9	-	400	240	310	33	-	72	-	-	35	10,000
Acenaphthylene	-	-	3.9	-	NA	160	33	1.5	NA	NA	-	1.8	0.93	45	160	160	100	-	99	-	0.84	23	10,000
Acenaphthene	-	-	-	-	NA	51	56	0.33	NA	NA	9.6	-	3.1	100	390	430	32	-	39	-	-	43	10,000
Anthracene	-	-	-	-	NA	460	37	1.9	NA	NA	5.2	1.3	1.8	96	780	970	92	-	110	-	0.94	35	10,000
Benzo(a)anthracene	-	-	-	-	NA	390	37	1.8	NA	NA	-	3	1.2	69	610	710	73	-	75	-	2.5	0.9	7.8
Benzo(a)pyrene	-	-	-	0.51	NA	300	22	1.3	NA	NA	-	2.4	0.65	45	420	440	50	-	50	-	2	0.4	0.8
Benzo(b)fluoranthene	-	-	-	0.66	NA	290	20	1.5	NA	NA	-	4.1	0.67	43	570	600	68	-	64	-	2.8	0.9	7.8
Benzo(g,h,i)perylene	-	-	-	0.49	NA	140	6.8	0.72	NA	NA	-	1.7	-	14	200	220	25	-	26	-	0.92	0.8	10,000
Benzo(k)fluoranthene	-	-	-	-	NA	72	6.1	0.49	NA	NA	-	1.3	-	16	200	-	25	-	25	-	1	0.9	78
Chrysene	-	-	-	-	NA	320	36	1.9	NA	NA	-	4.4	0.97	82	580	600	69	-	61	-	2.2	0.4	780
Dibenzo(a,h)Anthracene	-	-	-	-	NA	39	2.8		NA	NA	-	0.34	-	-	51	56	6.4	-	5.1	-	-	0.4	0.8
Fluorene	-	-	-	-	NA	85	76	2.5	NA	NA	7.4	-	2	160	980	1,300	100	-	130	-	0.45	28	10,000
Fluoranthene	-	-	-	-	NA	500	57	2.9	NA	NA	7.6	4.7	2.3	100	320	330	400	-	240	-	4.6	20	10,000
Indeno(1,2,3-cd)Pyrene	-	-	-	0.52	NA	130	7.7	0.81	NA	NA	-	1.8	-	15	250	260	31	-	30	-	1	0.9	7.8
Naphthalene	-	-	1.8	-	NA	160	670	1.9	NA	NA	-	2.4	0.33	830	890	120,000	90	-	1.3	-	0.8	54	10,000
Phenanthrene	-	-	0.8	-	NA	440	260	4.5	NA	NA	16	5.7	5.2	330	420	450	400	-	290	-	3.1	40	10,000
Pyrene	-	-	0.36	-	NA	970	81	3.7	NA	NA	12	5.1	3.5	160	230	1,500	290	-	170	-	4.3	13	10,000
Total SVOCs	-	-	7.7	2.2	NA	4,657	1,668.4	28	NA	NA	93.8	42.9	22.7	2,505	7,291	128,336	1,884.4	-	1,487	-	27.45	NE	NE
Total Petroleum Hydrocarbons, mg/kg																							
Total Petroleum Hydrocarbons	30	17	1,600	24	NA	14,000	4,100	1,800	NA	NA	14,000	730	4,300	50,000	160,000	110,000	9,800	13	12,000	59	300	500	2,500
Total Metals, mg/kg																							
Antimony	-	-	3.5	-	NA	2	-	2.0	NA	NA	-	-	-	-	-	-	-	-	-	2.8	2.6	10	820
Arsenic	2.5	2.0	6.8	3.3	NA	6.5	0.92	1.6	NA	NA	9.8	2.8	4.5	4.4	6.3	3.2	-	1.6	1.3	3.5	7	7	7
Beryllium	0.46	0.25	0.45	-	NA	0.58	0.52	0.46	NA	NA	0.28	0.46	-	0.36	0.35	-	0.65	-	0.28	8.7	0.37	1.5	1.5
Cadmium	-	-	0.70	0.7	NA	-	-	-	NA	NA	-	-	-	-	0.5	-	-	-	-	-	0.48	39	1,000
Chromium	10	9.2	17	19	NA	19	7.3	6.9	NA	NA	6	5	6	8.3	13	7.4	6.4	6.6	4.9	17	16	1,400	10,000
Copper	6.6	6.1	32	30	NA	110	8.6	8.7	NA	NA	13	35	11	17	19	21	11	8.2	8.1	19	27	3,100	10,000
Lead	7.2	4.4	12	75	NA	220	11	11	NA	NA	5	34	6.5	15	71	52	6.2	5.7	5.0	11	20	150	500
Mercury	-	-	-	0.4	NA	0.46	0.0074	-	NA	NA	-	0.076	0.0093	0.1	0.19	0.095	0.027	-	-	-	0.019	23	610
Nickel	9.6	12	23	9.4	NA	17	10	9.9	NA	NA	6.9	9	7	11	14	11	8	8.1	7.1	19	18	1,000	10,000
Selenium	-	-	-	-	NA	-	-	-	NA	NA	-	-	-	-	-	-	-	-	-	-	-	390	10,000
Silver	-	-	-	-	NA	-	-	-	NA	NA	-	-	-	-	-	-	-	-	-	-	-	200	10,000
Thallium	-	-	-	-	NA	-	-	-	NA	NA	-	-	-	-	-	-	-	-	-	-	-	5.5	140
Zinc	29	31	51	51	NA	93	25	28	NA	NA	19	38	21	33	87	81	27	25	20	51	48	6,000	10,000
Cyanide, mg/kg																							
Total Cyanide	-	-	-	-	NA	47	89	53	NA	NA	-	-	-	-	15	38	190	-	230	-	-	NE	10,000
Physically Available Cyanide	-	-	NA	-	NA	-	-	-	NA	NA	-	-	-	-	-	-	-	-	-	NA	-	NE	NE
Polychlorinated Biphenyls, mg/kg																							
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	10

Notes
Bold indicates detection above laboratory detection limit
Bold and yellow shading indicates exceedance of RIDEM RDEC
Bold and green shading indicates exceedance of RIDEM RDEC and I/CDEC
NE = Standard not established
NA = Not analyzed
- = Analyte not detected above laboratory minimum detection limits

GZA Soil Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	TP-374	TP-381A	TP-386A	TP-386B	TP-386B	SS-105	SS-109	SS-112	SS-113	SS-114	SS-115	SS-116	SS-117	SS-122	SS-123	SS-135	SS-136	SS-137	SS-138	SS-139	RIDEM ResDEC	RIDEM ICDEC
Sample Depth	10-11 ft	NA	NA	1.5-7.5 ft	9-10 ft NE	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft		
Sample Date	6/15/2010	11/9/2010	11/9/2010	11/9/2010	11/9/2010	12/28/2009	12/28/2009	12/29/2009	12/29/2009	12/29/2009	12/29/2009	12/29/2009	12/29/2009	1/4/2010	1/4/2010	1/4/2010	1/6/2010	1/6/2010	1/6/2010	1/6/2010		
Volatile Organic Compounds, mg/kg																						
sec-Butylbenzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
n-Butylbenzene	-	NA	NA	NA	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Isopropylbenzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
n-Propylbenzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Naphthalene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	10,000
Styrene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	190
Benzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	200
Toluene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190	10,000
p-Isopropyltoluene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Ethylbenzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	10,000
1,3,5-Trimethylbenzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
1,2,4-Trimethylbenzene	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Xylene P,M	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Xylene O	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Total VOCs	-	NA	NA	NA	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE
Semi-Volatile Organic Compounds, mg/kg																						
2-Methylnaphthalene	-	NA	NA	NA	0.86	1.5	1.2	-	-	-	1.5	2.1	-	4.6	3.7	-	-	-	-	-	35	10,000
Acenaphthylene	2.8	NA	NA	NA	2.7	16	3.9	-	-	-	3.1	9.8	-	16	10	-	-	-	3.6	-	23	10,000
Acenaphthene	-	NA	NA	NA	1.3	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	43	10,000
Anthracene	6.9	NA	NA	NA	3.6	6.9	2.2	2.2	-	-	1.7	3.7	-	11	4.9	-	-	-	3.7	-	35	10,000
Benzo(a)anthracene	4.5	NA	NA	NA	2	24	6.8	3.8	-	-	7	12	-	27	17	-	-	0.45	7.6	1.5	0.9	7.8
Benzo(a)pyrene	4.1	NA	NA	NA	0.93	27	4.6	3.2	-	-	7	10	-	33	25	-	-	0.74	8.2	1.1	0.4	0.8
Benzo(b)fluoranthene	4	NA	NA	NA	1.3	32	8	3.9	-	-	10	14	0.58	42	30	-	-	0.82	9.5	2.5	0.9	7.8
Benzo(g,h,i)perylene	1.5	NA	NA	NA	-	18	2.6	1.9	-	-	5.1	7.4	-	15	17	-	-	0.61	6.9	1.4	0.8	10,000
Benzo(k)fluoranthene	1.4	NA	NA	NA	-	18	4.8	1.6	-	-	4.4	7.6	-	16	35	-	-	-	4.7	-	0.9	78
Chrysene	4.7	NA	NA	NA	1.7	34	8.7	3.4	-	-	6.8	14	0.40	35	21	-	-	0.43	8	1.4	0.4	780
Dibenzo(a,h)Anthracene	0.49	NA	NA	NA	-	5.2	-	-	-	-	1.4	2.6	-	6.3	5.7	-	-	-	1.7	-	0.4	0.8
Fluorene	0.4	NA	NA	NA	4.9	1.4	-	1.1	-	-	-	-	-	2.7	1.0	-	-	-	2.0	-	28	10,000
Fluoranthene	8.9	NA	NA	NA	3.5	28	14	10	-	-	12	16	0.46	49	22	0.38	-	-	18	1.8	20	10,000
Indeno(1,2,3-cd)Pyrene	1.7	NA	NA	NA	-	19	3	1.7	-	-	5	7.3	-	14	16	-	-	0.49	6.1	1.3	0.9	7.8
Naphthalene	-	NA	NA	NA	0.11	4.3	2	1.1	-	1.1	7.5	4.7	-	8.8	6.1	-	-	-	2.6	1.7	54	10,000
Phenanthrene	6.6	NA	NA	NA	11	7.2	6.2	9.6	-	-	5.2	5.6	-	29	9.5	-	-	-	11	-	40	10,000
Pyrene	9.5	NA	NA	NA	3.3	37	13	8.6	-	-	13	23	0.42	57	33	-	-	0.84	16	1.7	13	10,000
Total SVOCs	57.49	NA	NA	NA	37.2	279.5	81	53.4	-	-	90.7	139.8	1.86	366.4	256.9	0.38	-	4.38	109.6	14.4	NE	NE
Total Petroleum Hydrocarbons, mg/kg																						
Total Petroleum Hydrocarbons	500	NA	NA	140,000	380	800	330	180	160	140	310	2,000	80	4,600	2,000	51	150	94	1,100	1,500	500	2,500
Total Metals, mg/kg																						
Antimony	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	820
Arsenic	-	NA	NA	NA	1.1	5.7	6.8	8.3	3.4	6.0	8.8	9.9	3.1	5.5	9.0	4.7	2.9	4.1	7.3	14	7	7
Beryllium	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.5
Cadmium	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	1,000
Chromium	-	NA	NA	NA	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,400	10,000
Copper	-	NA	NA	NA	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,100	10,000
Lead	-	NA	NA	NA	5	100	62	310	170	390	1,300	880	190	190	1,400	150	540	370	5,900	2,200	150	500
Mercury	-	NA	NA	NA	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	610
Nickel	-	NA	NA	NA	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,000	10,000
Selenium	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	10,000
Silver	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	10,000
Thallium	-	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.5	140
Zinc	-	NA	NA	NA	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	10,000
Cyanide, mg/kg																						
Total Cyanide	-	NA	NA	NA	38	17	14	2.2	-	-	110	530	200	16	51	-	-	-	37	280	NE	10,000
Physically Available Cyanide	-	NA	NA	NA	-	5.7	3	-	-	-	4.6	41	6.1	4.7	12	-	-	-	13	31	NE	NE
Polychlorinated Biphenyls, mg/kg																						
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	1.6	-	NA	NA	-	0.11	-	-	-	10	10

Notes
Bold indicates detection above laboratory detection limit
Bold and yellow shading indicates exceedance of RIDEM RDEC
Bold and green shading indicates exceedance of RIDEM RDEC and I/CDEC
NE = Standard not established
NA = Not analyzed
- = Analyte not detected above laboratory minimum detection limits

GZA Groundwater Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	M+E MW-1		MW-3		MW-5	MW-7												MW-109				MW-201					RIDEM GB	RIDEM GB	NBC Bucklin Point	NBC Bucklin Point
Sample Date	**1/18/2010**	**6/30/2010**	**1/14/2010**	**7/2/2010**	**1/18/2010**	**1996**	**2006**	**1/18/2010**	**7/7/2010**	**Jul-11**	**Jul-12**	**Aug-13**	**Oct-14**	**Nov-15**	**Nov-16**	**Oct-17**	**10/25/2018**	**2006**	**1/20/2010**	**10/15/2019**	**10/21/2020**	**2006**	**1/14/2010**	**6/30/2010**	**10/15/2019**	**10/21/2020**	**UCL**	**Objective**	**Daily Maximum**	**Monthly Average**
Volatile Organic Compounds, µg/L																														
sec-Butylbenzene	-	-	-	-	-	NA	-	-	-	-	-	-	-	-	-	-	-	**5.6**	**2.5**	**2.0**	**1.8**	**3.1**	**2.4**	**2.4**	**1.5**	-	NE	NE	NE	NE
n-Butylbenzene	-	-	-	**1.2**	-	NA	-	-	-	-	-	-	-	-	-	-	-	-	**9.0**	**4.5**	**4.9**	-	**6.7**	**6.2**	**4.0**	**2.3**	NE	NE	NE	NE
Isopropylbenzene	-	-	**6.8**	**4.8**	-	NA	NA	-	-	-	-	-	-	-	-	-	-	**41.8**	**38**	**17.0**	**16.6**	**16.4**	**25**	**20**	**18.0**	**9.7**	NE	NE	NE	NE
n-Propylbenzene	-	-	**1.3**	**1.7**	-	NA	-	-	-	-	-	-	-	-	-	-	-	**21.7**	**17**	**8.9**	**8.0**	**14.9**	**18**	**18**	**12.9**	**6.9**	NE	NE	NE	NE
Chloroform	-	-	-	-	-	NA	**4.8**	-	-	-	-	**1.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Naphthalene	-	-	-	**16**	-	NA	-	-	-	-	-	-	-	-	-	-	-	**724**	**410**	**89.2**	**54.5**	**2.8**	**19**	**20**	**87.4**	**22.5**	NE	2,670	NE	NE
Acetone	-	-	-	-	-	NA	NA	-	**3.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Styrene	-	-	-	-	-	-	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1.5**	**1.9**	50,000	2,200	NE	NE
Benzene	**2.1**	**3.2**	**2.5**	**2.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	**35.2**	**39**	**33**	**43.4**	**4.7**	**32**	**50**	**104**	**69.6**	18,000	140	NE	NE
Toluene	-	-	-	-	-	-	NA	-	-	-	-	-	-	-	-	-	-	**5.8**	**2.8**	**1.8**	**1.6**	**1.8**	-	**2.4**	-	-	21,000	1,700	NE	NE
p-Isopropyltoluene	-	-	-	-	-	NA	-	-	-	-	-	-	-	-	-	-	-	-	**8.9**	**1.6**	-	-	-	-	-	-	NE	NE	NE	NE
Ethylbenzene	-	-	**1.6**	**6.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	**177**	**86**	**12.4**	**7.7**	**22.8**	**55**	**64**	**27.6**	**6.2**	16,000	1,600	NE	NE
1,3,5-Trimethylbenzene	-	-	-	**2.0**	-	NA	-	-	-	-	-	-	-	-	-	-	-	**47**	**17**	**3.7**	-	**2.4**	-	-	**2.4**	-	NE	NE	NE	NE
1,2,4-Trimethylbenzene	-	-	-	**9.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	**454**	**270**	**55.8**	**24.1**	**90.7**	**17**	**9.4**	**20.7**	-	NE	NE	NE	NE
Xylene P,M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**87.5**	**26**	**6.4**	**2.5**	**2.4**	-	-	**5.4**	**2.8**	NE	NE	NE	NE
Xylene O	-	-	**2.5**	**8.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	**87.5**	**31**	**12.6**	**7.4**	**11.3**	**21**	**6.2**	**13.5**	**9.6**	NE	NE	NE	NE
Total VOCs	**2.1**	**3.2**	**14.7**	**53.8**	-	-	**4.8**	-	**3.5**	-	-	**1.8**	-	-	-	-	-	**1687.1**	**957.2**	**248.9**	**172.5**	**173.3**	**196.1**	**198.6**	**298.9**	**131.5**	NE	NE	NE	NE
Semi-Volatile Organic Compounds, µg/L																														
2-Methylnaphthalene	-	-	-	**9.5**	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**73**	**26**	NA	NA	**0.76**	-	**6.8**	NA	NA	NE	NE	NE	NE
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**1.24**	**2.7**	NA	NA	**2.09**	-	-	NA	NA	NE	NE	NE	NE
Acenaphthene	-	**2.5**	**6.9**	**5.9**	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**5.83**	-	NA	NA	**8.8**	**5.2**	-	NA	NA	NE	NE	NE	NE
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**0.65**	-	NA	NA	**3.5**	-	-	NA	NA	NE	NE	NE	NE
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**1.02**	-	-	NA	NA	NE	NE	NE	NE
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**0.85**	-	-	NA	NA	NE	NE	NE	NE
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**0.51**	-	-	NA	NA	NE	NE	NE	NE
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**0.35**	-	-	NA	NA	NE	NE	NE	NE
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**0.63**	-	-	NA	NA	NE	NE	NE	NE
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**1.12**	-	-	NA	NA	NE	NE	NE	NE
Dibenza(a,h)Anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**0.23**	-	-	NA	NA	NE	NE	NE	NE
Fluorene	**2.1**	**2.7**	**2.5**	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**3.36**	-	NA	NA	**14**	**11**	-	NA	NA	NE	NE	NE	NE
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**0.33**	-	NA	NA	**5.03**	-	-	NA	NA	NE	NE	NE	NE
Indeno(1,2,3-cd)Pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	NA	NA	**0.39**	-	-	NA	NA	NE	NE	NE	NE
Naphthalene	-	-	-	**7.3**	-	-	-	-	-	-	**1**	**0.4**	**1.2**	NA	NA	NA	NA	**602**	**100**	NA	NA	**12**	**6.9**	-	NA	NA	NE	2,670	NE	NE
Phenanthrene	**2.5**	**3.3**	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**3.17**	-	NA	NA	**12**	**8.5**	-	NA	NA	NE	NE	NE	NE
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	NA	**0.31**	-	NA	NA	**3.56**	-	-	NA	NA	NE	NE	NE	NE
Total SVOCs	**4.6**	**8.5**	**9.4**	**22.7**	-	-	-	-	-	-	**1**	**0.4**	**1.2**	NA	NA	NA	NA	**689.9**	**128.7**	NA	NA	**66.8**	**31.6**	**6.8**	NA	NA	NE	NE	NE	NE
Total Petroleum Hydrocarbons, µg/L																														
Total Petroleum Hydrocarbons	**430**	**1,100**	**2,500**	**3,100**	-	NA	NA	-	-	-	-	-	-	NA	NA	NA	NA	NA	**1100**	NA	NA	-	**660**	-	NA	NA	NE	NE	NE	NE
Total Metals, µg/L																														
Arsenic	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**10.3**	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	200	100
Beryllium	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Chromium	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	2,770	1,630
Copper	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	1,200	1,200
Lead	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	**18.1**	NA	NA	NA	NA	NE	NE	690	290
Nickel	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	1,620	1,620
Zinc	NA	NA	NA	NA	NA	**0.023**	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	1,670	1,390
Dissolved Arsenic	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**8.5**	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Beryllium	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Chromium	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Copper	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Lead	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Nickel	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Zinc	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**51**	NA	NA	NA	-	NA	NA	NA	NA	NE	NE	NE	NE
Cyanide, mg/L																														
Total Cyanide	**0.19**	**0.30**	**0.06**	**0.056**	**0.020**	-	-	NA	NA	**0.02**	**0.0205**	**0.0316**	**0.0454**	NA	NA	NA	NA	**0.222**	**0.28**	NA	NA	**2.52**	**4.1**	**3.5**	NA	NA	NE	NE	0.5	0.5
Physically Available Cyanide	-	**0.010**	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-	NA	NA	**0.215**	**0.02**	**0.15**	NA	NA	NE	NE	NE	NE

Notes
Bold indicates detection above laboratory detection limit
Bold and yellow shading indicates exceedance of RIDEM GB Objective
Bold and green shading indicates exceedance of RIDEM GB Upper Concentration Limit
Bold and blue shading indicates exceedance of NBC Bucklin Point Daily Maximum Standard
Bold and orange shading indicates exceedance of NBC Bucklin Point Monthly Average Standard
NE = Standard not established
NA = Not analyzed
- = Analyte not detected above laboratory minimum detection limits

GZA Groundwater Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	MW-206	MW-208											MW-209		MW-314S									RIDEM GB	RIDEM GB	NBC Bucklin Point	NBC Bucklin Point
Sample Date	1/18/2010	2006	1/18/2010	6/30/2010	Jul-11	Jul-12	Aug-13	Oct-14	Nov-15	Nov-16	Oct-17	10/25/2018	1/18/2010	6/30/2010	6/28/2010	Jul-11	Jul-12	Aug-13	Oct-14	Nov-15	Nov-16	Oct-17	10/23/2018	UCL	Objective	Daily Maximum	Monthly Average
Volatile Organic Compounds, µg/L																											
sec-Butylbenzene	-	9.2	7.4	-	6.8	7.7	6.6	3.2	2.4	2.6	3.3	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
n-Butylbenzene	-	-	15	1.2	7.6	15.4	13.2	-	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Isopropylbenzene	-	12.6	11	-	-	-		-	-	-	-	-	12	-	1.6	1.6	2.8	-	-	-	-	-	3.8	NE	NE	NE	NE
n-Propylbenzene	-	7.5	9.0	-	2.1	1.9	1.2	-	-	-	-	-	4.6	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Chloroform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Naphthalene	-	1.4	2.3	-	2.1	2.8	-	-	18.7	-	-	-	270	24	4.1	-	8.3	-	1.4	-	-	-	4.4	NE	2,670	NE	NE
Acetone	-	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Styrene	-	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50,000	2,200	NE	NE
Benzene	-	1.6	4.0	-	-	1.7	-	1.6	3.2	1	-	-	1	2.3	-	-	-	-	-	-	-	-	-	18,000	140	NE	NE
Toluene	-	-	1.7	-	-	-	-	-	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-	-	21,000	1,700	NE	NE
p-Isopropyltoluene	-	NA	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Ethylbenzene	-	1.2	3.3	-	3.7	5	9.6	-	1.2	-	-	-	21	1.3	-	-	-	-	-	-	-	-	1.6	16,000	1,600	NE	NE
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	6.1	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	22	2.1	1.7	-	5.3	-	-	-	-	-	4.6	NE	NE	NE	NE
Xylene P,M	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Xylene O	-	3.6	2.5	-	2	3.9	4.4	-	1	-	-	-	30	1.3	4.1	-	5.2	-	-	-	-	-	14.2	NE	NE	NE	NE
Total VOCs	-	37.1	57.6	1.2	24.3	38.4	35.0	4.8	26.5	7.0	3.3	-	385.3	31.0	11.5	1.6	21.6	-	1.4	-	-	-	28.6	NE	NE	NE	NE
Semi-Volatile Organic Compounds, µg/L																											
2-Methylnaphthalene	-	-	-	33	-	-	-	0.2	NA	NA	NA	NA	-	-	-	-	0.3	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Acenaphthylene	-	1.3	-	-	-	2	2	0.5	NA	NA	NA	NA	13	2.9	-	-	0.6	0.4	-	NA	NA	NA	NA	NE	NE	NE	NE
Acenaphthene	-	1.56	-	6.7	-	3	2.3	1.4	NA	NA	NA	NA	29	8.4	2.9	-	3	2.5	1.3	NA	NA	NA	NA	NE	NE	NE	NE
Anthracene	-	-	-	-	-	0.5	0.5	0.2	NA	NA	NA	NA	4.7	24	-	-	0.5	0.4	-	NA	NA	NA	NA	NE	NE	NE	NE
Benzo(a)anthracene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Benzo(a)pyrene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Chrysene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Dibenzo(a,h)Anthracene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Fluorene	-	1.39	-	11	-	2	1.5	2	NA	NA	NA	NA	29	7.4	-	-	1	0.8	0.3	NA	NA	NA	NA	NE	NE	NE	NE
Fluoranthene	-	-	-	-	-	0.3	0.2	-	NA	NA	NA	NA	4.1	2.7	-	-	0.2	0.3	-	NA	NA	NA	NA	NE	NE	NE	NE
Indeno(1,2,3-cd)Pyrene	-	-	-	-	-	-	-	-	NA	NA	NA	NA	-	-	-	-	-	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Naphthalene	-	0.94	-	7.6	-	2	1.3	4.7	NA	NA	NA	NA	91	13	-	-	4	0.3	-	NA	NA	NA	NA	NE	2,670	NE	NE
Phenanthrene	-	0.74	-	10	-	2	2	1.2	NA	NA	NA	NA	38	23	-	-	0.5	-	-	NA	NA	NA	NA	NE	NE	NE	NE
Pyrene	-	0.27	-	-	-	0.5	0.3	0.2	NA	NA	NA	NA	4.7	3.3	-	-	0.3	0.4	0.3	NA	NA	NA	NA	NE	NE	NE	NE
Total SVOCs	-	6.2	-	68.3	-	12.3	10.1	10.4	NA	NA	NA	NA	213.5	84.7	2.9	-	10.4	5.1	1.9	NA	NA	NA	NA	NE	NE	NE	NE
Total Petroleum Hydrocarbons, µg/L																											
Total Petroleum Hydrocarbons	-	NA	570	800	310	1,000	900	480	NA	NA	NA	NA	1,100	230	1,200	1,400	4,650	2,080	570	NA	NA	NA	NA	NE	NE	NE	NE
Total Metals, µg/L																											
Arsenic	-	15.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	200	100
Beryllium	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Chromium	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	2,770	1,630
Copper	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	1,200	1,200
Lead	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	690	290
Nickel	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	1,620	1,620
Zinc	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	1,670	1,390
Dissolved Arsenic	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Beryllium	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Chromium	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Copper	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Lead	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Nickel	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Zinc	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Cyanide, mg/L																											
Total Cyanide	-	0.170	0.010	0.050	0.030	0.0299	0.0302	0.108	NA	NA	NA	NA	0.17	0.21	0.20	0.10	0.0637	0.0902	0.176	NA	NA	NA	NA	NE	NE	0.5	0.5
Physically Available Cyanide	-	0.073	-	-	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE

Notes
Bold indicates detection above laboratory detection limit
Bold and yellow shading indicates exceedance of RIDEM GB Objective
Bold and green shading indicates exceedance of RIDEM GB Upper Concentration Limit
Bold and blue shading indicates exceedance of NBC Bucklin Point Daily Maximum Standard
Bold and orange shading indicates exceedance of NBC Bucklin Point Monthly Average Standard
NE = Standard not established
NA = Not analyzed
- = Analyte not detected above laboratory minimum detection limits

GZA Groundwater Analytical Results
NBC Phase III CSO Program Consolidation Conduits - Phase IIA-4 and IIIA-5
Pawtucket, Rhode Island

Sample Designation	MW-314D									MW-341	MW-341 DUP	RIDEM GB	RIDEM GB	NBC Bucklin Point	NBC Bucklin Point
Sample Date	6/29/2010	Jul-11	Jul-12	Aug-13	Oct-14	Nov-15	Nov-16	Oct-17	10/23/2018	12/10/2010	12/10/2010	UCL	Objective	Daily Maximum	Monthly Average
Volatile Organic Compounds, µg/L															
sec-Butylbenzene	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
n-Butylbenzene	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Isopropylbenzene	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
n-Propylbenzene	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Chloroform	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Naphthalene	**2.3**	-	-	-	-	-	-	-	-	**3,900**	**3,800**	NE	2,670	NE	NE
Acetone	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Styrene	-	-	-	-	-	-	-	-	-	**1,200**	**1,200**	50,000	2,200	NE	NE
Benzene	**1.6**	**1**	-	-	-	-	-	-	-	-	-	18,000	140	NE	NE
Toluene	-	-	-	-	-	-	-	-	-	**1,000**	**980**	21,000	1,700	NE	NE
p-Isopropyltoluene	-	-	-	-	-	-	-	-	-	-	-	NE	NE	NE	NE
Ethylbenzene	-	-	-	-	-	-	-	-	-	**330**	**330**	16,000	1,600	NE	NE
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	**140**	**150**	NE	NE	NE	NE
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	**550**	**540**	NE	NE	NE	NE
Xylene P,M	-	-	-	-	-	-	**36.6**	-	-	**2,000**	**2,000**	NE	NE	NE	NE
Xylene O	-	-	-	-	-	-	**16.5**	-	-	**910**	**920**	NE	NE	NE	NE
Total VOCs	**3.9**	**1**	-	-	-	-	**53.1**	-	-	**10,030**	**9,920**	NE	NE	NE	NE
Semi-Volatile Organic Compounds, µg/L															
2-Methylnaphthalene	-	-	-	-	-	NA	NA	NA	NA	**240**	**270**	NE	NE	NE	NE
Acenaphthylene	-	-	**0.3**	**0.2**	-	NA	NA	NA	NA	**110**	**120**	NE	NE	NE	NE
Acenaphthene	**3.7**	**2.7**	**3**	**3.1**	**1.3**	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Anthracene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Benzo(a)anthracene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Benzo(a)pyrene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Benzo(b)fluoranthene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Benzo(g,h,i)perylene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Benzo(k)fluoranthene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Chrysene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Dibenzo(a,h)Anthracene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Fluorene	-	-	**0.4**	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Fluoranthene	-	-	**0.2**	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Indeno(1,2,3-cd)Pyrene	-	-	-	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Naphthalene	-	-	**4**	**0.4**	-	NA	NA	NA	NA	**2,000**	**2,100**	NE	2,670	NE	NE
Phenanthrene	**2**	-	**0.2**	-	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Pyrene	-	-	**0.3**	**0.2**	-	NA	NA	NA	NA	-	-	NE	NE	NE	NE
Total SVOCs	**5.7**	**2.7**	**8.4**	**3.9**	**1.3**	NA	NA	NA	NA	**2,350**	**2,490**	NE	NE	NE	NE
Total Petroleum Hydrocarbons, µg/L															
Total Petroleum Hydrocarbons	-	**330**	**1,690**	**530**	**370**	NA	NA	NA	NA	**12,000**	**14,000**	NE	NE	NE	NE
Total Metals, µg/L															
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	200	100
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	2,770	1,630
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	1,200	1,200
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	690	290
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	1,620	1,620
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	1,670	1,390
Dissolved Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Dissolved Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE
Cyanide, mg/L															
Total Cyanide	**0.46**	**0.32**	**0.1440**	**0.317**	**0.16**	NA	NA	NA	NA	**0.01**	-	NE	NE	0.5	0.5
Physically Available Cyanide	-	NA	NA	NA	NA	NA	NA	NA	NA	-	-	NE	NE	NE	NE

Notes
Bold indicates detection above laboratory detection limit
Bold and yellow shading indicates exceedance of RIDEM GB Objective
Bold and green shading indicates exceedance of RIDEM GB Upper Concentration Limit
Bold and blue shading indicates exceedance of NBC Bucklin Point Daily Maximum Standard
Bold and orange shading indicates exceedance of NBC Bucklin Point Monthly Average Standard
NE = Standard not established
NA = Not analyzed
- = Analyte not detected above laboratory minimum detection limits

FUSS & O'NEILL

Table 5
Summary of Soil Analytical Data
Collected August 30 and September 6, 2011

Town Landing
Pawtucket, Rhode Island

Site Investigation Report/Targeted Brownfields Assessment
Prepared for RIDEM

April 2013

	Location	MW-01		MW-02		MW-03		SB-04		MW-05		**RIDEM Regulatory Criteria**		**RIDEM Reference Criteria**	
	Sample Number	0906-16	0906-17	0830-11	0830-12	0830-09	0830-10	0830-07	0830-08	0830-05	0830-06				
	Sample Date	9/6/2011	9/6/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011				
	Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary				
	Sample Depth (fbg)	0-5	5-10	0-3	5-10	2-5	5-8	0.5-5	5-7	1-5	7-10	R-DEC	GB-LC	I/C-DEC	GA-LC
Total Metals (USEPA Method 6010B/7471)	Units														
Arsenic	mg/Kg	6.0	2.6	**20**	**7.1**	**13**	1.5	2.9	3.1	2.9	2.9	7.0	NE	7.0	NE
Barium	mg/Kg	55	40	88	22	36	20	30	39	26	24	5,500	NE	10,000	NE
Beryllium	mg/Kg	0.17	0.21	0.22	0.39	0.23	0.46	0.16	0.21	0.32	0.39	1.5	NE	1.5	NE
Cadmium	mg/Kg	0.74	1.1	1.5	0.97	1.1	1.1	0.50	0.71	0.68	0.76	39	NE	1,000	NE
Chromium	mg/Kg	9.2	10	9.4	34	5.1	5.9	5.5	13	6.9	8.3	390	NE	10,000	NE
Copper	mg/Kg	35	11	48	41	48	52	15	29	15	12	3,100	NE	10,000	NE
Lead	mg/Kg	120	7.2	**260**	50	81	19	52	**220**	29	10	150	NE	500	NE
Manganese	mg/Kg	140	**870**	110	380	**510**	360	170	290	350	350	390	NE	10,000	NE
Mercury	mg/Kg	0.47	ND <0.022	0.088	0.036	0.026	ND <0.022	0.13	0.070	ND <0.023	ND <0.023	23	NE	610	NE
Nickel	mg/Kg	10	14	12	10	13	18	5.2	10	12	11	1,000	NE	10,000	NE
Selenium	mg/Kg	ND <0.30	ND <0.27	ND <0.33	ND <0.33	ND <0.28	ND <0.28	ND <0.28	ND <0.32	ND <0.28	ND <0.29	390	NE	10,000	NE
Silver	mg/Kg	ND <0.12	ND <0.11	0.32	ND <0.13	ND <0.11	ND <0.11	ND <0.11	ND <0.13	ND <0.11	ND <0.11	200	NE	10,000	NE
Vanadium	mg/Kg	22	10	31	16	13	6.0	7.6	7.0	8.5	7.8	550	NE	10,000	NE
Zinc	mg/Kg	60	37	160	41	51	67	53	87	40	32	6,000	NE	10,000	NE
SPLP Metals (USEPA Method 1312/6010B)															
Lead	mg/L	NA	NA	*0.68*	NA	NA	NA	NA	*0.046*	NA	NA	NE	NE	NE	0.04
Mercury	mg/L	0.00074	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	0.02
Total Cyanide (USEPA Method 9012)	mg/Kg	ND<0.59	ND<0.54	ND<0.66	ND<0.66	ND<0.57	ND<0.55	ND<0.57	ND<0.65	ND<0.56	ND<0.57	200	NE	10,000	NE
PCB Aroclors (USEPA Method 8082)															
Aroclor 1260	µg/Kg	ND <79	ND <14	480	ND <18	ND <15	ND <15	78	ND <17	ND <15	ND <15	10,000	10,000	10,000	10,000
TPH (USEPA Method 8100)															
C10-C28 Medium Petroleum Distillate	mg/Kg	ND <12	ND <11	160	ND <13	ND <11	ND <11	ND <11	ND <13	ND <11	ND <11	NE	NE	NE	NE
C16-C36 Heavy Petroleum Distillate	mg/Kg	260	ND <11	410	15	44	ND <11	140	29	440	23	NE	NE	NE	NE
Total Petroleum Hydrocarbons*	mg/Kg	260	ND <11	**570**	15	44	ND <11	140	29	440	23	500	2,500	2,500	500
VOC (USEPA Method 8260B)															
Acetone	µg/Kg	ND <16	ND <11	52	78	ND <12	ND <8.6	ND <11	29	39	16	7,800,000	NE	10,000,000	NE
Tetrachloroethene (PCE)	µg/Kg	12	ND <5.4	*110*	35	50	6.3	37	30	74	18	12,000	4,200	110,000	100
SVOC (USEPA Method 8270C)															
Anthracene	µg/Kg	ND <400	ND <180	ND <2,200	ND <220	ND <380	ND <180	**45,000**	ND <220	ND <380	ND <380	35,000	NE	10,000,000	NE
Biphenyl	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	800	NE	10,000,000	NE
Benzo(a)anthracene	µg/Kg	650	ND <180	***ND <2,200***	ND <220	400	ND <180	**53,000**	370	**1,600**	ND <380	900	NE	7,800	NE
Benzo(a)pyrene	µg/Kg	**680**	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	**42,000**	370	**950**	ND <380	400	NE	800	240,000
Benzo(b)fluoranthene	µg/Kg	880	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	**40,000**	280	**1,100**	ND <380	900	NE	7,800	NE
Benzo(ghi)perylene	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	430	ND <380	800	NE	10,000,000	NE
Benzo(k)fluoranthene	µg/Kg	740	ND <180	**2,200**	ND <220	ND <380	ND <180	**43,000**	320	**1,200**	ND <380	900	NE	78,000	NE
Bis(2-chloroethyl)ether	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	600	NE	5,200	NE
Bis(2-chloroisopropyl)ether	µg/Kg	ND <790	ND <360	ND <4,400	ND <440	ND <760	ND <370	***ND <30,000***	ND <430	ND <750	ND <760	9,100	NE	82,000	NE
Chrysene	µg/Kg	**920**	ND <180	**2,600**	ND <220	**510**	ND <180	**50,000**	360	**1,800**	ND <380	400	NE	780,000	NE
Dibenzo(ah)anthracene	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	400	NE	800	NE
3,3-Dichlorobenzidine	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	1,400	NE	13,000	NE
2,4-Dinitrotoluene	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	900	NE	8,400	NE
Fluoranthene	µg/Kg	1,200	ND <180	3,800	260	670	ND <180	**130,000**	670	3,500	ND <380	20,000	NE	10,000,000	NE
Fluorene	µg/Kg	ND <400	ND <180	ND <2,200	ND <220	ND <380	ND <180	21,000	ND <220	ND <380	ND <380	28,000	NE	10,000,000	NE
Hexachlorobenzne	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	400	NE	3,600	NE
Hexachlorobutadiene	µg/Kg	ND <400	ND <180	ND <2,200	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	8,200	NE	73,000	NE
Indeno (1,2,3-cd)pyrene	µg/Kg	ND <400	ND <180	***ND <2,200***	ND <220	ND <380	ND <180	**17,000**	250	470	ND <380	900	NE	7,800	NE
2-Methylnaphthalene	µg/Kg	ND <400	ND <180	3,000	ND <220	ND <380	ND <180	ND <15,000	ND <220	ND <380	ND <380	123,000	NE	10,000,000	NE
Pentachlorophenol	µg/Kg	ND <400	ND <180	ND <2,200	ND <220	ND <380	ND <180	***ND <15,000***	ND <220	ND <380	ND <380	5,300	NE	48,000	7,100
Phenanthrene	µg/Kg	900	ND <180	3,700	ND <220	510	ND <180	**140,000**	430	1,400	ND <380	40,000	NE	10,000,000	NE
Pyrene	µg/Kg	1,800	ND <180	6,800	ND <220	590	ND <180	**160,000**	680	6,000	ND <380	13,000	NE	10,000,000	NE

FUSS & O'NEILL

Table 5 (continued)
Summary of Analytical and Objectives in Soil Samples

	Location	MW-06			SB-07	SB-08	MW-09		SS-01		SS-02	SS-03	RIDEM Regulatory Criteria		RIDEM Reference Criteria	
	Sample Number	0830-02	0830-03	0830-04	0906-15	0830-01	0906-18	0906-19	0906-20	0906-21	0906-22	0906-23				
	Sample Date	8/30/2011	8/30/2011	8/30/2011	9/6/2011	8/30/2011	9/6/2011	9/6/2011	9/6/2011	9/6/2011	9/6/2011	9/6/2011				
	Sample Type	Primary	Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Primary	Primary	R-DEC	GB-LC	I/C-DEC	GA-LC
	Sample Depth (fbg)	0.5-4	0.5-4	25-27	0-4	0.5-4	0-3	10.5-14	0-0.5	0-0.5	0-0.5	0-0.5				
Total Metals (USEPA Method 6010B/7471)	Units															
Arsenic	mg/Kg	3.4	5.9	4.4	6.2	2.8	**59**	6.9	3.7	3.9	4.3	3.1	7.0	NE	7.0	NE
Barium	mg/Kg	11	11	14	70	16	58	27	33	67	49	42	5,500	NE	10,000	NE
Beryllium	mg/Kg	0.18	0.24	0.28	0.31	0.20	0.41	0.42	0.11	0.13	0.29	0.14	1.5	NE	1.5	NE
Cadmium	mg/Kg	0.38	0.53	1.1	0.72	0.43	1.6	0.88	0.62	0.75	0.97	0.68	39	NE	1,000	NE
Chromium	mg/Kg	7.4	7.8	14	13	6.1	9.6	9.5	5.7	7.0	10	7.7	390	NE	10,000	NE
Copper	mg/Kg	5.8	5.8	18	18	5.7	38	15	18	23	24	14	3,100	NE	10,000	NE
Lead	mg/Kg	3.0	2.8	10	**190**	4.5	77	5.7	**230**	**340**	**170**	110	150	NE	500	NE
Manganese	mg/Kg	100	130	**460**	300	190	83	260	140	150	250	230	390	NE	10,000	NE
Mercury	mg/Kg	ND <0.024	ND <0.023	ND <0.022	5.5	ND <0.020	0.062	ND <0.026	0.068	0.12	0.16	0.083	23	NE	610	NE
Nickel	mg/Kg	5.2	4.9	19	8.2	6.7	9.2	12	7.2	7.7	12	8.1	1,000	NE	10,000	NE
Selenium	mg/Kg	ND <0.30	ND <0.29	ND <0.27	ND <0.30	ND <0.26	2.2	ND <0.33	ND <0.28	ND <0.28	ND <0.30	ND <0.28	390	NE	10,000	NE
Silver	mg/Kg	ND <0.12	ND <0.12	ND <0.11	ND <0.12	ND <0.10	0.22	ND <0.13	ND <0.11	ND <0.11	ND <0.12	ND <0.11	200	NE	10,000	NE
Vanadium	mg/Kg	11	15	12	13	6.6	19	13	13	16	16	12	550	NE	10,000	NE
Zinc	mg/Kg	17	14	43	75	21	48	35	73	79	150	76	6,000	NE	10,000	NE
SPLP Metals (USEPA Method 1312/6010B)																
Lead	mg/L	NA	NA	NA	NA	NA	NA	NA	*1.4*	*1.2*	NA	NA	NE	NE	NE	0.04
Mercury	mg/L	NA	NA	NA	0.0014	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	0.02
Total Cyanide (USEPA Method 9012)	mg/Kg	ND<0.59	ND<0.58	ND<0.54	ND<0.61	ND<0.51	ND<0.66	ND<0.66	ND<0.56	ND<0.57	ND<0.60	ND<0.56	200	NE	10,000	NE
PCB Aroclors (USEPA Method 8082)																
Aroclor 1260	µg/Kg	ND <16	ND <15	ND <14	ND <16	ND <14	ND <18	ND <18	ND <75	ND <76	ND <16	ND <75	10,000	10,000	10,000	10,000
TPH (USEPA Method 8100)																
C10-C28 Medium Petroleum Distillate	mg/Kg	ND <12	ND <12	ND <11	ND <12	ND <10	ND <13	ND <13	ND <11	ND <11	ND <12	ND <11	NE	NE	NE	NE
C16-C36 Heavy Petroleum Distillate	mg/Kg	22	ND <12	ND <11	180	ND <10	60	ND <13	130	120	170	360	NE	NE	NE	NE
Total Petroleum Hydrocarbons*	mg/Kg	22	ND <12	ND <11	180	ND <10	60	ND <13	130	120	170	360	500	2,500	2,500	500
VOC (USEPA Method 8260B)																
Acetone	µg/Kg	11	16	ND <11	ND <12	ND <8.4	150	160	ND <10	ND <10	ND <500	ND <17	7,800,000	NE	10,000,000	NE
Tetrachloroethene (PCE)	µg/Kg	25	51	38	8.2	26	7.1	ND <6.6	ND <5.2	ND <5.2	22	18	12,000	4,200	110,000	100
SVOC (USEPA Method 8270C)																
Anthracene	µg/Kg	ND <200	ND <190	ND <180	3,600	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	ND <1,900	35,000	NE	10,000,000	NE
Biphenyl	µg/Kg	ND <200	ND <190	ND <180	***ND <2,000***	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	***ND <1,900***	800	NE	10,000,000	NE
Benzo(a)anthracene	µg/Kg	ND <200	ND <190	ND <180	**9,500**	ND <170	ND <440	ND <220	560	740	ND <800	**4,100**	900	NE	7,800	NE
Benzo(a)pyrene	µg/Kg	ND <200	ND <190	ND <180	**9,100**	ND <170	***ND <440***	ND <220	**670**	**830**	***ND <800***	**4,900**	400	NE	800	240,000
Benzo(b)fluoranthene	µg/Kg	ND <200	ND <190	ND <180	**7,000**	ND <170	700	ND <220	810	**980**	ND <800	**4,200**	900	NE	7,800	NE
Benzo(ghi)perylene	µg/Kg	ND <200	ND <190	ND <180	**3,800**	ND <170	ND <440	ND <220	ND <370	580	ND <800	**2,100**	800	NE	10,000,000	NE
Benzo(k)fluoranthene	µg/Kg	ND <200	ND <190	ND <180	**8,600**	ND <170	460	ND <220	720	830	ND <800	**4,700**	900	NE	78,000	NE
Bis(2-chloroethyl)ether	µg/Kg	ND <200	ND <190	ND <180	***ND <2,000***	ND <170	ND <440	ND <220	ND <370	ND <380	***ND <800***	***ND <1,900***	600	NE	5,200	NE
Bis(2-chloroisopropyl)ether	µg/Kg	ND <390	ND <390	ND <360	ND <4,000	ND <340	ND <880	ND <440	ND <750	ND <760	ND <1,600	ND <3,700	9,100	NE	82,000	NE
Chrysene	µg/Kg	ND <200	ND <190	ND <180	**8,900**	ND <170	**870**	ND <220	**740**	**900**	***ND <800***	**3,800**	400	NE	780,000	NE
Dibenzo(ah)anthracene	µg/Kg	ND <200	ND <190	ND <180	***ND <2,000***	ND <170	***ND <440***	ND <220	ND <370	ND <380	***ND <800***	***ND <1,900***	400	NE	800	NE
3,3-Dichlorobenzidine	µg/Kg	ND <200	ND <190	ND <180	***ND <2,000***	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	***ND <1,900***	1,400	NE	13,000	NE
2,4-Dinitrotoluene	µg/Kg	ND <200	ND <190	ND <180	***ND <2,000***	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	***ND <1,900***	900	NE	8,400	NE
Fluoranthene	µg/Kg	ND <200	ND <190	ND <180	17,000	ND <170	530	ND <220	960	1,200	1,000	9,600	20,000	NE	10,000,000	NE
Fluorene	µg/Kg	ND <200	ND <190	ND <180	ND <2,000	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	ND <1,900	28,000	NE	10,000,000	NE
Hexachlorobenzne	µg/Kg	ND <200	ND <190	ND <180	***ND <2,000***	ND <170	***ND <440***	ND <220	ND <370	ND <380	***ND <800***	***ND <1,900***	400	NE	3,600	NE
Hexachlorobutadiene	µg/Kg	ND <200	ND <190	ND <180	ND <2,000	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	ND <1,900	8,200	NE	73,000	NE
Indeno (1,2,3-cd)pyrene	µg/Kg	ND <200	ND <190	ND <180	**4,800**	ND <170	ND <440	ND <220	ND <370	670	ND <800	**2,700**	900	NE	7,800	NE
2-Methylnaphthalene	µg/Kg	ND <200	ND <190	ND <180	ND <2,000	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	ND <1,900	123,000	NE	10,000,000	NE
Pentachlorophenol	µg/Kg	ND <200	ND <190	ND <180	ND <2,000	ND <170	ND <440	ND <220	ND <370	ND <380	ND <800	ND <1,900	5,300	NE	48,000	7,100
Phenanthrene	µg/Kg	ND <200	ND <190	ND <180	14,000	ND <170	840	ND <220	560	760	ND <800	7,900	40,000	NE	10,000,000	NE
Pyrene	µg/Kg	ND <200	ND <190	ND <180	**18,000**	ND <170	600	ND <220	1,500	2,200	2,000	11,000	13,000	NE	10,000,000	NE

NOTES:

RIDEM: Rhode Island Department of Environmental Management
USEPA: United States Environmental Protection Agency
SPLP: synthetic precipitate leaching procedure
PCBs: polychlorinated biphenyls
VOC: volatile organic compounds
TPH: total petroleum hydrocarbons
*: Total Petrolum Hydrocarbons is the sum of quantified hydrocarbon fractions
SVOC: semi-volatile organic compounds
MW: monitoring well

SB: soil boring
SS: surficial soil sample
mg/Kg: milligrams per kilogram
µg/Kg: micrograms per kilogram
mg/L: milligrams per liter
fbg: feet below grade
ND < X: compound not detected above laboratory reporting limit
NA: not analyzed
NE: criterion is not established

R-DEC: Residential Direct Exposure Criteria
I/C-DEC: Industrial/Commercial Direct Exposure Criteria
GB-LC: GB groundwater leachability criteria
GA-LC: GA groundwater leachability criteria
Only the last six digits of the sample number are listed.
Bold and shaded values exceed one or more regulatory criteria.
Bold, italized values indicate that reporting limits exceed one or more regulatory criteria
Italicized and underlined values indicate values that exceed reference criteria

Created by: PHG
Checked by: AMB

FUSS & O'NEILL

Table 6
Summary of Monitoring Well and Groundwater Elevations
Measured on September 30, 2011

Town Landing
Pawtucket, Rhode Island

Site Investigation Report/Targeted Brownfields Assessment
Prepared for RIDEM

April 2013

Location	Well Casing Elevation (feet) [1]	Depth to Groundwater [2]	Groundwater Elevation (feet) [1]
MW-01	71.44	6.08	65.36
MW-02	70.99	6.45	64.54
MW-03	72.51	5.47	67.04
MW-05	76.01	4.07	71.94
MW-06	100.00	25.30	74.70
MW-09	72.61	7.90	64.71

NOTES:

Created by: PHG

Checked by: AMB

MW: monitoring well

PVC: polyvinyl chloride

[1] Well elevations and associated groundwater elevations are based on an elevation survey conducted by Fuss & O'Neill on September 30, 2011. Elevations are based on an arbitrary 100.00 ft benchmark set at the top of the PVC riser pipe of monitoring well MW-6.

[2] Depth to groundwater was measured from the highest point of the PVC well casing, prior to purging and sampling.

FUSS & O'NEILL

Table 7
Summary of Groundwater Analytical Data
Collected September 30, 2011

Town Landing
Pawtucket, Rhode Island

Site Investigation Report/Targeted Brownfields Assessment
Prepared for RIDEM

April 2013

	Sample Location	MW-01	MW-02	MW-03	MW-05		MW-06*	MW-09	**RIDEM Regulatory Criteria**	**RIDEM Reference Criteria**
	Sample Number	0930-05	0930-04	0930-03	0930-01	0930-02	0930-07	0930-06		
	Sample Type	Primary	Primary	Primary	Primary	Duplicate	Primary	Primary		
	Screened Interval (fbg)	5-15	3-13	2-8	2-12		17-27	7-17	GB-GO	GA-GO
Field Measurements	UNITS									
pH	---	4.99	5.68	6.88	6.06		6.64	4.83	NE	NE
Specific Conductance	µS/cm	584	1,157	620	477		426	525	NE	NE
Temperature	C deg	16.14	16.14	15.92	16.68		14.78	16.46	NE	NE
Turbidity	ntu	4.90	103.0	0.90	2.79		NM	14.5	NE	NE
Dissolved Oxygen	mg/L	4.00	1.01	1.28	4.40		12.51	6.83	NE	NE
ORP	mv	-227.4	-260.5	-303.4	-190.9		-272.2	-191.3	NE	NE
Dissolved Metals (USEPA Method 6010/7470A)										
Barium	mg/L	NA	0.040	NA	NA	NA	NA	0.031	NE	2
Manganese	mg/L	NA	0.064	NA	NA	NA	NA	0.025	NE	NE
Nickel	mg/L	NA	0.038	NA	NA	NA	NA	0.0044	NE	0.1
Zinc	mg/L	NA	0.032	NA	NA	NA	NA	0.0071	NE	NE
Total Metals (USEPA Method 6010/7470A)										
Barium	mg/L	0.030	NA	0.048	0.047	0.047	0.050	NA	NE	2
Copper	mg/L	ND < 0.0020	NA	0.0059	0.0032	0.0034	0.0060	NA	NE	NE
Manganese	mg/L	0.016	NA	0.042	0.13	0.12	0.052	NA	NE	NE
Nickel	mg/L	0.0037	NA	0.0044	0.0036	ND < 0.0020	0.0034	NA	NE	0.1
Vanadium	mg/L	ND < 0.0020	NA	0.0025	ND < 0.0020	ND < 0.0020	ND < 0.0020	NA	NE	NE
Zinc	mg/L	0.0053	NA	0.0062	0.0057	0.0066	0.035	NA	NE	NE
Dissolved Cyanide (USEPA Method 9012)	mg/L	NA	ND < 0.010	NA	NA	NA	NA	ND < 0.010	NE	0.2
Total Cyanide (USEPA Method 9012)	mg/L	ND < 0.010	NA	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	NA	NE	0.2
SVOC (USEPA Method 8270C)	µg/L	ND < varies	ND < varies	ND < varies	ND < varies	ND < varies	ND < varies	ND < varies	NE	varies
VOC (USEPA Method 8260B)										
Chloroform	µg/L	ND < 1.0	ND < 1.0	ND < 1.0	ND < 1.0	ND < 1.0	ND < 1.0	1.2	NE	NE
Tetrachloroethene (PCE)	µg/L	ND < 1.0	ND < 1.0	ND < 1.0	2.3	2.1	ND < 1.0	ND < 1.0	150	5

NOTES:
RIDEM: Rhode Island Department of Environmental Management
USEPA: United States Environmental Protection Agency
MW: monitoring well
VOC: volatile organic compounds
SVOC: semi-volatile organic compounds
mg/L: milligrams per liter
µg/L: micrograms per liter
fbg: feet below grade
ORP: oxidation-reduction potential
µS/cm: microsiemens per centimeter

C deg: degrees Celsius
ntu: nephelometric turbidity units
mv: millivolts
ND < X: compound not detected above laboratory reporting limit
NE: not established
NA: not analyzed
GB-GO: GB Groundwater Objectives
GA-GO: GA Groundwater Objectives
Only the last six digits of the sample number are listed.

Created by: PHG
Checked by: AMB

*Depth to groundwater was too deep to use low flow sampling procedures. Instead, one field measurement was taken and a grab sample was collected using a dedicated disposable polyethylene bailer.

FUSS & O'NEILL

Table 8
Summary of Disposal Characterization Analytical Data
Collected May 30, 2012

Town Landing
Pawtucket, Rhode Island

Site Investigation Report/Targeted Brownfields Assessment
Prepared for RIDEM

April 2013

	Location	SB-101, SB-102, SB-103			SB-104, SB-105, SB-106		SB-101	SB-102	SB-104		SB-106	**RIRRC ACM[1] Acceptance Criteria**	**MassDEP Policy #COMM 97-001[2]**		**RCRA Characteristic Hazardous Waste Criteria (40 CFR §261.21- §261.24)**	
	Sample Depth (fbg)	0-2	2-4		0-2	2-4	0-2	2-4	2-4		0-2					
	Sample Number	0530-01	0530-02	0530-03	0530-04	0530-05	0530-17	0530-16	0530-07	0530-08	0530-11					
	Sample Type	Composite/ Primary	Composite/ Primary	Composite/ Primary	Composite/ Primary	Composite/ Primary	Primary	Primary	Primary	Duplicate	Primary		Lined Landfills	Unlined Landfills	Total[3]	TCLP
Total Metals (USEPA Method 6010/7471)	Units															
Arsenic	mg/Kg	4.9	**13**	**20**	**7.2**	5.4	----	----	----	----	----	7.0	40	40	100	----
Barium	mg/Kg	79	98	68	55	50	----	----	----	----	----	10,000	NE	NE	2,000	----
Cadmium	mg/Kg	0.82	2.4	1.2	0.96	0.99	----	----	----	----	----	1,000	80	30	20	----
Chromium	mg/Kg	21	21	21	11	15	----	----	----	----	----	10,000	1,000	1,000	100	----
Lead	mg/Kg	**120**	**170**	**180**	**100**	43	----	----	----	----	----	500	2,000	1,000	100	----
Mercury	mg/Kg	0.12	0.94	0.61	0.069	0.049	----	----	----	----	----	610	10	10	4	----
Selenium	mg/Kg	ND <0.28	ND <0.29	ND <0.29	ND <0.29	ND <0.28	----	----	----	----	----	10,000	NE	NE	20	----
Silver	mg/Kg	ND <0.11	ND <0.12	ND <0.11	ND <0.11	ND <0.11	----	----	----	----	----	10,000	NE	NE	100	----
TCLP Metals (USEPA Method 1311/6010)																
Lead	mg/L	0.24	0.76	0.27	0.051	----	----	----	----	----	----	NE	5.0	5.0	----	5.0
Total Cyanide (USEPA Method 9012)	mg/Kg	ND <0.55	1.4	0.75	ND <0.57	ND <0.55	----	----	----	----	----	10,000	non-reactive	non-reactive	non-reactive	----
Total Sulfide (USEPA Method 9030)	mg/Kg	ND <5.5	ND <5.7	ND <5.3	ND <5.5	ND <5.5	----	----	----	----	----	NE	non-reactive	non-reactive	non-reactive	----
Detected PCB Aroclors (USEPA Method 8082)																
Aroclor 1260	µg/Kg	170	98	150	180	59	----	----	----	----	----	NE	NE	NE	----	----
Total Detected PCB Aroclors	µg/Kg	170	98	150	180	59	----	----	----	----	----	10,000	2,000	2,000	----	----
TPH (USEPA Method 8100)																
C16-C36 Heavy Petroleum Distillate	mg/Kg	280	830	640	300	85	----	----	----	----	----	2,500	5,000	2,500	----	----
pH/Corrosivity (USEPA Method 9045)	pH units	8.1	8.2	8.2	9.1	9.9	----	----	----	----	----	NE	2 < pH < 12.5	2 < pH < 12.5	2 < pH < 12.5	----
Ignitability (USEPA Method 1010)	°F	>160	>160	>160	>160	>160	----	----	----	----	----	NE	>140	>140	>140	----
Specific Conductance (USEPA Method 9050)	micromhos/cm	50	60	70	83	96	----	----	----	----	----	NE	8,000	4,000	NE	----
Free Liquids Test (USEPA Method 9095)	Pass/Fail	Pass	Pass	Pass	Pass	Pass	----	----	----	----	----	Pass	Pass	Pass	NE	----
Detected VOC (USEPA Method 8260)																
Acetone	µg/Kg	----	----	----	----	----	ND <2,500	24	ND <9.0	ND <9.3	27	10,000,000	NE	NE	NE	----
2-Butanone (methyl ethyl ketone)	µg/Kg	----	----	----	----	----	ND <2,500	ND <18	ND <9.0	ND <9.3	15	10,000,000	NE	NE	4,000,000	----
Tetrachloroethene (PCE)	µg/Kg	----	----	----	----	----	ND <490	87	ND <4.5	ND <4.6	ND <6.6	110,000	NE	NE	14,000	----
Naphthalene	µg/Kg	----	----	----	----	----	960	ND <9.1	ND <4.5	ND <4.6	ND <6.6	10,000,000	NE	NE	NE	----
Total Detected VOC	µg/Kg	----	----	----	----	----	960	111	ND <18	ND <18	42	NE	10,000	4,000	NE	----
Detected SVOC (USEPA Method 8270)																
Acenaphthene	µg/Kg	ND <1,800	ND <9,700	14,000	ND <1,900	ND <370	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Anthracene	µg/Kg	ND <1,800	16,000	43,000	ND <1,900	ND <370	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Benzo(a)anthracene	µg/Kg	2,400	**31,000**	**68,000**	4,900	860	----	----	----	----	----	7,800	NE	NE	NE	NE
Benzo(a)pyrene	µg/Kg	**2,400**	**30,000**	**59,000**	**4,500**	**810**	----	----	----	----	----	800	NE	NE	NE	NE
Benzo(b)fluoranthene	µg/Kg	2,800	**34,000**	**71,000**	6,600	1,200	----	----	----	----	----	7,800	NE	NE	NE	NE
Benzo(ghi)perylene	µg/Kg	ND <1,800	9,900	15,000	ND <1,900	ND <370	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Benzo(k)fluoranthene	µg/Kg	ND <1,800	**14,000**	**29,000**	**2,200**	370	----	----	----	----	----	78,000	NE	NE	NE	NE
Chrysene	µg/Kg	2,400	30,000	60,000	5,000	1,000	----	----	----	----	----	780,000	NE	NE	NE	NE
Fluoranthene	µg/Kg	4,600	60,000	120,000	9,200	1,700	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Fluorene	µg/Kg	ND <1,800	ND <9,700	23,000	ND <1,900	ND <370	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Indeno (1,2,3-cd)pyrene	µg/Kg	ND <1,800	**14,000**	**23,000**	2,400	490	----	----	----	----	----	7,800	NE	NE	NE	NE
Phenanthrene	µg/Kg	2,900	71,000	150,000	8,900	1,800	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Pyrene	µg/Kg	4,600	58,000	120,000	9,400	1,600	----	----	----	----	----	10,000,000	NE	NE	NE	NE
Total Detected SVOC	µg/Kg	22,100	**367,900**	**795,000**	53,100	9,830	----	----	----	----	----	NE	100,000	100,000	NE	NE

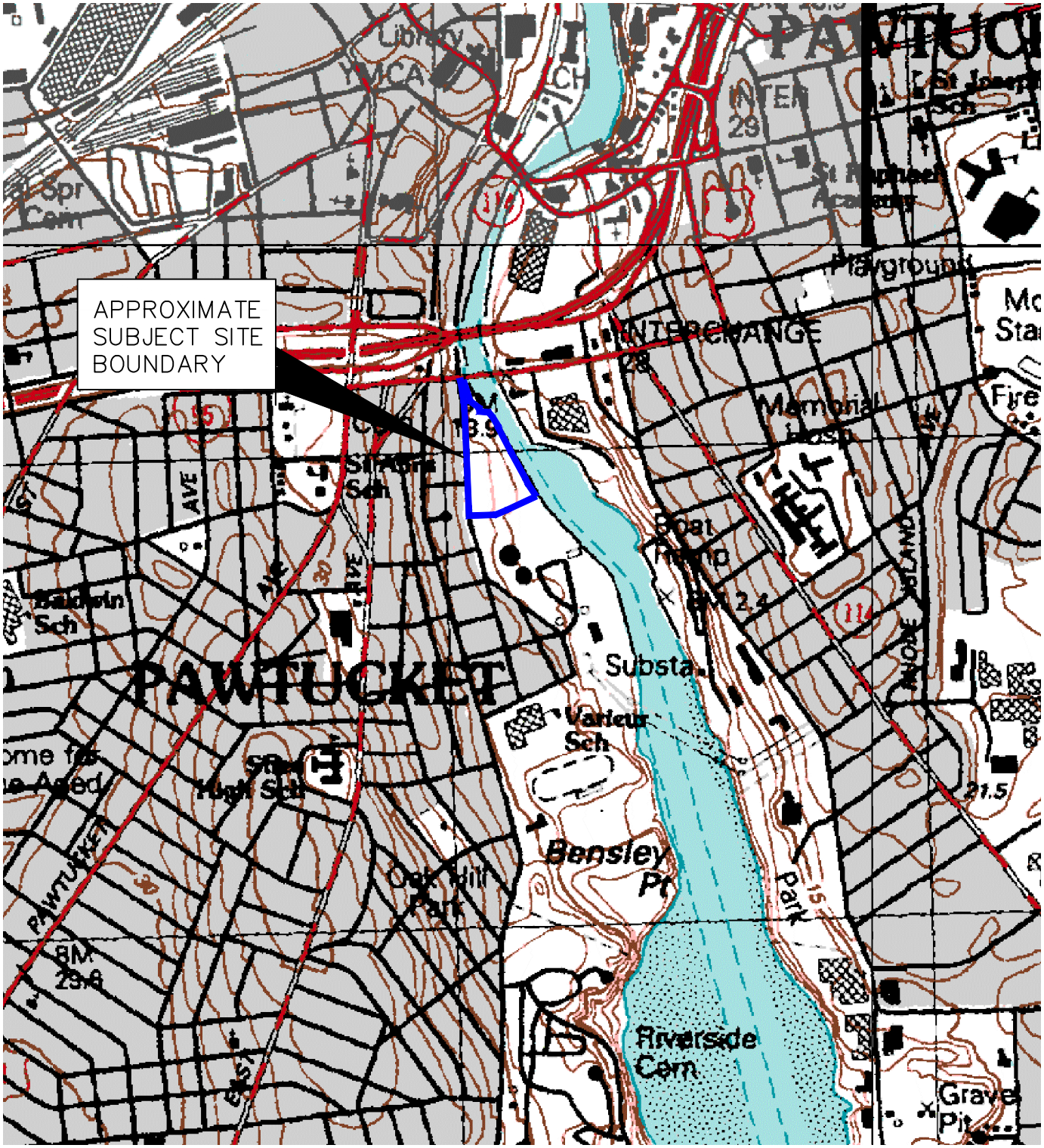
NOTES:
RIDEM: Rhode Island Department of Environmental Management
MassDEP: Massachusetts Department of Environmental Protection
USEPA: United States Environmental Protection Agency
RCRA: Resource Conservation and Recovery Act
TCLP: toxicity characteristic leaching procedure
PCB: polychlorinated biphenyls
VOC: volatile organic compounds
TPH: total petroleum hydrocarbons

SVOC: semi-volatile organic compounds
SB: soil boring
mg/Kg: milligrams per kilogram
µg/Kg: micrograms per kilogram
mg/L: milligrams per liter
fbg: feet below grade
ND < X: compound not detected above laboratory reporting limit
----: not analyzed or not applicable

NE: criterion is not established
Only the last six digits of the sample number are listed.
[1] Alternative Cover Material Policy, Rhode Island Resource Recovery Corporation (RIRRC), amended June 2010
[2] MassDEP Policy #COMM-97-001: Reuse & Disposal of Contaminated Soil at Massachusetts Landfills
[3] "Total" criteria were calculated by multiplying the associated TCLP value by a factor of 20.
Bold values indicate concentration exceeds TCLP value listed in 40 CFR §261.24 by a factor of 20 or greater.
Bold and shaded values exceed one or more of the listed criteria.

Created by: SAH
Checked by: TJC

Figures



MAP REFERENCE

THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5X15 MINUTE USGS TOPOGRAPHIC QUADRANGLES PROVIDED BY RIGIS:
PROVIDENCE RI–MA, 1987
ATTLEBORO MA–RI, 1987

File Path: J:\DWG\P20101382\A10\Environmental\Plan\SIR\20101382A10-LOC001-SIR.dwg, Layout: 08.5x11-P_RI71-SM-COLOR, Plotted: Mon, Mar 25, 2013 - 3:23 PM User: shubbs
Plotter: DWG TO PDF.PC3 CTB File: FO 2008 COLOR (HALF).CTB
MS VIEW:
LAYER STATE:

SCALE:
HORZ.: 1" = 1000'
VERT.:
DATUM:
HORZ.:
VERT.:
0 500 1000
GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

RIDEM

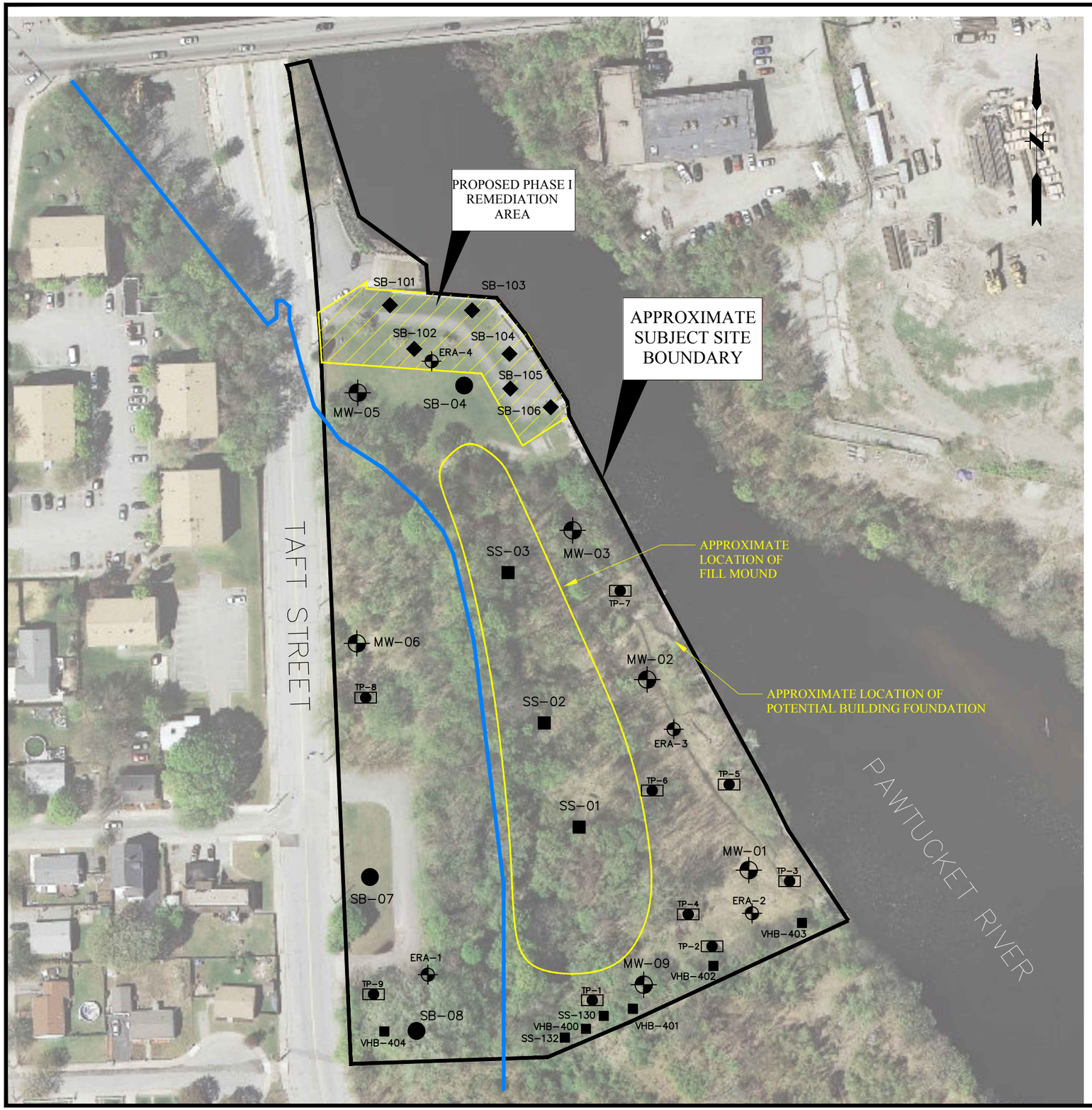
SITE LOCATION MAP

TOWN LANDING

TAFT STREET PAWTUCKET, RHODE ISLAND

PROJ. No.: 20101382.A10
DATE: APRIL 2013

FIGURE 1



LEGEND

100-YEAR FLOOD PLAIN BOUNDARY

2011-2012 TARGETED BROWNFIELDS ASSESSMENT:

- MW-01 — MONITORING WELL
- SB-02 — SOIL BORING
- SS-01 — SURFACE SOIL SAMPLE
- SB-101 — PRE-DISPOSAL SOIL CHARACTERIZATION SAMPLE

PRE-2011 INVESTIGATIONS:

- TP-1 — ERA 1988 TEST PIT LOCATION
- ERA-1 — ERA 1988 MONITORING WELL (COULD NOT BE LOCATED)
- VHB-400 — VHB 2006 SURFACE SOIL SAMPLE
- SS-130 — GZA 2010 SURFACE SOIL SAMPLE

MAP REFERENCES AND NOTES

AERIAL PHOTOGRAPHY ACQUIRED APRIL-MAY 2011, © 2011 RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM (RIGIS).

SITE FEATURES AND SAMPLING LOCATIONS ARE APPROXIMATE.

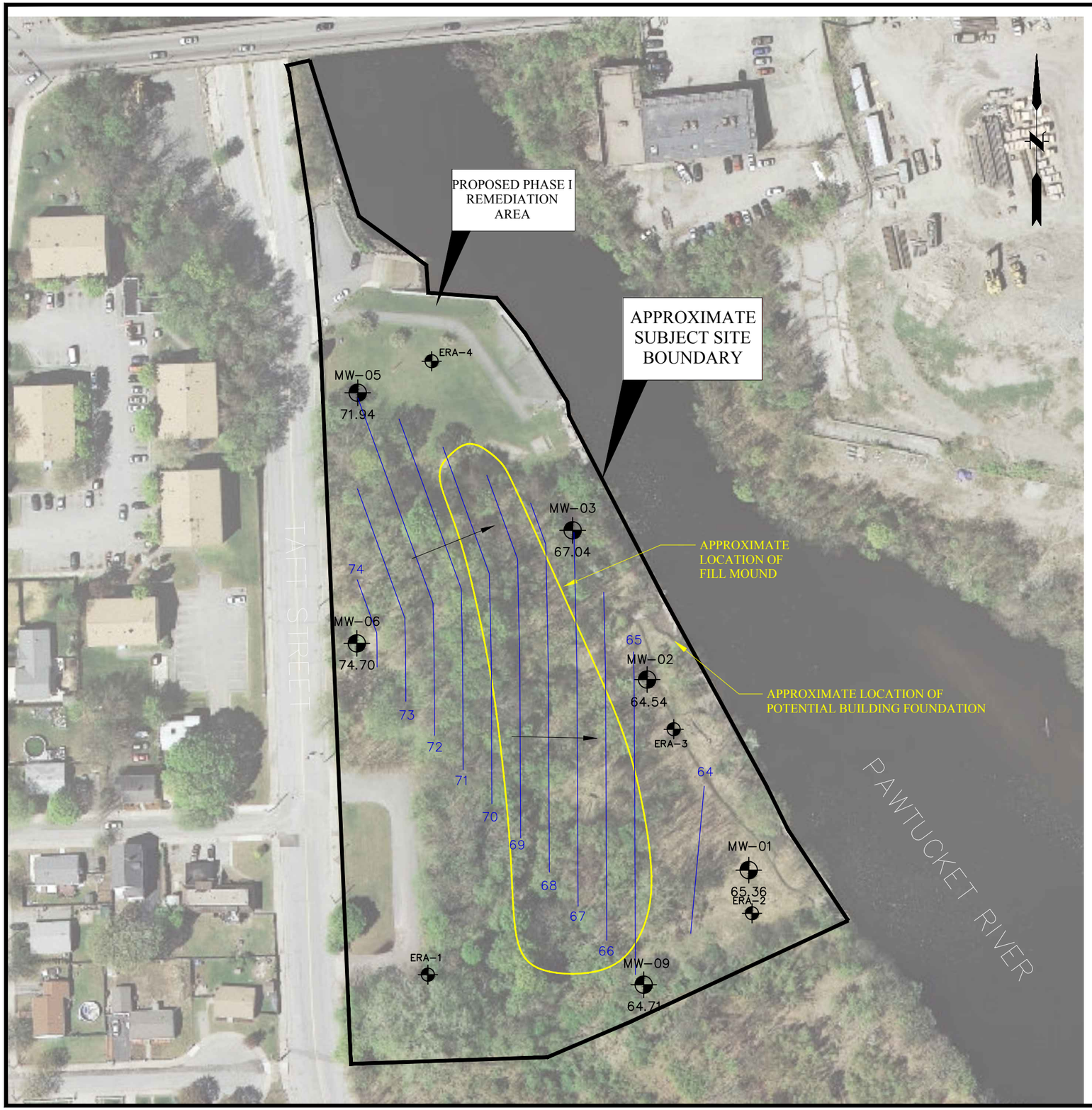
TOTAL SITE AREA: 5.35 ACRES (25,894 SQUARE YARDS)

TOTAL SITE AREA WITHIN THE 100-YEAR FLOOD PLAIN: APPROX. 3.70 ACRES

SCALE:
HORZ.: 1" = 100'
VERT.:
DATUM:
HORZ.:
VERT.:
0 50 100
GRAPHIC SCALE

PROJ. No.: 20101382.A10
DATE: APRIL 2013

File Path: C:\Temp\AcPublish_14442\20101382A10-STP001-SIR.dwg, Layout: FIGURE 2, Plotted: Mon, Mar 25, 2013 - 3:51 PM User: shubbs
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO 2008 COLOR (HALF).CTB



LEGEND

MW-01
65.36 — MONITORING WELL AND GROUNDWATER ELEVATION (FEET) MEASURED SEPTEMBER 30, 2011

1.00-FT GROUNDWATER EQUIPOTENTIAL CONTOUR

INFERRED DIRECTION OF GROUNDWATER FLOW

ERA-1

MAP REFERENCES AND NOTES

AERIAL PHOTOGRAPHY ACQUIRED APRIL-MAY 2011, © 2011 RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM (RIGIS).

SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

GROUNDWATER ELEVATIONS ARE RELATIVE TO AN ARBITRARY 100.00-FT BENCHMARK AT THE TOP OF THE PVC CASING OF MW-06. ELEVATIONS ARE BASED ON A SURVEY CONDUCTED BY FUSS & O'NEILL ON SEPTEMBER 30, 2011.

SCALE:
HORZ.: 1" = 100'
VERT.:
DATUM:
HORZ.:
VERT.:
0 50 100
GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

RIDEM
GROUNDWATER FLOW MAP
SITE INVESTIGATION REPORT / TARGETED BROWNFIELDS ASSESSMENT
TOWN LANDING
TAFT STREET
PAWTUCKET, RHODE ISLAND

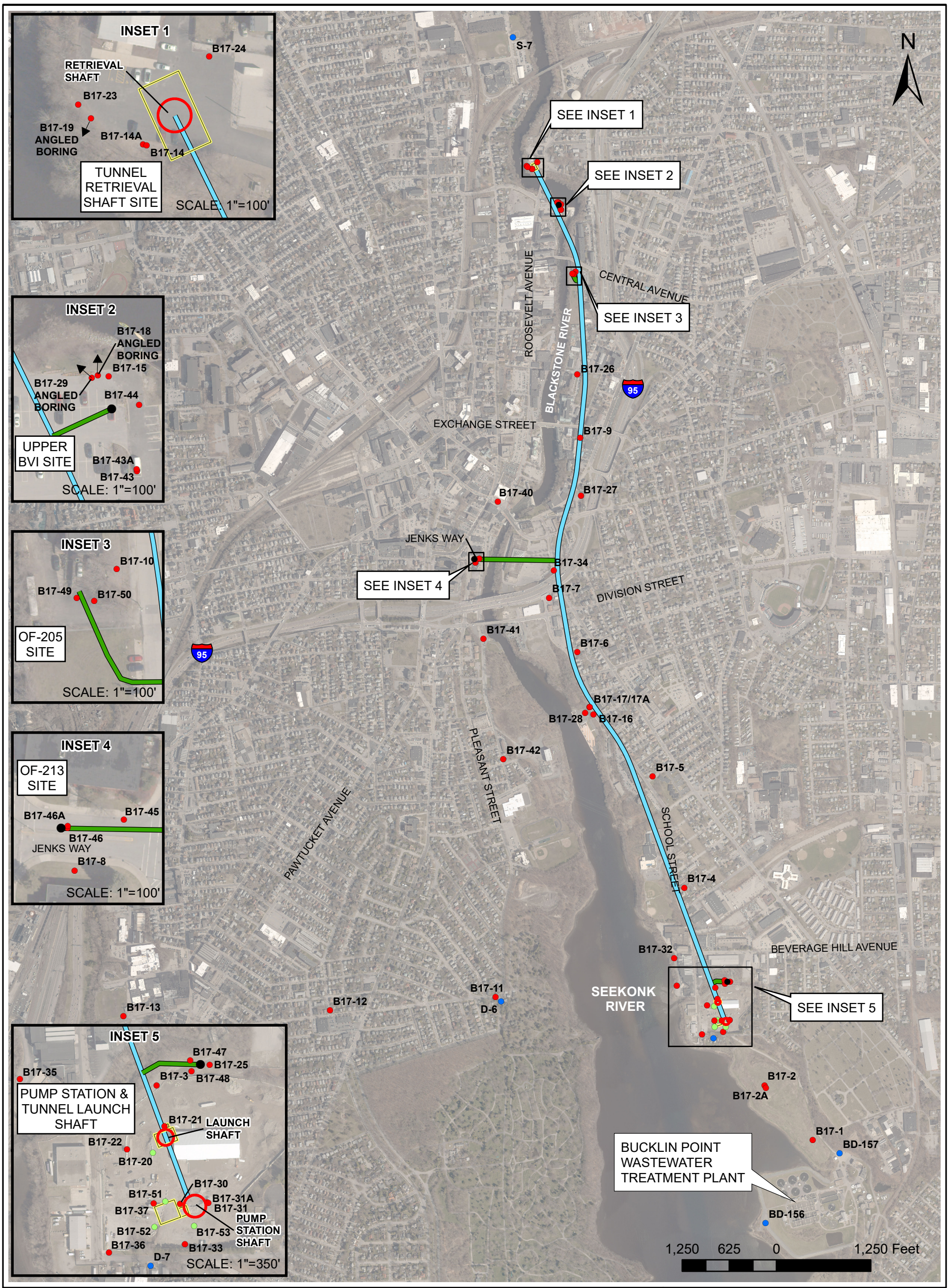
PROJ. No.: 20101382.A10
DATE: APRIL 2013

FIGURE 3

File Path: C:\Temp\AcPublish_1444\20101382A10-GW001-SIR.dwg, Layout: FIGURE 3, Plotted: Mon, Mar 25, 2013 - 3:50 PM User: shubbs
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO 2008 COLOR (HALF).CTB

APPENDIX C

PROGRAM BORINGS



REVISED JUNE 10, 2019

Legend

- Existing Boring (completed or ongoing as of 6/10/19)
- Proposed Boring (approximate location)
- Non-Project Borings Along the Pawtucket Alignment
- Proposed Drop Shaft (approximate location)
- Proposed Pawtucket Tunnel (approximate alignment)
- Proposed Adit Tunnel (approximate location)

TITLE:

BORING LOCATION PLAN

PHASE III CSO CONTROL FACILITIES PROGRAM

REFERENCE(S): DATE: JUNE 2019

Coordinate System: NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Units: Foot US

The Narragansett Bay Commission

Stantec

PARE CORPORATION

FIGURE:

Phase III CSO Program
Summary Data Table: B17-39

Laboratory Sample Designation	RIDEM R DEC	RIDEM I/C DEC	GA Leach	GB Leach	RIRRC ACM	19H0058-01	19H0058-02	19H0058-03	19H0058-04	19H0058-05	19H0058-06
Sample Designation						B17-39	B17-39	B17-39	B17-39	B17-39	B17-39
Sample Date						08/02/2019	08/02/2019	08/02/2019	08/02/2019	08/02/2019	08/02/2019
Sample Depth						0-2 ft	2-4 ft	4-6 ft	6-8 ft	8-10 ft	10-14 ft
PID**						0	0	0.1	0	4.8	1.15
VOCs - Low - mg/kg											
Acetone	7800	10000	NS	NS	NS	**0.0620**	< 0.0341	< 0.0483	< 0.0394	**0.0452**	**0.0523**
Tetrachloroethene	12	110	0.1	NS	NS	< 0.0036	< 0.0034	< 0.0048	< 0.0039	**0.0066**	**0.0253**
SVOCs - mg/kg											
Benzo(a)anthracene	0.9	7.8	NS	NS	100	**1.13**	< 0.336	**0.482**	**0.460**	< 0.359	< 0.4
Benzo(a)pyrene	0.4	0.8	240	NS	4	**0.934**	**0.253**	**0.474**	**0.439**	**0.236**	< 0.201
Benzo(b)fluoranthene	0.9	7.8	NS	NS	100	**0.924**	< 0.336	**0.435**	< 0.373	< 0.359	< 0.4
Benzo(g,h,i)perylene	0.8	10000	NS	NS	100	**0.528**	< 0.336	< 0.332	< 0.373	< 0.359	< 0.4
Benzo(k)fluoranthene	0.9	78	NS	NS	100	**0.761**	< 0.336	**0.392**	**0.429**	< 0.359	< 0.4
Chrysene	0.4	780	NS	NS	100	**1.05**	**0.333**	**0.459**	**0.510**	**0.303**	< 0.201
Dibenzo(a,h)Anthracene	0.4	0.8	NS	NS	100	**0.203**	< 0.169	< 0.166	< 0.187	< 0.18	< 0.201
Fluoranthene	20	10000	NS	NS	100	**2.13**	**0.781**	**0.963**	**0.948**	**0.656**	< 0.4
Indeno(1,2,3-cd)Pyrene	0.9	7.8	NS	NS	100	**0.501**	< 0.336	< 0.332	< 0.373	< 0.359	< 0.4
Phenanthrene	40	10000	NS	NS	100	**0.983**	**0.564**	**0.480**	**0.567**	**0.421**	< 0.4
Pyrene	13	10000	NS	NS	100	**1.71**	**0.635**	**0.853**	**0.756**	**0.495**	< 0.4
TPH - ETPH - mg/kg											
Total Petroleum Hydrocarbons	500	2500	500	2500	2500	**248**	**115**	**51.3**	- **80.9**	- **58.5**	< 42.3
Total Metals - mg/kg											
Arsenic	7	7	NS	NS	19	**5.85**	< 2.27	**2.63**	< 2.65	**3.97**	< 2.66
Barium	5500	10000	NS	NS	10000	**705**	**16.8**	**31.0**	- **82.6**	**54.9**	**16.7**
Cadmium	39	1000	NS	NS	1000	**21.1**	< 0.45	**0.69**	- **0.58**	< 0.52	< 0.53
Chromium	1400	10000	NS	NS	10000	**64.3**	**8.64**	**10.3**	- **14.1**	**13.4**	**11.9**
Lead	150	500	NS	NS	2000	**2340**	**54.2**	**108**	- **148**	**234**	**21.6**
Mercury	23	610	NS	NS	610	**1.34** D	**0.084**	**0.595** D	- **0.345**	**0.434**	**0.030**
Selenium	390	10000	NS	NS	10000	**1.71**	< 4.55	< 0.45	- **0.64**	**0.82**	< 5.32
Silver	200	10000	NS	NS	10000	< 0.52	< 0.45	**1.44**	< 0.53	< 0.52	< 0.53
TCLP Metals - mg/kg											
Cadmium	5	5	1.1	NS	NS	**0.458**	NT	NT	NT	NT	NT
Lead	5	5	0.04	NS	NS	**6.81**	NT	< 0.05	**0.524**	**0.081**	NT
PCBs - mg/kg											
Aroclor 1260	10	10	10	10	10	**0.08**	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06

Qualifier	Description
All Entries	**Data is summarized above for convenience purposes only. Refer to complete laboratory analytical reports for actual data.**
*	Only those compounds which were detected in at least one sample were summarized above. See laboratory report for a complete list of target analytes.
**	Recorded in parts per million (volume basis), maximum PID value recorded at depth.
<	Less than.
NS	No standard established.
NT	Not tested.
D	Diluted.
ND	Not detected.
Bold	Reported value is detected above laboratory Method Reporting Limit (MRL).
Yellow	Reported above RIDEM RDEC but below I/C DEC.
Orange	Reported above RIDEM I/C DEC.

Phase III CSO Program
Summary Data Table: B17-40

Laboratory Sample Designation	RIDEM	RIDEM	GA	GB	RIRRC	1805331-06	1805331-07	1805331-08	1805331-09	1805331-10
Sample Designation	R DEC	I/C DEC	Leach	Leach	ACM	B17-40	B17-40	B17-40	B17-40	B17-40
Sample Date						05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
Sample Depth						0.5-2.5ft	2.5-4.5ft	4.5-6ft	6-8ft	8-10ft
PID**						0	0	0	0	0
VOCs - Low - mg/kg						ND	ND	ND	ND	ND
SVOCs - mg/kg										
Benzo(a)anthracene	0.9	7.8	NS	NS	100	< 0.366	**0.488**	< 0.35	< 0.372	NT
Benzo(a)pyrene	0.4	0.8	240	NS	4	< 0.184	**0.439**	< 0.176	< 0.187	NT
Benzo(g,h,i)perylene	0.8	10000	NS	NS	100	< 0.366	**0.377**	< 0.35	< 0.372	NT
Benzo(k)fluoranthene	0.9	78	NS	NS	100	< 0.366	**0.380**	< 0.35	< 0.372	NT
bis(2-Ethylhexyl)phthalate	46	410	NS	NS	100	< 0.366	< 0.363	**0.355**	**0.545**	NT
Chrysene	0.4	780	NS	NS	100	< 0.184	**0.432**	< 0.176	< 0.187	NT
Di-n-butylphthalate	NS	NS	NS	NS	100	< 0.366	< 0.363	< 0.35	**0.377**	NT
Fluoranthene	20	10000	NS	NS	100	< 0.366	**0.727**	< 0.35	< 0.372	NT
Pyrene	13	10000	NS	NS	100	< 0.366	**0.804**	< 0.35	< 0.372	NT
TPH - ETPH - mg/kg										
Total Petroleum Hydrocarbons	500	2500	500	2500	2500	**94.6**	**93.0**	< 40.9	< 40.9	NT
Total Metals - mg/kg										
Arsenic	7	7	NS	NS	19	**3.50**	**6.51**	**3.43**	**5.44**	NT
Barium	5500	10000	NS	NS	10000	**21.1**	**20.7**	**17.1**	**20.8**	NT
Cadmium	39	1000	NS	NS	1000	< 0.42	< 0.47	< 0.47	< 0.46	NT
Chromium	1400	10000	NS	NS	10000	**5.37**	**16.3**	**6.92**	**15.3**	NT
Lead	150	500	NS	NS	2000	**7.53**	**31.4**	**25.1**	**23.7**	NT
Mercury	23	610	NS	NS	610	**0.053**	**0.103**	**0.034**	< 0.029	NT
Selenium	390	10000	NS	NS	10000	< 0.85	< 0.93	< 0.94	< 0.91	NT
Silver	200	10000	NS	NS	10000	< 0.42	< 0.47	< 0.47	< 0.46	NT
PCBs - mg/kg	10	10	10	10	10	ND	ND	ND	ND	NT

Qualifier	Description
All Entries	**Data is summarized above for convenience purposes only. Refer to complete laboratory analytical reports for actual data.**
*	Only those compounds which were detected in at least one sample were summarized above. See laboratory report for a complete list of target analytes.
**	Recorded in parts per million (volume basis), maximum PID value recorded at depth.
<	Less than.
NS	No standard established.
D	Diluted.
ND	Not detected.
Bold	Reported value is detected above laboratory Method Reporting Limit (MRL).
Yellow	Reported above RIDEM RDEC but below I/C DEC.
Orange	Reported above RIDEM I/C DEC.

Phase III CSO Program
Summary Data Table: B17-45

Laboratory Sample Designation	RIDEM R DEC	RIDEM I/C DEC	GA Leach	GB Leach	RIRRC ACM	1904057-01	1904057-02	1904057-03	1904057-04	1904057-05
Sample Designation						B17-45	B17-45	B17-45	B17-45	B17-45
Sample Date						04/02/2019	04/02/2019	04/02/2019	04/02/2019	04/02/2019
Sample Depth						0.75-2 FT	2-4 FT	4-8 FT	8-12 FT	12-14 FT
PID**						0	0	0.3	0	0
VOCs - Low - mg/kg						ND	ND	ND	ND	ND
SVOCs - mg/kg										
Acenaphthylene	23	10000	NS	NS	100	< 0.368	< 0.74 D	**2.30**	< 0.412	< 0.439
Anthracene	35	10000	NS	NS	100	< 0.368	< 0.74 D	**2.71**	< 0.412	< 0.439
Benzo(a)anthracene	0.9	7.8	NS	NS	100	**0.419**	< 0.74 D	**9.48**	**1.21**	**0.958**
Benzo(a)pyrene	0.4	0.8	240	NS	4	**0.359**	< 0.371 D	**7.98**	**1.18**	**0.944**
Benzo(b)fluoranthene	0.9	7.8	NS	NS	100	< 0.368	< 0.74 D	**8.51**	**0.941**	**0.761**
Benzo(g,h,i)perylene	0.8	10000	NS	NS	100	< 0.368	< 0.74 D	**5.13**	**0.702**	**0.518**
Benzo(k)fluoranthene	0.9	78	NS	NS	100	< 0.368	< 0.74 D	**3.99**	**0.868**	**0.606**
Chrysene	0.4	780	NS	NS	100	**0.323**	< 0.371 D	**7.56**	**1.01**	**0.733**
Dibenzo(a,h)Anthracene	0.4	0.8	NS	NS	100	< 0.185	< 0.371 D	**2.70**	**0.327**	**0.246**
Dibenzofuran	NS	NS	NS	NS	100	< 0.368	< 0.74 D	**0.394**	< 0.412	< 0.439
Fluoranthene	20	10000	NS	NS	100	**0.825**	< 0.74 D	**21.4** D	**2.06**	**1.47**
Indeno(1,2,3-cd)Pyrene	0.9	7.8	NS	NS	100	< 0.368	< 0.74 D	**4.75**	**0.644**	**0.461**
Naphthalene	54	10000	0.8	NS	100	< 0.368	< 0.74 D	**0.506**	< 0.412	< 0.439
Phenanthrene	40	10000	NS	NS	100	< 0.368	< 0.74 D	**8.28**	**0.552**	< 0.439
Pyrene	13	10000	NS	NS	100	**0.695**	< 0.74 D	**18.1** D	**2.09**	**1.71**
Pyridine	NS	NS	NS	NS	100	< 1.85	< 3.71 D	< 1.93	< 2.07	< 2.2
TPH - ETPH - mg/kg										
Total Petroleum Hydrocarbons	500	2500	500	2500	2500	**63.9**	**252** D	**462** D	**67.2**	**138**
Total Metals - mg/kg										
Arsenic	7	7	NS	NS	19	**2.45**	**2.02**	**3.33**	**3.60**	**4.07**
Barium	5500	10000	NS	NS	10000	**20.0**	**20.7**	**34.8**	**142**	**61.4**
Cadmium	39	1000	NS	NS	1000	< 0.47	< 0.31	< 0.23	< 0.23	< 0.24
Chromium	1400	10000	NS	NS	10000	**7.72**	**8.44**	**9.16**	**10.4**	**17.7**
Lead	150	500	NS	NS	2000	**29.6**	**19.5**	**60.2**	**678**	**898**
Mercury	23	610	NS	NS	610	< 0.036	< 0.014	**0.315**	**0.746** D	**0.255**
Selenium	390	10000	NS	NS	10000	< 4.73	< 3.09	< 2.25	< 2.32	< 2.35
Silver	200	10000	NS	NS	10000	< 0.47	< 0.31	< 0.23	< 0.23	< 0.24
TCLP Metals - mg/kg										
Lead	5	5	0.04	NS	NS	NT	NT	NT	**0.926**	**0.233**
PCBs - mg/kg	10	10	10	10	10	ND	ND	ND	ND	ND

Qualifier	Description
All Entries	**Data is summarized above for convenience purposes only. Refer to complete laboratory analytical reports for actual data.**
*	Only those compounds which were detected in at least one sample were summarized above. See laboratory report for a complete list of target analytes.
**	Recorded in parts per million (volume basis), maximum PID value recorded at depth.
<	Less than.
NS	No standard established.
NT	Not tested.
D	Diluted.
ND	Not detected.
Bold	Reported value is detected above laboratory Method Reporting Limit (MRL).
Yellow	Reported above RIDEM RDEC but below I/C DEC.
Orange	Reported above RIDEM I/C DEC.

Phase III CSO Program
Summary Data Table: B17-46

Laboratory Sample Designation	RIDEM R DEC	RIDEM I/C DEC	GA Leach	GB Leach	RIRRC ACM	1904132-01	1904132-02	1904132-03	1904132-04	1904132-05
Sample Designation						B17-46	B17-46	B17-46	B17-46	B17-46
Sample Date						04/03/2019	04/03/2019	04/03/2019	04/03/2019	04/03/2019
Sample Depth						1-4 FT	4-6 FT	6-8 FT	8-10 FT	10-11.5 FT
PID**						0.1	0	0	0	0
VOCs - Low - mg/kg										
Naphthalene	54	10000	0.8	NS	100	< 0.0145	< 0.0154	**0.0251**	< 0.0167	**0.0452**
Tetrachloroethene	12	110	0.1	4.2	NS	< 0.0145	**0.0157**	< 0.0139	**0.0240**	**0.0154**
SVOCs - mg/kg										
Acenaphthene	43	10000	NS	NS	100	< 0.383	< 0.411	**0.402**	< 0.39	< 0.406
Acenaphthylene	23	10000	NS	NS	100	< 0.383	< 0.411	**2.06**	< 0.39	**0.410**
Anthracene	35	10000	NS	NS	100	< 0.383	< 0.411	**6.14**	**0.539**	**0.999**
Benzo(a)anthracene	0.9	7.8	NS	NS	100	< 0.383	**0.808**	**9.38** D	**1.05**	**2.00**
Benzo(a)pyrene	0.4	0.8	240	NS	4	< 0.192	**0.663**	**8.58**	**0.904**	**1.64**
Benzo(b)fluoranthene	0.9	7.8	NS	NS	100	< 0.383	**0.552**	**7.30**	**0.776**	**1.32**
Benzo(g,h,i)perylene	0.8	10000	NS	NS	100	< 0.383	< 0.411	**4.81**	**0.577**	**0.872**
Benzo(k)fluoranthene	0.9	78	NS	NS	100	< 0.383	**0.532**	**5.77**	**0.622**	**1.21**
Carbazole	NS	NS	NS	NS	100	< 0.383	< 0.411	**2.87**	< 0.39	**0.441**
Chrysene	0.4	780	NS	NS	100	< 0.192	**0.637**	**7.83**	**0.913**	**1.70**
Dibenzo(a,h)Anthracene	0.4	0.8	NS	NS	100	< 0.192	< 0.206	**2.29**	**0.262**	**0.446**
Dibenzofuran	NS	NS	NS	NS	100	< 0.383	< 0.411	**0.844**	< 0.39	**0.503**
Fluoranthene	20	10000	NS	NS	100	< 0.383	**1.83**	**24.0** D	**2.69**	**4.42**
Fluorene	28	10000	NS	NS	100	< 0.383	< 0.411	**1.61**	< 0.39	**0.552**
Indeno(1,2,3-cd)Pyrene	0.9	7.8	NS	NS	100	< 0.383	< 0.411	**4.52**	**0.495**	**0.847**
Naphthalene	54	10000	0.8	NS	100	< 0.383	< 0.411	**0.503**	< 0.39	**0.513**
Phenanthrene	40	10000	NS	NS	100	< 0.383	**1.11**	**23.0** D	**2.51**	**4.47**
Pyrene	13	10000	NS	NS	100	< 0.383	**1.46**	**21.6** D	**2.16**	**3.33**
TPH - ETPH - mg/kg										
Total Petroleum Hydrocarbons	500	2500	500	2500	2500	**44.6**	**60.6**	**225**	< 46	< 42.4
Total Metals - mg/kg										
Arsenic	7	7	NS	NS	19	< 2.66	**3.43**	**4.22**	**3.80**	**2.73**
Barium	5500	10000	NS	NS	10000	**27.0**	**38.4**	**39.3**	**39.0**	**29.3**
Cadmium	39	1000	NS	NS	1000	< 0.53	< 0.43	< 0.23	< 0.24	< 0.21
Chromium	1400	10000	NS	NS	10000	**6.52**	**9.86**	**8.64**	**8.18**	**13.0**
Lead	150	500	NS	NS	2000	**28.0**	**102**	**137**	**98.6**	**109**
Mercury	23	610	NS	NS	610	**0.065**	**0.827** D	**0.207**	**0.383**	**0.168**
Selenium	390	10000	NS	NS	10000	< 5.31	< 4.3	< 2.29	< 2.35	< 2.12
Silver	200	10000	NS	NS	10000	< 0.53	< 0.43	< 0.23	< 0.24	< 0.21
TCLP Metals - mg/kg										
Lead	5	5	0.04	NS	NS	NT	**0.108**	**0.465**	NT	NT
PCBs - mg/kg	10	10	10	10	10	ND	ND	ND	ND	ND

Qualifier	Description
All Entries	**Data is summarized above for convenience purposes only. Refer to complete laboratory analytical reports for actual data.**
*	Only those compounds which were detected in at least one sample were summarized above. See laboratory report for a complete list of target analytes.
**	Recorded in parts per million (volume basis), maximum PID value recorded at depth.
<	Less than.
NS	No standard established.
NT	Not tested.
D	Diluted.
ND	Not detected.
Bold	Reported value is detected above laboratory Method Reporting Limit (MRL).
Yellow	Reported above RIDEM RDEC but below I/C DEC.
Orange	Reported above RIDEM I/C DEC.

Phase III CSO Program
Summary Data Table: Consolidation Conduit Soil Data

				B17-40					B17-41				B17-42			
Laboratory Sample Designation		RES DEC	IC DEC	1805331-06	1805331-07	1805331-08	1805331-09	1805331-10	1805125-01	1805125-02	1805125-03	1805125-04	1805146-01	1805146-02	1805146-03	1805146-04
Sample Designation				B17-40 S1	B17-40 S2	B17-40 S3	B17-40 S4	B17-40 S5	B-17-41 S1	B-17-41 S3	B-17-41 S4	B-17-41 S5	B-17-42 S1	B-17-42 S2	B-17-42 S3	B-17-42 S4
Sample Date				05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/03/2018	05/03/2018	05/03/2018	05/03/2018	05/04/2018	05/04/2018	05/04/2018	05/04/2018
Sample Depth				0.5-2.5ft	2.5-4.5ft	4.5-6ft	6-8ft	8-10ft	0.75-2.75ft	4-6ft	6-8ft	8-10ft	0.67-2.67ft	2.67-4ft	4-6ft	6-8ft
Soil Type																
Group Designation																
PID				0	0	0	0	0	0	0	0	0	0	0	0	0
VOCs																
1,2-Dibromo-3-Chloropropane	mg/k	0.5	4.1	< 0.0031	< 0.0028	< 0.003	< 0.0032	< 0.0032	< **0.661**	< **0.681**	< **0.657**	< **0.668**	< 0.462	< 0.466	< **0.522**	< 0.486
1,2-Dibromoethane	mg/k	0.01	0.07	< 0.0031	< 0.0028	< 0.003	< 0.0032	< 0.0032	< **0.132**	< **0.136**	< **0.131**	< **0.134**	< **0.0924**	< **0.0932**	< **0.104**	< **0.0972**
Vinyl Chloride	mg/k	0.02	3	< 0.0063	< 0.0055	< 0.006	< 0.0064	< 0.0064	< **0.132**	< **0.136**	< **0.131**	< **0.134**	< **0.0924**	< **0.0932**	< **0.104**	< **0.0972**
SVOCs																
Benzo(a)pyrene	mg/k	0.4	0.8	< 0.184	< **0.439**	< 0.176	< 0.187	---	**0.499**	< 0.196	< 0.18	< 0.2	< 0.176	< 0.182	< 0.178	< 0.187
Chrysene	mg/k	0.4	780	< 0.184	< **0.432**	< 0.176	< 0.187	---	0.332	< 0.196	< 0.18	< 0.2	< 0.176	< 0.182	< 0.178	< 0.187
TPH - ETPH																
Total Petroleum Hydrocarbons	mg/k	500	2500	94.6	< 93.0	< 40.9	< 40.9	---	45.8	< 42	< 41.4	< 41.7	< 38.3	< 39.1	< 38.3	< 42
Total Metals																
Arsenic	mg/k	7	7	3.50	< 6.51	3.43	5.44	---	4.36	3.72	6.32	2.68	4.64	**10.1**	3.13	**11.4**
Barium	mg/k	5500	10000	21.1	< 20.7	17.1	20.8	---	19.1	26.0	12.8	15.4	8.73	10.6	10.7	22.1
Cadmium	mg/k	39	1000	< 0.42	< 0.47	< 0.47	< 0.46	---	< 0.48	< 0.49	< 0.44	< 0.51	< 0.49	< 0.47	< 0.42	< 0.47
Chromium	mg/k	1400	10000	5.37	16.3	6.92	15.3	---	9.39	7.68	6.99	9.55	6.61	8.38	6.98	10.0
Lead	mg/k	150	500	7.53	31.4	25.1	23.7	---	19.9	12.5	16.1	8.28	5.12	< 4.67	< 4.16	< 9.77
Mercury	mg/k	23	610	0.053	0.103	0.034	< 0.029	---	0.030	< 0.024	< 0.031	< 0.034	< 0.024	< 0.026	< 0.025	< 0.032
Selenium	mg/k	390	10000	< 0.85	< 0.93	< 0.94	< 0.91	---	< 0.95	< 0.99	< 0.89	< 1.03	< 0.98	< 0.93	< 0.83	< 0.95
Silver	mg/k	200	10000	< 0.42	< 0.47	< 0.47	< 0.46	---	< 0.48	< 0.49	< 0.44	< 0.51	< 0.49	< 0.47	< 0.42	< 0.47
PCBs				< 0.06	< 0.06	< 0.05	< 0.05		< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05

All results reported in milligrams per kilogram (mg/kg) equivalent to parts per million.

Qualifier	Description
All Entries	**Data is summarized above for convenience purposes only. Refer to complete laboratory analytical reports for actual data.**
*	Only those compounds which were detected in at least one sample were summarized above. See laboratory report for a complete list of target analytes.
**	Recorded in parts per million (volume basis), maximum PID value recorded at depth interval specified above.
<	Less than the detection value prsented to the right of the less than symbol.
EL	Elevated Method Reporting Limits due to simple matrix (EL).
J	Reported between Mean Detection Limit and Mean Regulatory Limit.
ND	Not detected.
D	Diluted.
---	Not Analyzed.
Bold	Bold values above RI DEC limits.
Yellow	Detected value is above RIDEC.
Red	Reported above the RIDEC industrial limit.

APPENDIX D

SITE SPECIFIC HEALTH AND SAFETY PLAN

Narragansett Bay Commission

Engineering Design Services for: Phase IIIA-4 OF 210-213-214 Facilities and Phase IIIA-5 OF-217 Facilities

Phase III CSO Control Program – Contract No. 13:308.00D

August 2019

HEALTH & SAFETY PLAN

Revised for Tidewater Property
August 2019
Revised for Tidewater (2)
January 2020

Engineering Design Services for: Phase IIIA-4 OF 210-213-214 Facilities and Phase IIIA-5 OF-217 Facilities

Narragansett Bay Commission

Phase III CSO Control Program – Contract No. 13:308.00D

HEALTH & SAFETY PLAN

Prepared by: BETA GROUP, INC.
Prepared for: Stantec Consulting Ltd.

August 2019

Revised for Tidewater Property
August 2019
Revised for Tidewater Property
January 2020

701 George Washington Hwy
Lincoln, Rhode Island 02865
401.333.2382
www.BETA-Inc.com

Table of Contents

Chapter Title	Page
General Site Information	1
Emergency Notification Procedures	1
Site/Hazard Overview	2
Hazard Assessment	2
General Safety Requirements	8
Personal Protective Equipment	8
Emergency Medical Care	12
Emergency Procedures	13
Signature Page	15
Appendix A: Hospital Location	

1

BETA Health and Safety Plan

This Health and Safety Plan (HASP) has been prepared to identify potential hazards at the referenced site and work practices that should be performed during the field activities. This HASP has been prepared using Appendix C of OSHA 1910.120 Hazardous Waste Operations and Emergency Response as guidance. This HASP applies to activities to be performed by BETA Group, Inc. (BETA) personnel. Any and all subcontractors involved in this project will be responsible for their employee's health and safety and will be required to prepare their own Site-specific HASP.

General Site Information

Site Name: Narragansett Bay Commission
Contract No. 13:308.00D
Phase III Combined Sewer Overflow (CSO) Control Program –
Engineering Design Services for Phase IIIA-4 OF 210-213-214
Facilities and IIIA-5 OF 217 Facilities
Pawtucket, Rhode Island

BETA Project No. 06412.00

Emergency Notification Procedures

In the event of an emergency, notify the following in the order listed:

Fire / Police / Medical Emergency	**911 or *77 (cell Phone)**
Nicholas Corvello, Associate, BETA Group, Inc.	**(401) 333-2382 ext. 137** **(401) 632-6508 (cell phone)**
Christopher Cronin, Vice President, BETA Group, Inc.	**(401) 333-2382 ext. 138** **(401) 525-8008 (cell phone)**
William Skerpan, Vice President, BETA Group, Inc.	**(401) 333-2382 ext. 139** **(401) 447-4503 (cell phone)**
Ken Lento, National Grid Representative	**(617) 791-2627 (cell phone)**

Site/Hazard Overview

Site Description

The project is located within the City of Pawtucket, Rhode Island (the "City") near the western bank of the Seekonk River along Taft Street and Roosevelt Ave. Extension, bound by Main Street to the north and the end of Tidewater Street to the south. A portion of the work will be conducted within the Tidewater site, a known contaminated area.

Tasks

Expected field tasks for this project include:

- Site reconnaissance / visual confirmation of topographic survey information;
- Non man-entry (above-grade) investigation of existing structures;
- Pre-marking for utility location by Dig Safe;
- Soil boring observation;
- Groundwater monitoring well development;
- Soil and groundwater sampling during geotechnical investigation; and
- Handling and management of investigation derived waste.

Hazard Assessment

Hazards of Concern (check as many as apply):

	Traffic Hazards		General Construction	X	**Inorganic Chemicals**
	Confined Space	X	**Physical Hazards**	X	**Organic Chemicals**
	Oxygen Deficient	X	**Biological**		Radiological
X	**Heat Stress**		Man-Entry of Sewers, Drains and Structures	X	**Noise**
X	**Cold Stress**	X	**Volatile compounds**		Other (Specify)

The dangers which may be attributed to these hazards are discussed below.

Heat Stress

During the summer months, warm weather may become a health factor. Personnel working on-site may have to wear protective clothing and respirators, which would increase the chance of workers suffering from heat-related problems. The situation will be monitored periodically on days when the heat index exceeds 75° F. Workers must be briefed on the signs and symptoms of heat-related problems and on preventive measures if work is performed when the heat index exceeds 75° F.

There are three levels of Heat Stress which include the following:

- ⇒ Heat Cramps;
- ⇒ Heat Exhaustion; and
- ⇒ Heat Stroke.

Symptoms for heat cramps include painful muscle spasms. Treatment includes providing liquids with electrolytes. Symptoms for heat exhaustion include weakness, fatigue, dizziness, heavy sweating, headache, nausea, fainting and pale, cool, moist skin. Treatment includes resting in a cool place and providing liquids with electrolytes if the person is conscious; if unconscious, get medical help immediately. Symptoms for heat stroke include very dry, hot skin, mottled blue or red appearance, confusion, convulsions, rapidly rising temperature and unconsciousness. Treatment includes attaining medical attention immediately. **Heat stroke is a life-threatening emergency.**

When tyvek suits are being used and the heat index exceeds 75° F, cool liquids will be available on the Site and a cool down area identified on the Site for breaks.

Cold Stress

Cold injury (frostbite and hypothermia) and impaired ability to work are dangers at low temperatures and when the wind-chill factor is low. "Low" temperatures are subjective as hypothermia can develop at temperatures above 32° F. To guard against cold-stress: wear appropriate clothing; have warm shelter readily available; carefully schedule work and rest periods; and monitor workers' physical conditions.

Physical Hazards

Potential physical hazards at the Site include heavy construction equipment, and uneven terrain. BETA personnel shall note these hazards at each Site location and take necessary precautions. When working around heavy equipment, Level D personal protective equipment shall be utilized.

Biological

Biologicals may be encountered in the form of ticks, mosquitoes, reptiles, rodents and poison oak and ivy. Care should be taken when traversing through overgrown areas. BETA personnel should wear long sleeve shirts and pants, work gloves and steel toe and shank boots.

Volatile Organic Compounds (VOCs)

Total VOCs will be monitored in the air and soil during the drilling and sampling activities. If action levels are exceeded, an increase in personal protective equipment shall be performed.

Corrosives

Corrosive acid preservatives (hydrochloric acid and methanol) are contained in sampling media. Care to prevent skin contact should be taken when collecting samples with media preserved with corrosive acids. Appropriate personal protective equipment should be donned prior to collecting samples with preserved sampling media.

Chemical Exposures

Table 1 summarizes chemicals that could be present on the Site and associated symptoms of acute exposure to such contaminants. Since additional unsuspected hazards may exist at the Site, periodic air quality monitoring and evaluation of site conditions will be performed during all on-site activities. As contaminants-of-concern are identified, this HASP will be modified, if necessary.

Table 1
Possible Chemical Contaminants

Chemical Contaminants*	Potential Hazards	OSHA PEL	NIOSH REL
Arsenic	Harmful if inhaled, ingested, absorbed, or consumed. May cause ulceration of nasal septum, GI disturbances, respiratory irritation, and hyperpigmentation of skin	0.010 mg/m^3	0.002 mg/m^3
Lead	Harmful if inhaled or ingested. May cause weakness, exhaustion, partial paralysis, and kidney disease	0.015 mg/m^3	Not established
Volatile Organics	Toxic by ingestion, inhalation, skin absorption, and eye contact. Irritant to eyes, nose. Headache, dilated pupils, tearing, confusion, dizziness, and nervousness may occur.	benzene: 1 ppm ethylbenzene, toluene, xylenes: 100 ppm Naphthalene: 10 ppm	80 ppm
Polychlorinated Biphenyls	toxic/carcinogenic by ingestion, inhalation and skin absorption	0.5 mg/m^3 (for 8 hrs)	0.001 mg/m^3 (for 8 hrs)
Polynuclear aromatic Hydrocarbons	Harmful if inhaled, and absorbed through skin.	Not established	Not established
Petroleum	Harmful if inhaled, ingested, or consumed. May cause headaches, dizziness, nausea, chemical pneumonitis, and dry cracked skin.	2000 mg/m^3	350 mg/m^3
Cyanide	Eyes, nose, and throat irritation. High exposure to Cyanide can cause Cyanide poisoning with headache, weakness, confusion, nausea, pounding of the heart, coma and even death	5 mg/m^3 (4.7 ppm)	5 mg/m^3

* Refer to Attachment D for NIOSH Chemical Hazards Guides.

Symptoms of Chemical Exposure

On-site workers should be aware of the specific symptoms of acute chemical exposure listed in Table 1. In general, workers should also be aware of some indications of toxic effects of chemical exposure which are described below:

- Observable by others:
  - Changes in complexion, skin discoloration
  - Lack of coordination
  - Changes in demeanor
  - Excessive salivation, papillary response
  - Changes in speech pattern

- Non-observable by others:
  - Headaches
  - Dizziness
  - Blurred vision
  - Cramps
  - Irritation of eyes, skin, or respiratory tract

Noise

Elevated noise levels may be encountered during the project due to construction equipment. Persons working in close proximity to construction equipment shall wear sufficient hearing protection. This hearing protection may include foam ear plugs or foam ear muffs. Hand signals must be used for communication in these situations. Hand signals shall be established and practiced prior to donning protective hearing protection.

On-Site Control

Nicholas Corvello is designated to coordinate access control to the work zone. No unauthorized personnel should enter the work zone without appropriate 40-hour OSHA site worker safety training. Control boundaries within the Tidewater site have been established as follows:

- **Work Zone**: A 20 foot circumference around the drilling location will be treated as the Exclusion Zone.
- Work Zone Perimeter: An area at least 50 feet from the drilling location will be treated as the Work Zone Perimeter. All equipment will be decontaminated in this zone prior to being transferred to the Support Zone.
- **Support Zone**: The area located outside the Work Zone Perimeter.

These control boundaries are subject to change based on varying site conditions.

Monitoring Procedures

Within the Tidewater site, BETA personnel will not enter the Work Zone Perimeter. If entry into this area (within 50 feet of the drilling location) is required, BETA will use a RAE systems MiniRAE Photoionization Detector (PID) with a 10.6 eV lamp and a DustTrack dust monitor to periodically monitor air quality within the breathing zone. The PID and DustTrack will run continuously (with logging) within the Work Zone. Every 2 hours, the PID and DustTrack will be used to collect readings within the Work Zone Perimeter. Logged data will be provided to National Grid daily.

On-Site Personnel

Site Safety Officer:	Nicholas Corvello
Regulatory Authority	RIDEM
Federal Agency Reps.	USEPA
State Agency Reps.	RIDEM
Local Agency Reps.	NBC
Contractors:	Geologic Drilling

Work party(ies) consisting of two people will perform tasks.

Party Team Leader:	Nicholas Corvello (401) 632-6508 (cell)
Rescue Team (in entries to IDLH environment	N/A
Decontamination Team	N/A
Emergency Contact	Christopher Cronin (401) 525-8008 (cell)

General Safety Requirements

The following General Safety Procedures shall be followed by all persons entering and/or working on the Site:

- No employee may be allowed on Site without the prior knowledge and consent of the Site Safety Officer and review of these Health and Safety Procedures.
- Each contractor and subcontractor on the Site is responsible for their own Health and Safety Program and Health and Safety Plan.
- A subcontractor's Health and Safety Plan must be at least as protective as that developed herewithin.
- There will be no activities conducted on Site without sufficient backup personnel. At a minimum, two persons must be present at the site except for routine site reconnaissance activities.
- All contractor or subcontractor personnel shall bring to the attention of the Site Safety Officer or Supervisors any unsafe condition or practice associated with the site activities that they are unable to correct themselves.
- There will be no smoking, eating, chewing gum or tobacco, applying cosmetics or drinking in restricted areas.
- Hands shall be thoroughly cleaned prior to smoking, eating or other activities outside restricted areas.
- Team members must avoid unnecessary contamination, where applicable (i.e., walking through known or suspected restricted zones or contaminated puddles, kneeling or sitting on the ground, leaning against potentially contaminated barrels or equipment).
- Respiratory devices may not be worn with beards, long sideburns, or under other conditions that prevent a proper seal.
- No visitors will be allowed access without the knowledge and consent of the Site Manager and/or Safety Officer. All visitors will be required to be briefed on safety procedures and will be required to be escorted while on Site.

Personal Protective Equipment

Based on an evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks.

Location	Job Function	Level of Protection				
Exclusion Zone	Non Man-Entry Structure Inspections	A	B	C	(D)	Other
	Soil / Groundwater Sampling	A	B	C	(D)	Other
Contamination Reduction Zone	Decontamination	A	B	C	(D)	Other
Support Zone	Support vehicle(s)	A	B	C	(D)	Other

Action Levels and Personnel Protection

For BETA personnel outside of the Work Zone Perimeter at the Tidewater site, the general level of personnel protection will be Level D. If entry into this area (within 50 feet of the drilling location) is required, the following table lists the appropriate action level within each zone. (Action items reference GZA Health and Safety Plan for Tidewater Site included in RAWP)

Location	Action Level	Response
Work Area	1 ppm to 10 ppm TVOC	Temporarily halt work activities (5 minutes minimum) and continue to monitor levels
	1 mg/m^3 of dust in the ambient air	Implement dust control measures (water)
	Persistently > 10 ppm	Temporarily halt work activities ID source of vapors, complete corrective action to mitigate vapors, continue to monitor levels, resume work f levels drop below 10 ppm. If levels persist upgrade to level C. If sustained (1-5 minutes) breathing zone registers 1ppm or greater, monitor for benzene using a Draeger table.
Work Area Perimeter	0.1 ppm TVOC	Temporarily halt work activities (5 minutes minimum) and continue to monitor levels
	0.150 mg/m^3 of dust in the ambient air	Implement dust control measures (water)
	Persistently > 10 ppm	Temporarily halt work activities ID source of vapors, complete corrective action to mitigate vapors, continue to monitor levels, resume work f levels drop below 10 ppm. If levels persist upgrade to level C. If sustained (1-5 minutes) breathing zone registers 1ppm or greater, monitor for benzene using a Draeger table.Upgrade to level C

Level D personal protection will include:

The initial level of personal protection for all field activities will be Level D.

- Coveralls or work uniform
- High-visibility safety vest or clothing
- Gloves
- Boots/shoes, leather or chemical-resistant, steel toe and shank.
- Rubber overboots (in wet environments)
- Safety glasses or chemical splash goggles (optional unless required for specific job function).
- Hard hat
- Hearing protection

Level C Personal Protection will be required only if contaminants are discovered and an upgrade to Level C Personal Protection is required for BETA employees to conduct their work.

Level D (modified) personnel protection will include:

- Tyvek coveralls;
- Hard hat;
- Boots/shoes, steel toe and shank;
- Chemical-resistant outer boots;
- Inner and outer gloves; and
- Hearing protection.

Level C personnel protection will include:

- Tyvek coveralls
- Air purifying respirator with dust and organic vapor cartridge (full-faced mask)
- Hard hat
- Boots/shoes, steel toe and shank
- Chemical-resistant outer boots
- Inner and outer gloves
- Hearing protection.

Decontamination Procedures

Level D Decontamination Procedures

The decontamination procedure for **Level D** requires the disposal of gloves and boot covers (if used) in plastic lined containers on-site. Non-disposal equipment will be cleaned according to the following Standard Operating Protocols:

- Wash with Alconox detergent (or soap) and water
- Rinse with deionized water

Level C Decontamination Procedures

Level C Decontamination will be required for BETA employees to conduct their work only if contaminants are discovered . The decontamination procedures to be utilized for **Level C** site conditions will consist of the following nine-step process:

- Sampling devices, monitoring instruments and other equipment used on Site will be segregated on polyethylene sheeting and decontaminated as necessary.
- Outer boots and gloves will be washed with soap and water and then rinsed with water or appropriately disposed.
- Tape around outer boots and gloves will be removed and deposited into a polyethylene-lined container.
- Outer boots will be removed and placed on the polyethylene.
- Outer gloves will be removed and disposed of in polyethylene-lined containers.
- Tyvek coveralls will be removed and disposed of in polyethylene-lined containers.
- Respirator will be removed and washed with clean water and sanitized.
- Inner gloves will be removed and disposed in a polyethylene-lined container.
- Worker's hands and face will be washed with soap and water before leaving the Site.

Personnel and equipment leaving the Exclusion Zone shall be thoroughly decontaminated. The standard **Level D** Decontamination Protocol shall be instituted at the decontamination stations.

Emergency Medical Care

The following are qualified on-site First Aid Responders and/or EMTs: None

First Aid equipment is available on-site at the following locations:

First Aid Kit: Located in field vehicle

Emergency Eye Wash: Located in field vehicle

Emergency Shower: None

Other (Specify): _____

Site Resource(s) and Locations.

Water Supply: Located in field vehicle

Telephones: Personnel will carry personal cell phones at all times

Communication Systems: Same as above

Other: _____

Table 1
Emergency Information and Local Resources,

City of Pawtucket, MA

Public and Private Resources	Telephone Numbers
Pawtucket Fire/Police/Medical Emergency	911
Hospital Emergency	911
Pawtucket Police Department, non-emergency	401-729-5846
Pawtucket Fire Department, non-emergency	401-725-1422
Pawtucket Department of Public Works	401-728-0500 x236
Pawtucket Water Supply Board	401-729-5005
Narragansett Bay Commission	401-461-8848
National Grid Gas Emergency Center	1-800-640-1595
National Grid Electric	1-800-465-1212
Verizon	1-800-870-9999
Cox Communications	1-888-633-4266
Regional Center for Poison Control and Prevention	1-800-222-1222
National Response Center	1-800-424-8802

Nearest Hospital: The Miriam Hospital – 401-793-2500
164 Summit Ave., Providence RI

Refer to Appendix A for Hospital locations.

Emergency Procedures

The following standard emergency procedures will be used by on-site personnel. These procedures may be modified as appropriate and required for each incident. The Site Safety Officer will be notified of any on-site emergencies and will be responsible for ensuring that the appropriate procedures are followed.

- **Fire/Explosion:** The fire department will be notified and all personnel moved to a safe distance from the involved area.
- **Personal Protective Equipment Failure:** If any site worker experiences a failure or malfunction of personal protective equipment that adversely affects the protection factor, that person and his/her buddy will immediately leave the Exclusion Zone. Re-entry will not be permitted until the equipment has been repaired or replaced.
- **Other Equipment Failure:** If any other equipment on-site fails to operate properly, the Site Manager and Site Safety Officer will be notified and will then evaluate the effect of such failure on continuing operations. If the failure affects personnel safety or prevents completion of the investigation activities, all personnel will leave the Exclusion Zone until the situation is remedied through appropriate action(s).

First Aid

General first aid procedures for exposure include, but are not limited to, the following procedures:

- If contaminant contacts the eyes, irrigate immediately with large amounts of water
- If contaminant contacts skin, wash with soap and water promptly
- If contaminant is inhaled, move the exposed person to fresh air at once. If the worker's breathing has stopped, call 911 and request appropriate medical attention as soon as possible using telephone number(s) listed in Table 1 (Emergency Information and Local Resources). If appropriately trained and currently certified by the Red Cross, perform artificial respiration.

On-site BETA personnel will keep a First-Aid kit at the Site during inspection activities.

Signature Page

I have read, understood, and agree to comply with the provisions set forth in this Site-specific Health and Safety Plan and as reviewed in the Health and Safety briefing by the Site Safety Officer.

Prepared By:

Joseph McLoughlin	_____	__
Health and Safety Coordinator	Signature	Date

Approved By:

Joseph D'Alesio	_____	__
Sr. Vice President	Signature	Date
Nicholas Corvello	_____	__
Site Safety Officer	Signature	Date

Site Personnel

Signature	Affiliation	Date

Appendix A
Hospital Location

APPENDIX E

SOIL BORING AND MONITORING WELL LOGS

SOIL

Soil description on logs of subsurface explorations are based on Standard Penetration Test (SPT) results, visual-manual examination of exposed soil samples, and the results of laboratory tests on selected samples. The criteria, descriptive terms, and definitions are presented herein.
The natural soils are identified and described by visual-manual procedures (ASTM D2488) and in accordance with the United Soil Classification System (USCS) (ASTM D2487) as practiced by McMillen Jacobs Associates. Fill materials may not be classified by USCS criteria.

PENETRATION RESISTANCE

Standard penetration resistance (SPT) (ASTM D1586) - Number of blows required to drive a standard 2 in. O.D. split spoon sampler one foot with a 140 lb. weight falling 30 inches freely downward.

DENSITY / CONSISTENCY

Coarse - Grained Soils	
Apparent Density	SPT Resistance, N (BPF)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

Fine - Grained Soils	
Apparent Consistency	SPT Resistance, N (BPF)
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

Notes: BPF = Blows Per Foot (uncorrected)

WOR = Weight of Rod

COLOR

Basic colors (black, brown, gray, olive, red, and yellow) and combinations (i.e. gray-brown, olive-brown, olive-gray, red-gray, red-brown, yellow-brown, and red-yellow). Modifiers such as light and dark may be used.

SUPPLEMENTAL SOIL DESCRIPTIONS AND STRUCTURE:

Laminating	- 0 to 1/16 in. thick (cohesive)
Parting	- 0 to 1/16 in. thick (granular)
Seam	- 1/16 to 1/2 in. thick
Layer	- 1/2 to 12 in. thick
Stratum	- > 12 in. thick
Pocket	- Small, erratic deposit less than 12 in. size
Lens	- Lenticular deposit larger than a pocket
Occasional	- One or less per 12 in. of thickness
Frequent	- More than one per 12 in. of thickness
Interbedded	- Alternating soil layers of differing composition
Varved	- Alternating thin seams of silt and clay
Mottled	- Variation of color

SAMPLE SYMBOLS

- SPT Sample 2 in. OD
- X SPT Sample 3 in. OD
- Shelby Tube Sample

ADDITIONAL GRAPHIC DESCRIPTIONS

- Asphalt
- Fill

SOIL IDENTIFICATION AND DESCRIPTION

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS Based on ASTM D2488 & D2487)

MAJOR DIVISIONS			GROUP/SYMBOL	TYPICAL DESCRIPTION
COARSE-GRAINED SOILS (50% or more retained on No. 200 sieve)	GRAVELS (more than 50% retained on No. 4 sieve)	CLEAN GRAVELS (less than 5% fines)	GW	WELL-GRADED GRAVEL
			GP	POORLY GRADED GRAVEL
		GRAVELS (with 5 to 12% fines)	GW-GM	WELL-GRADED GRAVEL WITH SILT
			GW-GC	WELL-GRADED GRAVEL WITH CLAY
			GP-GM	POORLY GRADED GRAVEL WITH SILT
			GP-GC	POORLY GRADED GRAVEL WITH CLAY
		GRAVELS WITH FINES (more than 12% fines)	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SANDS (less than 50% retained on No. 4 sieve)	CLEAN SANDS (less than 5% fines)	SW	WELL-GRADED SAND
			SP	POORLY GRADED SAND
		SANDS (with 5 to 12% fines)	SW-SM	WELL-GRADED SAND WITH SILT
			SW-SC	WELL-GRADED SAND WITH CLAY
			SP-SM	POORLY GRADED SAND WITH SILT
			SP-SC	POORLY GRADED SAND WITH CLAY
		SANDS WITH FINES (more than 12% fines)	SM	SILTY SAND
			SC	CLAYEY SAND
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS & CLAYS (liquid limit less than 50)	INORGANIC	ML	SILT
			CL	LEAN CLAY
		ORGANIC	OL	LOW PLASTICITY ORGANIC CLAY
	SILTS & CLAYS (liquid limit greater than 50)	INORGANIC	MH	ELASTIC SILT
			CH	FAT CLAY
		ORGANIC	OH	HIGH PLASTICITY ORGANIC CLAY
	SILT/CLAY (liquid limit between 12 and 25)	INORGANIC	CL-ML	CLAYEY SILT / SILTY CLAY
HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT	PEAT

Notes:

1. Dual symbols (symbols separated by a hyphen, e.g. SP-SM, slightly silty fine SAND) are used for soils between 5% and 12% fines or when liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

ROCK

Rock descriptions noted on logs of subsurface explorations are based on visual-manual examination of exposed rock outcrops and core samples. The criteria, descriptive terms and definitions used are as follows:

FIELD HARDNESS / STRENGTH

(after ISRM, 1978; CGS, 1985; Marinos & Hoek, 2001)

Extremely Strong	Cannot be scratched with a knife point or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Strong	Cannot be scratched with a knife point or sharp pick; core breaks with repeated heavy hammer blows.
Strong	Can be scratched with a knife or pick; core breaks with heavy hammer blow.
Moderately Weak	Can be grooved 1/16 in. deep by knife or sharp pick; core breaks with light hammer blow.
Weak	Can be grooved easily with a knife or pick; can be scratched with fingernail; core breaks with light pressure.
Very Weak	Can be readily indented; grooved with fingernail or carved with a knife; core beaks with light pressure.

WEATHERING (after ISRM, 1978)

The action of organic and inorganic chemical and physical processes resulting in alteration of color, texture, and composition

Fresh	No visible sign of alteration, except perhaps slight discoloration on major discontinuity surfaces
Slight	Discoloration of rock material and discontinuity surfaces
Moderate	Less than half the rock material decomposed to soil. Some fresh rock; continuous "framework".
High	More than half the rock material decomposed and/or disintegrated to soil.
Completely	All rock material disintegrated to soil, but mass still intact
Residual Soil	All rock material converted to soil. Material has not been significantly transported.

COLOR:

Basic colors and combinations: gray, light gray, brown, red-brown

TEXTURE

Size, shape and arrangements of constituents

Aphantic	Individual grains invisible
Fine-grained	Grains barely visible to the unaided eye, up to 1/16 in. dia.
Medium Grained	Grains between 1/16 and 3/16 in. dia.
Coarse Grained	Grains between 3/16 and 1/4 in. dia.
Very Coarse Grained	Grains larger than 1/4 in. dia.

LITHOLOGY

Rock Classification and modifiers; accepted formation names

DISCONTINUITIES:

Type	Definition
Joint	A natural fracture along which no displacement has occurred. May occur in parallel groups called sets.
Shear	A natural fracture along which displacement has occurred. Surface may be slickensided or striated.
Fault	A natural fracture along which displacement has occurred. Usually lined with gouge and slickensides.
Shear or Fault Zone	Zone of fractured rock and gouge bordering the displacement plane.

ORIENTATION / ATTITUDE

Term	Angle (degrees)
Horizontal	0-5
Low Angle	6-35
Moderately Dipping	36-55
High Angle	56-85
Vertical	86-100

SPACING

Term	Inches
Extremely Close	<3/4
Very Close	3/4 - 2-1/2
Close	2-1/2 - 8
Moderate	8 - 24
Wide	24 - 80
Very Wide	80- 20 ft.
Extremely Wide	> 20 ft.

ROUGHNESS OF DISCONTINUITY SURFACE

Term	Abbreviation	Description
Very Rough	VR	Near-vertical steps and ridges
Rough	R	Ridges, side-steps, and asperities evident; abrasive to the touch
Slightly Rough	SR	Asperities can be felt.
Smooth	SM	Smooth to the touch
Slickensided	SL	Smooth glossy finish with visible striations

APERTURE/GAP

Term	MM
Very Tight	< .1
Tight	0.1 - 0.25
Partly Open	0.25 - 0.5
Open	0.5 - 2.5
Moderately Wide	2.5 - 10
Wide	> 10
Very Wide	10 - 100
Extremely Wide	100 - 1000
Cavernous	> 1000

INFILLING

Material	Abbreviation
Clay	CL
Silt	SI
Sand	SA
Serpentine	SE
Sulfide	SL
Calcite	CA
Pyrite	PY
Quartz	QZ
Chlorite	CH
Iron Oxide Staining	FE
Could not be determined	X

BEDDING

Term	Inches	Term	Inches
Very Thin	< 2.5	Thick	25-36
Thin	2.5 - 8	Very Thick	< 36
Medium	9 - 24		

GENERAL NOTES:

1. Logs of subsurface exploration depict soil, rock and groundwater conditions only at the boring locations specified on the dates indicated. Subsurface conditions may vary at other locations and at other times.
2. Water levels, where noted on the logs, were measured at the times under the conditions indicated. During test boring drilling, these water levels could have been affected by the introduction of water in to the borehole, extraction of tools or other procedures and thus may not reflect actual groundwater levels at the test boring location. Groundwater level fluctuations may also occur as a results of variations in precipitation, temperature, season, tides, river stage, adjacent construction operations, construction dewatering systems, water supply well pumping, and other conditions.

McMILLEN JACOBS ASSOCIATES

SUBSURFACE EXPLORATION KEY

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-1

Date(s) Drilled	09/05/2019 - 09/06/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	22.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	14.5 ft / NGVD 1929		
Location	Southerly end of Tidewater Site	Coordinates	360205.11E,285935.78N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
10		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	13/24	18-18-17-20 (N=35)	SM		Moist, dense, brown, fine SAND and gravel, little silt (FILL)	PID=0
5		10	8-10	S-2	10/24	14-30-22-19 (N=52)	SP-SM		Moist, very dense, brown, fine SAND, some gravel (FILL)	
0	▽	15							Top of possible boulder/bedrock. See Core Boring Report for rock details.	
			15-16.9	S-3	14/23	16-27-31-50/5" (N=58)	SW-SM		Wet, very dense, gray, SAND, some gravel and silt (Completely Weathered Bedrock)	PID=30
-5									See Core Boring Report for Rock Details	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-1

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-1

Date(s) Drilled:	09/05/2019 - 09/06/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	22.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	14.5 ft / NGVD 1929		
Location:	Southerly end of Tidewater Site	Coordinates:	360205.11E,285935.78N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
			4						See Test Boring Report for Overburden Details							
			4													
		10-15	3	2	C-1	24/ 40%	20/ 33%		Strong, gray, moderately weathered, medium-grained CONGLOMERATE. Mechanical breaks at 10.5 ft, 11.3 ft, and 11.8 ft.							
			1													
0			2													
	15								Sample obtained using split spoon sampler. See Test Boring Report for details.							
			2							17.3	J	30	S	1.00	FR	
		17-22	2	2	C-2	45/ 75%	17/ 28%		Strong, gray, moderately weathered, fine-grained SILTSTONE	18.8	J	30	SR	1.00	FR	
										19.1	J	40	SR	1.00	FR	
-5			2							19.8	J	40	SR	1.00	FR	

McMILLEN JACOBS ASSOCIATES

Boring B-1

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-1

Date(s) Drilled:	09/05/2019 - 09/06/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	22.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	14.5 ft / NGVD 1929		
Location:	Southerly end of Tidewater Site	Coordinates:	360205.11E,285935.78N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		17-22	6 5	2	C-2	45/ 75%	17/ 28%		Strong, gray, moderately weathered, fine-grained SILTSTONE	20.0 20.1	J J	30 30	SR R	5.00 5.00	FR FR	
-10	25								Bottom of borehole at 22.0 ft.							
-15																

McMILLEN JACOBS ASSOCIATES

Boring B-1

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-2

Date(s) Drilled	09/03/2019 - 09/05/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	34.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	22.2 ft / NGVD 1929		
Location	Tidewater Site	Coordinates	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
18		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	24/24	2-1-2-4 (N=3)	CL		Moist, soft, grayish brown, silty CLAY (FILL)	PID=20
13			8-10	S-2	18/24	1-1-0-3 (N=1)	ML		Moist, very soft, gray, SILT (FILL)	PID=32
	▽	10	10-12	S-3	12/24	1-4-1-17 (N=5)	ML		Wet, medium stiff, light gray, SILT, some gravel, little fine sand (FILL)	PID=50
			12-14	S-4	12/24	9-6-7-12 (N=13)	SP		Wet, medium dense, brown, medium SAND some gravel, little silt (FILL)	PID=20
8		15	14-16	S-5	8/24	8-8-5-8 (N=13)	SW-SM		Wet, medium dense, brown, coarse to fine SAND, some gravel, trace fines (ALLUVIUM)	PID=3
			16-18	S-6	20/24	7-3-3-11 (N=6)	ML		Wet, medium stiff, light brown, SILT, some fine sand (ALLUVIUM)	PID=0
3			18-20	S-7	9/24	9-7-6-9 (N=13)			Wet, medium dense, brown, fine to medium SAND, some silt (ALLUVIUM)	PID=0

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-2

Date(s) Drilled	09/03/2019 - 09/05/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	34.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	22.2 ft / NGVD 1929		
Location	Tidewater Site	Coordinates	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
					SM		Wet, medium dense, brown, fine to medium SAND, some silt (ALLUVIUM)	Occasional rig chatter starting at 21'
-2								
25	24-26	S-8	6/24	9-8-8-8 (N=16)	SC		Wet, medium dense, gray and brown SAND, some clay, little gravel (GLACIAL TILL)	
	29-29	S-9	0/0	50/0"				
-7								
30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-12								
35								
-17								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-2

Date(s) Drilled: 09/03/2019 - 09/05/2019	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: S. Wilbur	Checked By: W. Kilker
Drilling Method/ Rig Type: Mud Rotary/CME 45	Drilling Contractor: Geologic Earth Exploration, Inc.	Total Depth of Borehole: 34.0 ft	
Borehole Diameter: 4.00 in	Core Barrel Type / Size: NX / 2 in	Ground Surface Elevation/Datum: 22.2 ft / NGVD 1929	
Location: Tidewater Site	Coordinates: 359851.53E,286363.91N	Elevation Source Field Survey	

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
-2	25								See Test Boring Report for Overburden Details							
-7		29-34	5	1	C-1	56/ 93%	36/ 60%		Strong, fresh, gray, medium-grained SANDSTONE	29.5	J	40	SR	1.00	FR	

McMILLEN JACOBS ASSOCIATES

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-2

Date(s) Drilled:	09/03/2019 - 09/05/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	34.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	22.2 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359851.53E,286363.91N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
			4							30.7	J	40	SR	5.00	FR	
			4							31.2	J	40	S	1.00	FR	
										31.6	J	20	S	5.00	FR	
										31.8	J	30	S	1.00	FR	
		29-34		1	C-1	56/ 93%	36/ 60%		Strong, fresh, gray, medium-grained SANDSTONE	32.0	J	20	SR	1.00	FR	
			4							32.8	J	20	SR	1.00	SL	
										32.9	J	20	S	1.00	FR	
										33.0	J	20	S	1.00	FR	
										33.2	J	10	S	1.00	FR	
			4							33.3	J	40	SR	5.00	FR	
										33.5	J	20	S	1.00	FR	
										33.7	J	20	R	5.00	SL	
-12									Bottom of borehole at 34.0 ft.							
	35															
-17																

McMILLEN JACOBS ASSOCIATES

Boring B-2

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-3

Date(s) Drilled	09/06/2019 - 09/09/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	37.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	37.4 ft / NGVD 1929		
Location	Northwestern corner of Tidewater Site	Coordinates	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
33		5								
									Drilled from 6 to 8 ft without sampling (FILL)	Rig Chatter/Slow Drilling
			8-10	S-1	19/24	15-35-20-19 (N=55)				PID=0
28		10					SP-SM		Moist, very dense, brown, SAND, little gravel and silt. Fragments of brick. (FILL)	
23	▽	15	14-16	S-2	9/24	14-10-9-8 (N=19)				PID=0
							SM		Wet, medium dense, tan, coarse to fine SAND, trace gravel and fines (ALLUVIUM)	
18									Wet, medium dense, tan, coarse to fine SAND, trace gravel and fines (ALLUVIUM)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-3

Date(s) Drilled	09/06/2019 - 09/09/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	37.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	37.4 ft / NGVD 1929		
Location	Northwestern corner of Tidewater Site	Coordinates	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	19-21	S-3	9/24	10-9-9-9 (N=18)	SM		Wet, medium dense, tan, coarse to fine SAND, trace gravel and fines (ALLUVIUM)	PID=0
13	23-25	S-4	10/24	15-21-26-38 (N=47)	CL-GC		Wet, hard, brown, sandy CLAY and coarse to fine gravel (GLACIAL TILL)	PID=0
25	25-27	S-5	13/24	16-34-34-28 (N=68)	SM-GM		Wet, very dense, brown, SAND and gravel, little silt (GLACIAL TILL)	PID=0
8 30 3 35 -2							Top of Bedrock at 27.0 ft. See Core Boring Report for rock details.	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-3

Date(s) Drilled:	09/06/2019 - 09/09/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	37.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	37.4 ft / NGVD 1929		
Location:	Northwestern corner of Tidewater Site	Coordinates:	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
13	25								See Test Boring Report for Overburden Details							
			3						Strong, slightly weathered, purple, fine-grained SILTSTONE. No water return while coring run C-1.	27.3	J	30	SR	1.00	FR	
										27.4	J	30	SR	1.00	FR	
		27-32	1	2	C-1	22/ 37%	14/ 24%			28.4	J	20	SR	1.00	FR	
8			2													

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-3

Date(s) Drilled:	09/06/2019 - 09/09/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	37.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	37.4 ft / NGVD 1929		
Location:	Northwestern corner of Tidewater Site	Coordinates:	359575.63E,286640.16N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		27-32	1 2	2	C-1	22/ 37%	14/ 24%		Strong, slightly weathered, purple, fine-grained SILTSTONE. No water return while coring run C-1.							
3	35	32-37	2 2 2 1 4	2	C-2	16/ 27%	0/ 0%		Strong, slightly weathered, purple to gray, fine-grained SILTSTONE. No water return while coring run C-2.							
-2									Bottom of borehole at 37.0 ft.							

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4A

Date(s) Drilled	08/28/2019 - 08/28/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	8.9 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates		Elevation Source	Google Earth		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	13/18	23-24-30 (N=54)	SP		Moist, very dense, reddish brown, coarse to fine SAND, little gravel (FILL)	PID=0
			2-4	S-2	10/24	23-26-21-16 (N=47)	SP-SM		Moist, dense, gray, medium to fine SAND, some gravel, little fines (FILL)	PID=0
15	▽	5	4-6	S-3	10/24	19-19-10-5 (N=29)	ML-SM		Wet, very stiff, light brown, medium to fine sandy SILT, little gravel. Fragments of brick and glass. (FILL)	PID=0
			6-8	S-4	6/24	5-5-6-13 (N=11)	SP-SM		Wet, medium dense, dark brown, medium to fine SAND, some gravel, trace fines (FILL)	
			8-8.9	S-5	4/11	71-50/5" (N=50/5")	SP-SM		Wet, very dense, light brown, coarse to fine SAND, some gravel, trace silt. Pieces of concrete. (FILL)	PID=0
10		10							Bottom of borehole at 8.9 ft.	
									Pieces of possible concrete in tip of sampler. Relocated to new location at Boring B-4B.	
5		15								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4B

Date(s) Drilled	08/28/2019 - 08/28/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	10.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates		Elevation Source	Google Earth		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
15		5							No sampling from 0 to 8 ft (FILL)	Offset hole about 1 ft from B-4A and continued drilling and sampling from 8 ft below ground surface.
	▽		8-10	S-1	14/24	15-12-14-23 (N=26)	SP-SM		Wet, medium dense, light brown, medium to fine SAND, some gravel, trace fines (FILL)	PID=0
10		10							Bottom of borehole at 10.0 ft. Pieces of possible concrete in tip of sample. Relocated to new location at Boring B-4C.	
5		15								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4B

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4C

Date(s) Drilled	08/29/2019 - 08/29/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates	359477.61E,288205.01N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
15		5							No sampling from 0 to 9.5 ft (FILL)	Offset hole about 3 ft from B-4B and continued drilling and sampling from 9.5 ft below ground surface. Occasional rig chatter from 0 to 9.5 ft.
10		10	9.5-11.5	S-1	14/24	18-18-29-23 (N=47)	SP		Dry, dense, light brown, coarse to fine SAND, some gravel, trace fines. Possible concrete. (FILL)	PID=0
5		15	14-16	S-2	10/24	15-10-10-15 (N=20)	SP-SM		Moist, dense, light brown, coarse to fine SAND, little gravel, trace fines (FILL)	PID=0
	▽						GP		Wet, dense, dark brown, GRAVEL, little sand, trace fines (FILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4C

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-4C

Date(s) Drilled	08/29/2019 - 08/29/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	19.9 ft / NGVD 1929		
Location	Taft St north of I-95 bridge	Coordinates	359477.61E,288205.01N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
			19-21	S-3	14/24	10-23-18-12 (N=41)	ML-SM		Wet, hard, red, SILT and fine to medium SAND, trace gravel (GLACIOFLUVIAL)	PID=0
-5		25	24-26	S-4	13/24	38-29-20-16 (N=49)	GP-GM		Wet, dense, gray, coarse to fine GRAVEL, little sand (GLACIAL TILL)	PID=0 Rig Chatter
			29-29.5	S-5	6/6	70-50/0"	ML		Wet, very stiff, gray, sandy SILT, little gravel (GLACIAL TILL)	
-10		30							Top of Bedrock at 29.5 ft. See Core Boring Report for rock details.	
-15		35								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-4C

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-4C

Date(s) Drilled:	08/29/2019 - 08/29/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	35.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	19.9 ft / NGVD 1929		
Location:	Taft St north of I-95 bridge	Coordinates:	359477.61E,288205.01N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
			3						See Test Boring Report for Overburden Details							
			4													
		30-35	4	1	C-1	60/ 100%	26/ 43%		Strong, slightly weathered, purple, fine-grained SILTSTONE							
			4							33.4	J	40	S	1.00	FR	
										33.5	J	40	SR	1.00	FR	
			4							34.2	J	50	SR	1.00	FR	
										34.5	J	40	SR	1.00	FR	
-15	35									34.6	J	10	S	1.00	FR	
									Bottom of borehole at 35.0 ft.							
-20																

McMILLEN JACOBS ASSOCIATES

Boring B-4C

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-5

Date(s) Drilled	08/27/2019 - 08/27/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	26.8 ft / NGVD 1929		
Location	Intersection of Taft St. and Jenks Way	Coordinates	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	14/18	44-30-30 (N=60)	SM		Dry, very dense, dark gray, coarse to fine SAND, little gravel and silt (FILL)	PID=0
			2-4	S-2	15/24	22-23-19-16 (N=42)	SM		Dry, very dense, light brown, medium to fine SAND, little silt, trace gravel (FILL)	PID=0
22		5	4-6	S-3	6/24	15-8-5-4 (N=13)	GP		Moist, medium dense, gray, coarse GRAVEL (FILL)	
			6-8	S-4	10/24	7-10-12-5 (N=22)	SM		Moist, medium dense, dark gray, coarse to fine SAND and GRAVEL, little silt (FILL)	PID=0
			8-10	S-5	0/24	7-6-6-6 (N=12)			No recovery. Gravel stuck in tip of sampler. (FILL)	PID=0
17		10	10-12	S-6	11/24	5-6-6-7 (N=12)	ML		Moist, stiff, light brown SILT, trace gravel (FILL)	PID=0
	▽									
12		15	14-16	S-7	9/24	5-7-5-3 (N=12)	GW		Wet, medium dense, gray, coarse to fine GRAVEL, little sand, trace fines. Fragments of brick. (FILL)	PID=0 Cobble from 16-17.5 ft
7									Wet, dense, brownish-gray, coarse GRAVEL and sand, little silt (GLACIAL TILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-5

Date(s) Drilled	08/27/2019 - 08/27/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	35.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	26.8 ft / NGVD 1929		
Location	Intersection of Taft St. and Jenks Way	Coordinates	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	▽		19-21	S-8	10/24	10-21-19-29 (N=40)	GM		Wet, dense, brownish-gray, coarse GRAVEL, little sand and silt (GLACIAL TILL)	PID=0
-2		25	24-26	S-9	12/24	13-16-19-29 (N=35)	SM		Wet, dense, brownish-gray, SAND, some gravel, little silt (GLACIAL TILL)	PID=0
-3		30							Top of Bedrock at 27.0 ft. See Core Boring Report for rock details.	
-8		35								
-13										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-5

Date(s) Drilled:	08/27/2019 - 08/27/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	35.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	26.8 ft / NGVD 1929		
Location:	Intersection of Taft St. and Jenks Way	Coordinates:	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
2	25								See Test Boring Report for Overburden Details							
		27-32	2	1	C-1	58/ 97%	47/ 78%		Strong, fresh, gray, medium-grained SANDSTONE	28.9	J	40	SR	5.00	FR	
			2													
			2													
-3																

McMILLEN JACOBS ASSOCIATES

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-5

Date(s) Drilled:	08/27/2019 - 08/27/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	35.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	26.8 ft / NGVD 1929		
Location:	Intersection of Taft St. and Jenks Way	Coordinates:	359511.82E,288453.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		27-32	4 5	1	C-1	58/ 97%	47/ 78%		Strong, fresh, gray, medium-grained SANDSTONE	30.5 30.6	J J	40 40	SR SR	5.00 5.00	FR FR	
-8	35	32-35	3 3	1	C-2	32/ 90%	24/ 67%		Strong, fresh, gray, fine-grained SILTSTONE	32.6 33.7	J J	40 30	SR R	1.00 5.00	FR FR	
-13									Bottom of borehole at 35.0 ft.							

McMILLEN JACOBS ASSOCIATES

Boring B-5

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-6

Date(s) Drilled	08/29/2019 - 08/29/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	4.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum			
Location	On Roosevelt Ave Ext. north of Jenks Way	Coordinates		Elevation Source	Google Earth		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	10/18	9-9-11 (N=20)	SW		Moist, medium dense, brown, coarse to fine SAND with gravel, trace silt (FILL)	
			2-4	S-2	15/24	5-5-6-39 (N=11)	SP		Moist, medium dense, dark brown, medium to fine SAND, little gravel, trace silt. Trace brick fragments. Possible concrete in tip. (FILL)	
-5		5							Bottom of borehole at 4.0 ft. Pieces of possible concrete in tip of sampler. Relocated to new location at Boring B-6A.	
-10		10								
-15		15								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-6

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-6A

Date(s) Drilled	09/18/2019 - 09/18/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	25.4 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. north of Jenks Way	Coordinates	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
21		5								
			6-8	S-1	8/24	7-4-5-8 (N=9)	SM		Moist, loose, brown, medium to fine SAND, little silt. Black sand in tip of sampler. (FILL)	PID=0
16			8-10	S-2	8/24	10-14-20-15 (N=34)	SP-SM		Moist, dense, brown to black, medium to fine SAND, trace silt (FILL)	PID=0
	▽	10	10-12	S-3	10/24	7-6-4-3 (N=10)	SP-SM		Wet, medium dense, dark brown, medium to fine SAND, little gravel, trace fines (FILL)	Water loss while drilling from 10-14 ft PID=0
11		15	14-16	S-4	8/24	12-5-13-9 (N=18)	SP-SM		Wet, medium dense, gray, SAND, some coarse to fine gravel, little silt. Pieces of glass. (FILL)	PID=0
6									Wet, very dense, gray, SAND and gravel, little silt (GLACIAL TILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-6A

Date(s) Drilled	09/18/2019 - 09/18/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	25.4 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. north of Jenks Way	Coordinates	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
			19-21	S-5	15/24	26-35-39-38 (N=74)	SM		Wet, very dense, gray, SAND and GRAVEL, little silt (GLACIAL TILL)	PID=0 Rig Chatter
			24-24.1	S-6	1/1	50/1"				
1		25					GW		Wet, very dense, gray, coarse to fine GRAVEL, little silt (GLACIAL TILL)	Rig Chatter
									Top of Bedrock at 26.0 ft. See Core Boring Report for rock details.	Rollerbit from 24.1 ft to 26 ft and hit refusal
-4		30								
-9		35								
-14										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-6A

Date(s) Drilled:	09/18/2019 - 09/18/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.4 ft / NGVD 1929		
Location:	On Roosevelt Ave Ext. north of Jenks Way	Coordinates:	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
1	25								See Test Boring Report for Overburden Details							
		26-31	3	3	C-1	59/ 98%	34/ 57%		Strong, fresh, gray, fine-grained SILTSTONE	26.5	J	40	R	1.00	FR	
										26.7	J	40	SR	1.00	FR	
										26.9	J	30	SR	1.00	SL	
			5							27.6	J	30	SR	1.00	FR	
										27.6	J	20	S	1.00	FR	
										27.9	J	40	S	1.00	SL	
										28.0	J	10	S	1.00	FR	
			4							28.2	J	40	SR	1.00	FR	
										28.7	J	40	S	1.00	FR	
										28.8	J	40	SR	1.00	FR	
										29.0	J	30	SR	1.00	FR	
										29.0	J	20	S	1.00	FR	
-4			6							29.2	J	20	SR	5.00	FR	

McMILLEN JACOBS ASSOCIATES

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-6A

Date(s) Drilled:	09/18/2019 - 09/18/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.4 ft / NGVD 1929		
Location:	On Roosevelt Ave Ext. north of Jenks Way	Coordinates:	359521.28E,288557.54N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		26-31	5	3	C-1	59/ 98%	34/ 57%		Strong, fresh, gray, fine-grained SILTSTONE	30.1	J	50	SR	5.00	FR	
										30.2	J	30	S	1.00	FR	
										30.6	J	30	SR	1.00	FR	
										30.7	J	40	SR	5.00	FR	
									Bottom of borehole at 31.0 ft.							
-9																
	35															
-14																

McMILLEN JACOBS ASSOCIATES

Boring B-6A

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-7

Date(s) Drilled	08/30/2019 - 08/30/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	29.2 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	23.3 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. across from National Grid Property	Coordinates	359529.70E,288817.39N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									(ASPHALT)	
			0.5-2	S-1	11/18	5-11-17 (N=28)	SP-SM		Moist, medium dense, light brown/red, coarse to fine SAND, some gravel, trace silt (FILL)	PID=0
			2-4	S-2	16/24	11-11-7-6 (N=18)	SP-SM		Moist, medium dense, black, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
19	▽	5	4-6	S-3	4/24	4-2-3-2 (N=5)	SP-SM		Wet, loose, black, medium to fine SAND, little gravel, trace silt (FILL)	
			6-8	S-4	6/24	1-2-1-0 (N=3)	GW		Wet, very loose, black, coarse to fine GRAVEL, little sand (FILL)	PID=0
14			8-10	S-5	8/24	1-1-18-6 (N=19)	GW-GM		Wet, medium dense, black, coarse to fine GRAVEL, trace sand and silt (FILL)	PID=0
		10	10-12	S-6	15/24	10-47-34-18 (N=81)	GW		Wet, very dense, dark brown decomposed wood. Bottom 3": Gray coarse to fine GRAVEL, some silt, little sand (FILL)	3 in split spoon sample. PID=0
9		15	14-16	S-7	13/24	8-9-24-36 (N=33)	SM		Wet, dense, light brown, medium to fine SAND, some gravel, little silt (GLACIOFLUVIAL)	PID=0 Rig Chatter
4			19-20.8	S-8	15/22	21-35-52-50/4" (N=87)			Wet, very dense, light brown, medium to fine SAND, little gravel, trace silt (GLACIOFLUVIAL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-7

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-7

Date(s) Drilled	08/30/2019 - 08/30/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	29.2 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	23.3 ft / NGVD 1929		
Location	On Roosevelt Ave Ext. across from National Grid Property	Coordinates	359529.70E,288817.39N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
					SP		Wet, very dense, light brown, medium to fine SAND, little gravel, trace silt (GLACIOFLUVIAL)	PID=0
-1	24-24.08	S-9	1/1	80/1"				
25					SC		Wet, very dense, gray, fine SAND and clay, some fractured rock (GLACIAL TILL)	Rig Chatter
	29-29.13	S-10	0/2	50/2"				
-6							Bottom of borehole at 29.2 ft.	
30								
-11								
35								
-16								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-7

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-8

Date(s) Drilled	09/10/2019 - 09/10/2019	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	S. Wilbur	Checked By	W. Kilker
Drilling Method/ Rig Type	Mud Rotary/CME 45	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	25.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Automatic	Ground Surface Elevation/Datum	31.1 ft / NGVD 1929		
Location	Intersection of Roosevelt Ave. Ext. and Main St.	Coordinates	359697.13E,289110.39N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
27		5								
			6-8	S-1	6/24	14-8-5-8 (N=13)	SM		Moist, stiff, brown, SAND, some silt, little gravel (FILL)	PID=0
22			8-10	S-2	9/24	7-4-4-5 (N=8)	SP		Wet, loose, brown, coarse to fine SAND, little gravel, trace silt (GLACIOFLUVIAL)	PID=0
	▽	10	10-12	S-3	7/24	6-5-2-1 (N=7)	SM		Wet, loose, brown, SAND, some silt, little gravel (GLACIOFLUVIAL)	PID=0
17			~~14-14.08~~	~~S-4~~	~~1/1~~	~~50/1"~~				No casing advancement
		15					GW		Wet, very dense, gray, coarse to fine GRAVEL, trace silt (GLACIAL TILL)	
										Sampler refusal at 14.1 ft. Rollerbit from 14.1 ft to 16 ft.
12									See Core Boring Report for rock details	

▽ - Water Level at Time of Drilling

Boring B-8

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-8

Date(s) Drilled:	09/10/2019 - 09/10/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	25.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	31.1 ft / NGVD 1929		
Location:	Intersection of Roosevelt Ave. Ext. and Main St.	Coordinates:	359697.13E,289110.39N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
17	15								See Test Boring Report for Overburden Details
12		16-21	3 3 2 2	3	C-1	58/ 97%	16/ 27%		Strong, fresh, gray, medium-grained SANDSTONE

DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
16.3	J	30	SR	5.00	FR	
16.4	J	30	SR	10.0	FR	
16.5	J	30	S	0	FR	
16.8	J	40	R	1.00	FR	
16.8	J	20	SR	10.0	FR	
16.9	J	50	SR	0	FR	
17.2	J	30	SR	10.0	FR	FE
17.3	J	30	SR	0	FR	FE
17.6	J	40	SR	5.00	FR	FE
17.7	J	40	R	5.00	FR	FE
17.8	J	40	SR	5.00	FR	
17.9	J	40	SR	10.0	FR	
18.0	J	50	R	0	FR	FE
18.7	J	50	SR	10.0	FR	FE
19.0	J	40	SR	0	FR	
19.2	J	30	SR	5.00	FR	
19.3	J	40	SR	5.00	FR	
19.4	J	50	SR		FR	
19.5						

McMILLEN JACOBS ASSOCIATES

Boring B-8

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-8

Date(s) Drilled:	09/10/2019 - 09/10/2019	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	S. Wilbur	Checked By:	W. Kilker
Drilling Method/ Rig Type:	Mud Rotary/CME 45	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	25.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	31.1 ft / NGVD 1929		
Location:	Intersection of Roosevelt Ave. Ext. and Main St.	Coordinates:	359697.13E,289110.39N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
		16-21	2	3	C-1	58/ 97%	16/ 27%		Strong, fresh, gray, medium-grained SANDSTONE
		21-25	3	3	C-2	42/ 88%	11/ 23%		Strong, fresh, gray, medium-grained SANDSTONE with conglomeratic material between 21-22.2 ft
			2						
			8						
7			1						
	25								Bottom of borehole at 25.0 ft.
2									

DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
19.8	J	20	SR	10.0	FR	
20.0	J	30	SR	0	FR	
	J	30	SR	5.00	FR	
20.6	J	10	SR	5.00	FR	
20.7	J	30	SR	1.00	FR	
21.1	J	10	SR	5.00	FR	
21.2	J	50	SR	10.0	FR	
21.5	J	40	SR	0	FR	
21.6	J	40	SR	10.0	FR	
21.7	J	50	S	0	FR	
21.9	J	40	SR	10.0	FR	
22.2	J	40	SR	0	FR	
				5.00		
				5.00		
				5.00		
				5.00		
				5.00		
				5.00		
23.7	J	30	R	5.00	SL	
				1.00		
24.0	J	30	SR	5.00	FR	
				1.00		
				5.00		
				1.00		

McMILLEN JACOBS ASSOCIATES

Boring B-8

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-9

Date(s) Drilled	02/10/2020 - 02/10/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	39.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	28.0 ft / NGVD 1929		
Location	Across Taft St. from charter school on Tidewater Site	Coordinates	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
24		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	6/24	7-16-19-19 (N=35)	SP		Moist, dense, brown, fine SAND little gravel, trace silt (FILL)	PID=0
19		10	8-10	S-2	20/24	13-16-13-9 (N=29)	SP		Top 7": Moist, brown, SAND, some gravel (FILL)	PID=0
							ML		Bottom 13": Moist, very stiff, light brown, SILT, trace sand (ALLUVIUM)	
14		15	14-16	S-3	6/24	15-11-5-5 (N=16)	ML		Moist, very stiff, brown, SILT, trace sand (ALLUVIUM)	PID=0
	▽		17-19	S-4	20/24	6-3-2-3 (N=5)	ML		Wet, medium stiff, dark gray, clayey SILT (ALLUVIUM)	PID=0
9									Wet, medium stiff, dark gray, clayey SILT (ALLUVIUM)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-9

Date(s) Drilled	02/10/2020 - 02/10/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	39.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	28.0 ft / NGVD 1929		
Location	Across Taft St. from charter school on Tidewater Site	Coordinates	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	19-21	S-5	19/24	5-1-6-23 (N=7)	ML		Wet, medium stiff, dark gray, clayey SILT (ALLUVIUM)	PID=0
	21-23	S-6	16/24	19-28-19-26 (N=47)	SW		Moist, dense, orange brown, coarse to medium SAND, little gravel (GLACIAL TILL)	PID=0
-4	23-25	S-7	16/24	42-38-50- 58 (N=88)	GM		Moist, very dense, gray, coarse to fine GRAVEL, some clayey silt, little sand (GLACIAL TILL)	PID=0
25	25-27	S-8	16/24	62-44-37-52 (N=81)	SM		Moist, very dense, gray, medium to fine SAND and coarse to fine GRAVEL, little silt (GLACIAL TILL)	PID=0
	27-28.75	S-9	17/21	38-30-32-100/3" (N=62)	SM		Moist, very dense, gray, medium to fine SAND and coarse to fine GRAVEL, little clayey silt (GLACIAL TILL)	PID=0. Rock fragments in tip of sampler.
-1								
30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-6								
35								
-11								

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-9

Date(s) Drilled:	02/10/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	28.0 ft / NGVD 1929		
Location:	Across Taft St. from charter school on Tidewater Site	Coordinates:	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
4																
	25															
									See Test Boring Report for Overburden Details							
-1		29-34	6	5	C-1	58/ 97%	41/ 68%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-9

Date(s) Drilled:	02/10/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	28.0 ft / NGVD 1929		
Location:	Across Taft St. from charter school on Tidewater Site	Coordinates:	359657.08E,286344.74N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
		29-34	4, 3, 2, 2	5	C-1	58/ 97%	41/ 68%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE
-6	35	34-39	3, 2, 2, 2, 4	5	C-2	60/ 100%	39/ 65%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE
-11									Bottom of borehole at 39.0 ft.

DISCONTINUITIES

DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
30.9	HJ	30				
31.4	J	35	SR	0.50	SW	SL
31.8	J	30	SM	0.50	SW	
32.0	HJ	40				
32.3	J	40	SM	1.00	SW	SL
32.3	J	30	SM	0.50	SW	SL
32.5	J	30	SM	0.50	SW	
32.7	J	30	SM	0.50	SW	
32.8	J	30	SM	0.50	SW	SL
32.9	J	30		0.50	SW	
33.2	J	30	SR	0.50	SW	
33.3	HJ	30	SM	0.50	SW	
33.6	J	30				
33.7	HJ	30				
33.8	J	25				
34.1	HJ	40	SM	0.50	SW	SL
34.3	HJ	70				
34.5	J	35				
34.6	HJ	20	SR	0.50	SW	
34.8	HJ	45				
35.1	J	50				
36.0	J	40	SR	0.50	SW	SL
36.8	J	45	SR	0.50	SW	SL
37.0	J	40	SR	0.50	SW	
37.2	J	35	SL	0.50	SW	
37.7	J	65	SL	0.50	SW	
37.8	J	35	SL	0.50	SW	CS
38.0	F/S	40	SL	5.00	MW	
38.4	J	40	SM	0.50	SW	SL
38.5	J	40	SM	0.50	SW	SL
38.6	J	40	SM	0.50	SW	SL
38.7	J	40	SM	0.50	SW	SL
38.8	J	35	SR	0.50	SW	

McMILLEN JACOBS ASSOCIATES

Boring B-9

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-10

Date(s) Drilled	02/05/2020 - 02/05/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	23.7 ft / NGVD 1929		
Location	Southerly end of field on Tidewater Site	Coordinates	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
19		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	11/24	17-16-18-20 (N=34)	SP		Moist, dense, brown, medium SAND, trace gravel (FILL)	PID=0
			8-10	S-2	21/24	17-15-17-17 (N=32)	SP		Moist, dense, brown, medium SAND (FILL)	PID=0
14		10	10-12	S-3	9/24	15-10-12-16 (N=22)	SP		Moist, medium dense, dark brown, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
			12-14	S-4	20/24	14-12-19-18 (N=31)	SP		Moist, dense, dark brown, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
9		15	14-16	S-5	9/24	19-13-14-10 (N=27)	SP		Moist, medium dense, dark brown, medium to fine SAND, little gravel, trace silt (FILL)	PID=0
			16-18	S-6	4/24	11-10-12-11 (N=22)	SP		Moist, medium dense, dark brown, medium SAND, trace gravel and silt. Fragments of brick. (FILL)	PID=0. Rock fragments in tip of sampler.
4			18-20	S-7	12/24	19-23-30-46 (N=53)	SP		Moist, very dense, brown, coarse to fine SAND, some gravel, trace silt (FILL)	PID=0

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-10

Date(s) Drilled	02/05/2020 - 02/05/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	31.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	23.7 ft / NGVD 1929		
Location	Southerly end of field on Tidewater Site	Coordinates	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	▽		20-21	S-8	9/12	73-103 (Refusal)	GM		Wet, very dense, dark gray, coarse to fine GRAVEL, little sand and silt (GLACIAL TILL)	PID=3. Petroleum odor, oily appearance, rock fragments in tip of sampler.
									Top of Bedrock at 21.0 ft. See Core Boring Report for rock details.	
-1		25								
-6		30								
-11		35								
-16										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-10

Date(s) Drilled:	02/05/2020 - 02/05/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	23.7 ft / NGVD 1929		
Location:	Southerly end of field on Tidewater Site	Coordinates:	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
									See Test Boring Report for Overburden Details							
		21-26	3	4	C-1	56/ 93%	37/ 62%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE	21.3	J	65	SM	1.00	FR	
										21.7	J	30	R	1.00	SW	SI
			3							22.2	J	25	R		SW	
										22.8	J	45	SM		SW	
			4							23.2	J	60	VR	1.00	SW	PY
										23.4	J	35	R	0.50	SW	
										23.7	J	35	R	0.25	SW	
										23.9	J	40	R	2.00	SW	
			5							24.4	J	40	R	1.00	SW	
-1										24.7	J	40	R	0.50	SW	
	25									24.9	J	45	R	2.00	SW	
			10							25.2	J	20	VR	2.00	SW	
										25.4	J	35	R		SW	
		26-31	2	4	C-2	60/ 100%	52/ 87%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE							
			3							27.2	J	50	SR	1.00	SW	CA
										27.6	HJ	70	SR	2.00	SW	
										27.7	J	40			SW	
			3							28.9	J	45	SR	1.00	SW	SI
										29.0	J	50	SR	0.25	SW	
			2							29.1	J	40	SM	1.00	SW	
										29.4	J	45	SM	1.00	SW	
-6										29.8	J	35	SM	1.00	SW	

McMILLEN JACOBS ASSOCIATES

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-10

Date(s) Drilled:	02/05/2020 - 02/05/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	31.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	23.7 ft / NGVD 1929		
Location:	Southerly end of field on Tidewater Site	Coordinates:	359996.52E,286103.11N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		26-31	3	4	C-2	60/ 100%	52/ 87%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE	30.0	J	35	SM	0.50	SW	
										30.5	J	25	SM	0.25	SW	
										30.7	J	40	SM	0.25	SW	
									Bottom of borehole at 31.0 ft.							
-11	35															
-16																

McMILLEN JACOBS ASSOCIATES

Boring B-10

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-11

Date(s) Drilled: 02/07/2020 - 02/10/2020	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: M. MacInnis	Checked By: J. Freitas
Drilling Method/ Rig Type: Mud Rotary/Acker Scout	Drilling Contractor: Geologic Earth Exploration, Inc.	Total Depth of Borehole: 39.0 ft	
Borehole Diameter/ Sampler Diameter: 4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum: 25.7 ft / NGVD 1929	
Location: Tidewater Site	Coordinates: 359825.47E,286216.96N	Elevation Source: Field Survey	

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 1 ft: Encountered existing concrete tank foundation (1ft thick from 1-2ft below grade) (FILL)	
			2-4	S-1	24/24	20-23-42-21 (N=65)	SW		Moist, very dense, brown, medium to fine SAND, some gravel (FILL)	PID=0
21		5	4-6	S-2	12/24	20-22-56-36 (N=78)	SW		Moist, very dense, brown, medium to coarse SAND and gravel, trace silt (FILL)	Rig Chatter. PID=0
16		10	9-11	S-3	14/24	14-9-13-10 (N=22)	ML		Moist, very stiff, light brown SILT, trace fine sand, trace clay (ALLUVIUM)	PID=0
			13-15	S-4	17/24	7-3-8-8 (N=11)	ML		Moist, stiff, light brown, clayey SILT, trace sand (ALLUVIUM)	PID=0
11		15	15-17	S-5	7/24	19-22-16-16 (N=38)	GM		Moist, dense, brown, coarse to fine GRAVEL, some coarse to fine sand, little silt (GLACIOFLUVIAL)	PID=0
	▽		17-19	S-6	12/24	15-10-10-12 (N=20)	GM		Moist, medium dense, brown, coarse to fine GRAVEL, some sand, little silt (GLACIOFLUVIAL)	PID=0
6										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-11

Date(s) Drilled	02/07/2020 - 02/10/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	39.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	25.7 ft / NGVD 1929		
Location	Tidewater Site	Coordinates	359825.47E,286216.96N	Elevation Source	Field Survey		

ELEV. (ft) / WATER LEVEL / DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	19-21	S-7	10/24	14-15-9-10 (N=24)	SP-SM		Moist, medium dense, light brown, coarse to medium SAND, some gravel, trace silt (GLACIOFLUVIAL)	Rig Chatter. PID=0
	21-23	S-8	16/24	9-6-14-20 (N=20)	ML		Moist, very stiff, dark gray, clayey SILT, some sand (GLACIOFLUVIAL)	PID=0. Rock fragments in tip of sampler
	23-25	S-9	8/24	24-22-26-24 (N=48)	GM		Moist, dense, gray, coarse to fine GRAVEL, some sand, little clayey silt (GLACIAL TILL)	PID=0
-1 25	25-27	S-10	15/24	26-48-18-52 (N=66)	GM		Moist, very dense, gray, coarse to fine GRAVEL, some sand, little clayey silt (GLACIAL TILL)	PID=0. Rock fragments in tip of sampler
-4 30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-9 35								
-14							Bottom of borehole at 39.0 ft.	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-11

Date(s) Drilled:	02/07/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.7 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359825.47E,286216.96N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
1	25								See Test Boring Report for Overburden Details							
-4		29-33	2	4	C-1	25/ 52%	5/ 10%		Strong, moderately to completely weathered, dark gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-11

Date(s) Drilled:	02/07/2020 - 02/10/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	39.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	25.7 ft / NGVD 1929		
Location:	Tidewater Site	Coordinates:	359825.47E,286216.96N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION
		29-33	1, 1, 2	4	C-1	25/ 52%	5/ 10%		Strong, moderately to completely weathered, dark gray, medium-grained SANDSTONE
									Split spoon sample attempted at 34 ft. with blow count of 50/0"
-9	35	34-39	3, 3, 4, 4, 4	4	C-2	52/ 87%	41/ 68%		Strong, slightly weathered, gray, medium-grained SANDSTONE
-14									Bottom of borehole at 39.0 ft.

DISCONTINUITIES

DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
30.5	J	45	R		MW	FE
30.8	J	30	R		MW	FE
31.0	J	15	R	1.00	SW	
31.2	J	50	VR		MW	FE
31.5	J	40	SR		MW	FE
34.1	J	45	SR	1.00	SW	SI
34.9	J	45	SM	1.00	SW	
35.2	J	45	SR	2.00	SW	SI
35.4	J	35	VR	2.00	SW	SI
35.5	J	40	SR	0.50	SW	SI
35.7	J	50	VR	0.50	SW	SI
36.2	J	45	SR	1.00	SW	
37.0	J	40	SR	1.00	SW	
37.3	J	50	VR	1.00	SW	
37.7	J	55	SR	0.50	SW	
38.0	J	40	SR	0.50	SW	

McMILLEN JACOBS ASSOCIATES

Boring B-11

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-12

Date(s) Drilled	02/11/2020 - 02/12/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	51.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	30.1 ft / NGVD 1929		
Location	Across Taft St. from Tower St. on Tidewater Site	Coordinates	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
26		5							Vacuum excavated from about 0 to 6 ft (FILL)	
			6-8	S-1	14/24	12-17-14-18 (N=31)	ML		Moist, hard, light brown SILT, little clay (ALLUVIUM)	PID=0
21		10	8-10	S-2	19/24	13-8-12-14 (N=20)	ML		Moist, very stiff, dark gray, clayey SILT (ALLUVIUM)	PID=0
16		15	14-16	S-3	11/24	4-8-7-7 (N=15)	ML		Moist, stiff, dark gray, clayey SILT (ALLUVIUM)	PID=0
11							ML		Moist, gray SILT (ALLUVIUM)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-12

Date(s) Drilled	02/11/2020 - 02/12/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	51.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	30.1 ft / NGVD 1929		
Location	Across Taft St. from Tower St. on Tidewater Site	Coordinates	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
	▽		19-21	S-4	16/24	9-15-18-21 (N=33)	SP		Moist, dense, brown, fine to medium SAND, trace silt (ALLUVIUM)	PID=0
6			23-25	S-5	12/24	24-14-16-20 (N=30)	CL		Moist, hard, light brown CLAY, little silt (GLACIAL TILL)	PID=0
		25	25-27	S-6	16/24	34-64-65-54 (N=129)	GC		Moist, very dense, brown, clayey GRAVEL, little sand and silt (GLACIAL TILL)	Sampler would not open. PID=0.
			27-28.75	S-7	4/21	34-69-48-100/3" (N=117)	GC		Moist, very dense, brown, clayey GRAVEL, little sand (GLACIAL TILL)	PID=0. Rock fragments lodged in tip of sampler.
1		30							Top of Bedrock at 29.0 ft. See Core Boring Report for rock details.	
-4		35								
-9										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
6																
	25															
									See Test Boring Report for Overburden Details							
1		29-34	3		C-1	9/ 15%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		29-34	3, 4, 1, 1		C-1	9/ 15%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							
-4	35	34-37	2, 1, 6		C-2	13/ 36%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							
-9		37-41	4		C-3	6/ 12%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DISCONTINUITIES DEPTH (FT)	TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		37-41			C-3	6/ 12%	0/ 0%		Weak, highly weathered, gray, medium-grained SANDSTONE							
		41-46	2	5	C-4	59/ 98%	53/ 88%		Strong, slightly weathered, dark gray, medium-grained SANDSTONE	41.4	J	35	SR	0.50	SW	SI
			3							42.0	J	30	SM	0.50	SW	
										42.8	J	30	SM	0.50	SW	
			2							43.6	J	20	SR	2.00	SW	SI
-14										44.2	F/S	30	SL	5.00	MW	CS
			2													
	45									45.0	J	25	SM	0.50	SW	
			2							45.4	J	35	SM	0.50	SW	
										45.5	J			0.50	SW	
		46-51	2	5	C-5	59/ 98%	46/ 77%		Strong, slightly weathered, purple, medium-grained SANDSTONE	46.1	J	35	SL	0.50	SW	PY
										46.2	J	30	SL	0.50	SW	
										46.4	J	25	SR	0.50	SW	
			2							47.2	J	40	SR	0.50	SW	
										47.3	J	40	SM	0.50	SW	
										47.7	J	40	SM	0.50	SW	SL
			2													
-19																
			2							49.4	HJ	20	SM	0.50	SW	
										49.4	J	30	SR	0.50	SW	
										49.6	J	40		0.50		

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Core Boring B-12

Date(s) Drilled:	02/11/2020 - 02/12/2020	Geotechnical Consultant:	McMillen Jacobs Associates	Logged By:	M. MacInnis	Checked By:	J. Freitas
Drilling Method/ Rig Type:	Mud Rotary/Acker Scout	Drilling Contractor:	Geologic Earth Exploration, Inc.	Total Depth of Borehole:	51.0 ft		
Borehole Diameter:	4.00 in	Core Barrel Type / Size:	NX / 2 in	Ground Surface Elevation/Datum:	30.1 ft / NGVD 1929		
Location:	Across Taft St. from Tower St. on Tidewater Site	Coordinates:	359643.34E,286494.92N	Elevation Source	Field Survey		

ELEV. (FT)	DEPTH (FT)	SAMPLE DEPTH (ft)	DRILL RATE (FT/MIN)	BOX #	RUN #	RECOVERY (in/%)	RQD (in/%)	ROCK TYPE	MATERIAL DESCRIPTION	DEPTH (FT)	DISCONTINUITIES TYPE	DIP	RGH	APT (mm)	WEATHERING	INFILL
		46-51	2	5	C-5	59/ 98%	46/ 77%		Strong, slightly weathered, purple, medium-grained SANDSTONE	50.2 50.2 50.6	HJ J J	35 35 35	SM SR	0.50 0.50 0.50	SW SW	SL
									Bottom of borehole at 51.0 ft.							
-24																
	55															
-29																

McMILLEN JACOBS ASSOCIATES

Boring B-12

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-13

Date(s) Drilled	02/06/2020 - 02/06/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	21.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	9.7 ft / NGVD 1929		
Location	Across Seekonk River from Festival Pier on Tidewater Site	Coordinates	360398.12E,286078.13N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
									Vacuum excavated from about 0 to 6 ft (FILL)	
5		5								
			6-8	S-1	3/24	75-86-54-12 (N=140)	GW		Moist, very dense, dark gray, coarse to fine GRAVEL, some sand, trace silt (FILL)	PID=0
			8-10	S-2	20/24	2-5-6-2 (N=11)	SM		Moist, medium dense, dark gray, medium to fine SAND, little silt grading to coarse to fine GRAVEL, little silt. Fragments of brick. (FILL)	PID=0. Strong petroleum odor, oily sheen.
0		10								
			10-12	S-4	1/24	7-4-5-6 (N=9)	GM		Moist, medium dense, dark gray, sandy GRAVEL, little silt (FILL)	PID=2
										Rig Chatter
	▽									
-5		15	14-16	S-5	13/24	30-16-17-26 (N=33)	GW		Wet, dense, dark gray, coarse to fine sandy GRAVEL, trace silt (FILL)	PID=0. Rock fragments in tip of sampler, strong petroleum odor.
										PID>100. Very strong petroleum odor, oily sheen.
-10									Wet, hard, grey/brown clayey SILT, trace fine sand (FILL)	

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-13

Project: NBC CSO Phase III A-4 and III A-5 Consolidation Conduits
Project Location: Pawtucket, RI
Project Number: 5980.0

Boring B-13

Date(s) Drilled	02/06/2020 - 02/06/2020	Geotechnical Consultant	McMillen Jacobs Associates	Logged By	M. MacInnis	Checked By	J. Freitas
Drilling Method/ Rig Type	Mud Rotary/Acker Scout	Drilling Contractor	Geologic Earth Exploration, Inc.	Total Depth of Borehole	21.0 ft		
Borehole Diameter/ Sampler Diameter	4.00 in I.D. / 2 & 3 in I.D.	Hammer Weight/Drop (lb/in.)/Type	140 lb / 30 in / Doughnut	Ground Surface Elevation/Datum	9.7 ft / NGVD 1929		
Location	Across Seekonk River from Festival Pier on Tidewater Site	Coordinates	360398.12E,286078.13N	Elevation Source	Field Survey		

ELEV. (ft)	WATER LEVEL	DEPTH (ft)	SAMPLE DEPTH (ft)	SAMPLE NUMBER	REC (in)/ PEN (in)	BLOW COUNTS	USCS	USCS GRAPHIC	MATERIAL DESCRIPTION	REMARKS AND TESTS
			19-21	S-6	11/24	19-19-23-18 (N=42)	ML		Wet, hard, grey/brown clayey SILT, trace fine sand (FILL)	
									Bottom of borehole at 21.0 ft.	
-15		25								
-20		30								
-25		35								
-30										

McMILLEN JACOBS ASSOCIATES

▽ - Water Level at Time of Drilling

Boring B-13

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-2

Boring No. B-2

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/4/2019-9/5/2019
DRILLER	Paul Fisher	**WATER LEVEL**	8.60

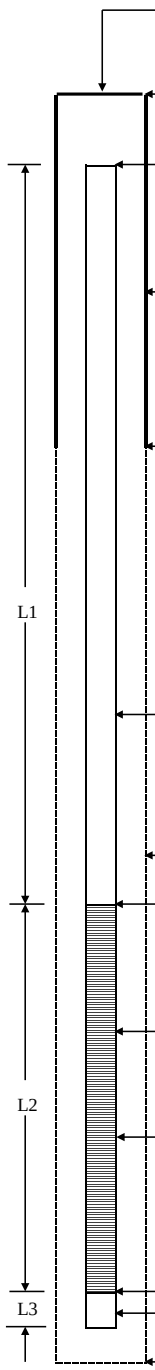
Ground El. 22.22 ft
El. Datum NVGD 29

Location Middle of the field on Tidewater Site

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-14': Fill - Brown and gray, sands, silts, and gravel	0-2': Grout
	2-3': Bentonite Seal
14-20': Alluvium - Brown silty sands and silt	3-15': Holliston Sand
24-29': Till - Sands, silts and gravels.	15-34': Grout
29-34': Rock	

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.5	ft
Height of top of riser pipe above the ground surface	2	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Grout	0.0	2.0
Bentonite	2.0	1.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	5.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	15.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	34.0	ft

ft	+	ft	+	ft	=	ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	Boring No.
B-02	B-02

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/4/2019-9/5/2019

ELEVATION OF REFERENCE POINT 22.2 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
9/9/2019	7:00am	4	11.1	11.1		SW
2/4/2020	12:00pm	152	5	17.2		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-3

Boring No. B-3

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/9/2019
DRILLER	Ray Eastwood	**WATER LEVEL**	

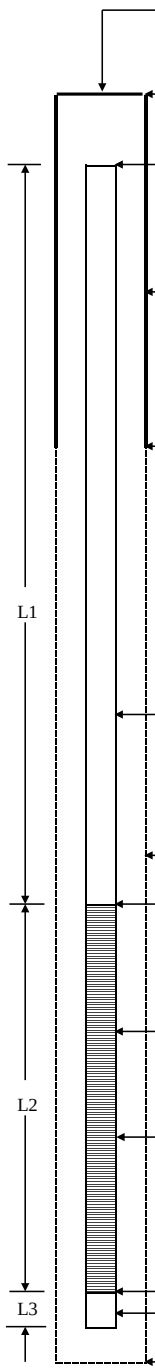
Ground El. 37.45 ft
El. Datum NVGD 29

Location Northwestern corner of the Tideawter Site

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-14': Fill - Brown, silty sands with gravel	
14-23': Tan, sands with silt and gravel	0-12.5': Grout and Drill Cuttings
	12.5-14.5': Bentonite Seal
23-27': Till - Brown, sands, silts, clays and gravel	
27-37': Rock	14.5-26.5': Holliston Sand
	26.5-37': Bentonite Chips

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.5	ft
Height of top of riser pipe above the ground surface	2	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Grout	0.0	12.5
Bentonite	12.5	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	16.5	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	26.5	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	37.0	ft

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft	+	ft	+	ft	=	ft

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	Boring No.
B-03	B-03

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	9/9/2019

ELEVATION OF REFERENCE POINT 37.45 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
-	-	-	-	-	No groundwater monitoring to date due to access constraints at the Tidewater site.	-
-	-	-	-	-		-
-	-	-	-	-		-
-	-	-	-	-		-

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-4C

Boring No. B-4C

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/29/2019
DRILLER	Paul Fisher	**WATER LEVEL**	18.50

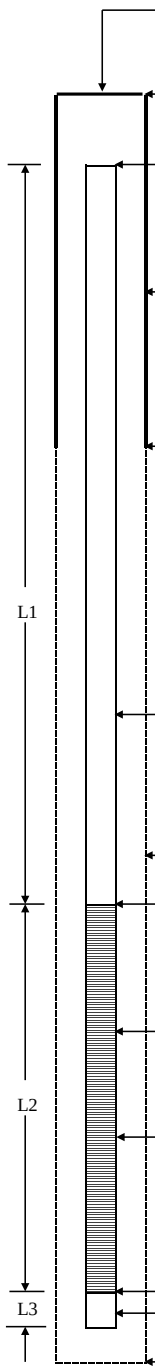
Ground El. 19.87 ft
El. Datum NVGD 29

Location East side of Roosevelt, across from southern property extents of Masonic Temple

☐ **Guard Pipe**
☑ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-20': Fill - Light brown, sands with silt and gravel	0-10': Drill Cuttings
20-24': Glaciofluvial - Red silty sand	10-12': Bentonite Seal
24-29.5': Till - Gray, sands, silts and gravels	14-24': Holliston Sand
29.5 -34': Rock	24-34': Drill Cuttings

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Roadway Box Cover	
Depth of roadway box below the ground surface	0.0	ft
Depth of top of riser pipe below the ground surface	0.5	ft
Type of protective casing:	Roadway Box	
Length	0.5	ft
Inside Diameter	6	in
Depth of bottom of guard pipe/roadway box	0.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Drill Cuttings	0.0	10.0
Bentonite	10.0	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	14.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	24.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	35.0	ft

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft		ft		ft		ft

COMMENTS:

GROUNDWATER MONITORING REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-4C

Boring No. B-4C

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/29/2019

ELEVATION OF REFERENCE POINT 19.87 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
9/12/2019	7:10am	14	18.3	1.57		SW
9/18/2019	7:10am	20	18.5	1.37		SW
2/12/2020	3:00pm	167	18.5	1.37		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-7

Boring No. B-7

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/30/2019
DRILLER	Paul Fisher	**WATER LEVEL**	8.40

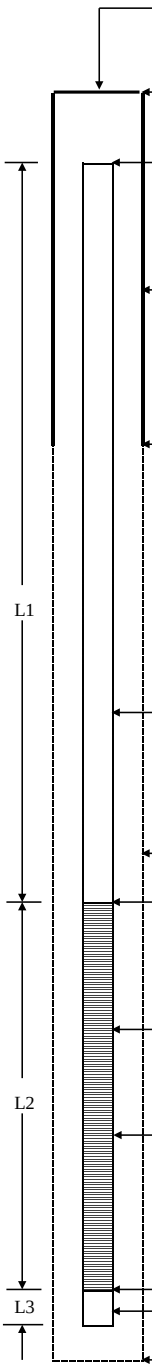
Ground El. 23.28 ft
El. Datum NVGD 29

Location West side Roosevelt Ave, across from National Grid Hydroelectric facility.

☐ **Guard Pipe**
☑ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-14': Fill - brown and black, sand with silt; and gravel with silt	0-6': Drill Cuttings
	6-8': Bentonite Seal
14-24': Glaciofluvial - Brown, silty sand with gravel	8-20': Holliston Sand
24-29.2': Till - Gray, sands, clays, and gravel	20-29.2': Drill Cuttings

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)



(Not to Scale)

Type of protective cover/lock	Roadway Box Cover	
Depth of roadway box below the ground surface	0.0	ft
Depth of top of riser pipe below the ground surface	0.3	ft
Type of protective casing:	Roadway Box	
Length	0.5	ft
Inside Diameter	6.0	in
Depth of bottom of guard pipe/roadway box	0.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Drill Cuttings	0.0	6.0
Bentonite Seal	6.0	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holliston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	10.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	20.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	29.2	ft

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft		ft		ft		ft

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No. B-07

Boring No. B-07

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	S. Wilbur
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	8/30/2019

ELEVATION OF REFERENCE POINT 23.28 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
9/12/2019	7:00am	13	8.4	14.88		SW
9/18/2019	7:00am	19	8.5	14.78		SW
2/10/2020	7:00am	164	8.25	15.03		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-9 (OW)
Boring No. B-9

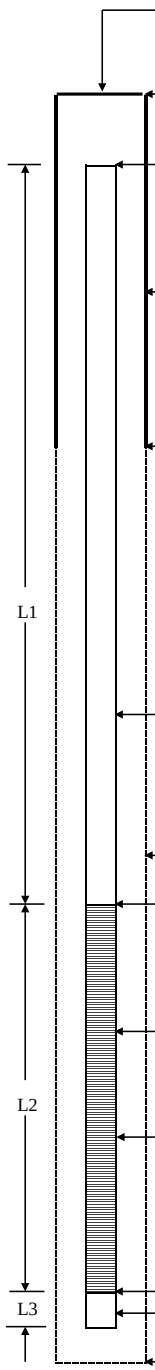
PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/10/2020
DRILLER	John Boyd	**WATER LEVEL**	10.67'

Ground El. 28.04 ft
El. Datum NVGD 29

Location Across Taft St. from charter school on Tidewater Site.

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-9': Fill - Brown sands and gravels	0-5': Drill Cuttings
	5-8': Bentonite Seal
9-20': Alluvium - Brown and gray silts and clays	8-20': Holliston Sand



Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.5	ft
Height of top of riser pipe above the ground surface	2	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.5	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	5.0	3.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holiston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	10.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holiston Sand	
Depth of bottom of well screen	20.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	20.0	ft

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)

(Not to Scale)

ft +	ft +	ft =	ft
Riser Pay Length (L1)	Length of screen (L2)	Length of silt trap (L3)	Pay length

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	B-09 (OW)
Boring No.	B-09

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/10/2020

ELEVATION OF REFERENCE POINT 28.04 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
2/10/2020	12:00pm	0	10.66	17.38		MM

OBSERVATION WELL INSTALLATION REPORT

McMILLEN JACOBS ASSOCIATES

Well No. B-10 (OW)
Boring No. B-10

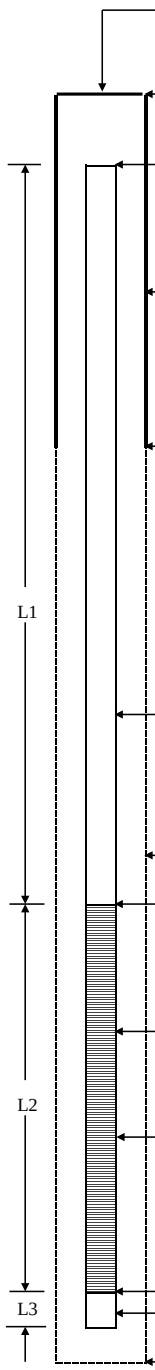
PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**FILE NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/6/2020
DRILLER	Dave Sheldon	**WATER LEVEL**	10.42'

Ground El. 23.74 ft
El. Datum NVGD 29

Location Southerly end of field on Tidewater Site.

☑ **Guard Pipe**
☐ **Roadway Box**

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0-16': Fill - Brown sand and gravels	0-2': Drill Cuttings
	2-4': Bentonite Seal
	4-16': Holliston Sand



Type of protective cover/lock	Guard Pipe with Lock	
Height of top of guard pipe above the ground surface	2.75	ft
Height of top of riser pipe above the ground surface	2.25	ft
Type of protective casing:	Guard Pipe	
Length	5.0	ft
Inside Diameter	4.0	in
Depth of bottom of guard pipe/roadway box	2.2	ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite Seal	2.0	2.0

Type of riser pipe:	Solid PVC	
Inside diameter of riser pipe	2.0	in
Type of backfill around riser	Holiston Sand	
Diameter of borehole	4.0	in
Depth to top of well screen	6.0	ft
Type of screen	Slotted PVC Schedule 40	
Screen gauge or size of openings	0.01	in
Diameter of screen	2.0	in
Type of backfill around screen	Holliston Sand	
Depth of bottom of well screen	16.0	ft
Bottom of Silt trap	-	ft
Depth of bottom of borehole	16.0	ft

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)

(Not to Scale)

Riser Pay Length (L1)	+	Length of screen (L2)	+	Length of silt trap (L3)	=	Pay length
ft	+	ft	+	ft	=	ft

COMMENTS:

GROUNDWATER MONITORING REPORT

Well No.	B-10 (OW)
Boring No.	B-10 (OW)

PROJECT	NBC Phase III Consolidation Conduits IIIA-4 and IIIA-5	**MJA JOB NO.**	5980
LOCATION	Pawtucket, RI	**PROJECT MGR.**	T. Muindi
CLIENT	NBC	**FIELD REP.**	M. MacInnis
CONTRACTOR	Geologic Earth Exploration, Inc.	**DATE INSTALLED**	2/6/2020

ELEVATION OF REFERENCE POINT 23.74 NGVD 29 **REFERENCE POINT:** **Ground Surface** ☑ **PVC** ☐ **Other**

Date	Time	Elapsed Time (Days)	Depth of Water from Reference Point (ft)	Elevation of Water (ft)	Remarks	Read By
2/10/2020	12:15pm	4	10.42	13.32		MM

APPENDIX F

SOIL LABORATORY CERTIFICATES OF ANALYSIS

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (N/A)
ESS Laboratory Work Order Number: 19H0859

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:49 pm, Sep 05, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

SAMPLE RECEIPT

The following samples were received on August 27, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 8/27/19 at 15:52.

Lab Number	Sample Name	Matrix	Analysis
19H0859-01	B-5 0-2ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0859-02	B-5 2-4ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0859-03	B-5 4-6ft	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0859-04	B-5 6-10ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

CH92823-BS1 **Blank Spike recovery is below lower control limit (B-).**
Dichlorodifluoromethane (63% @ 70-130%)

CH92823-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Dichlorodifluoromethane (60% @ 70-130%)

CH92957-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Dichlorodifluoromethane (68% @ 70-130%)

8100M Total Petroleum Hydrocarbons

19H0859-02 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

8270D Semi-Volatile Organic Compounds

C9H0589-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (101% @ 80-120%), 4,6-Dinitro-2-Methylphenol (109% @ 80-120%), Benzoic Acid (102% @ 80-120%), Pentachlorophenol (117% @ 80-120%)

C9H0589-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexachlorocyclopentadiene (28% @ 20%)

C9I0017-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (98% @ 80-120%), 4,6-Dinitro-2-Methylphenol (87% @ 80-120%), Benzoic Acid (103% @ 80-120%), Pentachlorophenol (95% @ 80-120%)

C9I0017-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
4-Nitrophenol (21% @ 20%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.24)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Arsenic	ND (2.62)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Beryllium	**0.73** (0.12)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Cadmium	ND (0.52)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Chromium	**12.1** (1.05)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Copper	**11.4** (2.62)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Lead	**8.02** (5.24)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Mercury	ND (0.016)		7471B		1	MKS	09/03/19 10:29	1.32	40	CH93041
Nickel	**9.89** (2.62)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Selenium	ND (5.24)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Silver	ND (0.52)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040
Thallium	ND (0.52)		6020A		1	NAR	09/04/19 16:36	2.09	100	CH93040
Zinc	**30.3** (2.62)		6010C		1	KJK	09/03/19 23:14	2.09	100	CH93040

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,3-Dichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1,4-Dioxane	ND (0.0694)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
1-Chlorohexane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
2-Butanone	ND (0.0347)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
2-Chlorotoluene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
2-Hexanone	ND (0.0347)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
4-Chlorotoluene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
4-Isopropyltoluene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
4-Methyl-2-Pentanone	ND (0.0347)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Acetone	ND (0.0347)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Benzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Bromobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Bromodichloromethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Bromoform	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Bromomethane	ND (0.0069)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Carbon Disulfide	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Chlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Chloroethane	ND (0.0069)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Chloroform	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Chloromethane	ND (0.0069)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
cis-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Dibromochloromethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Dibromomethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Dichlorodifluoromethane	ND (0.0069)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Diethyl Ether	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Di-isopropyl ether	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Ethylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Isopropylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Methylene Chloride	ND (0.0173)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Naphthalene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
n-Butylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
n-Propylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
sec-Butylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Styrene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
tert-Butylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Tetrachloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Tetrahydrofuran	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
trans-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Trichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Vinyl Acetate	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Vinyl Chloride	ND (0.0069)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Xylene O	ND (0.0035)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Xylene P,M	ND (0.0069)		8260B Low		1	08/28/19 17:29	C9H0567	CH92823
Xylenes (Total)	ND (0.00694)		8260B Low		1	08/28/19 17:29		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*84 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*87 %*		*70-130*
Surrogate: Dibromofluoromethane	*89 %*		*70-130*
Surrogate: Toluene-d8	*93 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 20.9
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1221	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1232	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1242	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1248	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1254	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1260	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1262	ND (0.05)		8082A		1	08/29/19 13:33		CH92803
Aroclor 1268	ND (0.05)		8082A		1	08/29/19 13:33		CH92803

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*48 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*50 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*57 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*59 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 19.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/27/19 17:01

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**160** (43.0)		8100M		1	08/28/19 14:30	C9H0564	CH92709

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*93 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
1,2,4-Trichlorobenzene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
1,2-Dichlorobenzene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
1,3-Dichlorobenzene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
1,4-Dichlorobenzene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,3,4,6-Tetrachlorophenol	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,4,5-Trichlorophenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,4,6-Trichlorophenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,4-Dichlorophenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,4-Dimethylphenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,4-Dinitrophenol	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,4-Dinitrotoluene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2,6-Dinitrotoluene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2-Chloronaphthalene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2-Chlorophenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2-Methylnaphthalene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2-Methylphenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2-Nitroaniline	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
2-Nitrophenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
3,3´-Dichlorobenzidine	ND (0.690)		8270D		1	09/03/19 19:43	C9I0017	CH92910
3+4-Methylphenol	ND (0.690)		8270D		1	09/03/19 19:43	C9I0017	CH92910
3-Nitroaniline	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4,6-Dinitro-2-Methylphenol	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4-Bromophenyl-phenylether	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4-Chloro-3-Methylphenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4-Chloroaniline	ND (0.690)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4-Chloro-phenyl-phenyl ether	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4-Nitroaniline	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
4-Nitrophenol	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Acenaphthene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Acenaphthylene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Acetophenone	ND (0.690)		8270D		1	09/03/19 19:43	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.690)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Anthracene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Azobenzene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzo(a)anthracene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzo(a)pyrene	ND (0.173)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzo(b)fluoranthene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzo(g,h,i)perylene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzo(k)fluoranthene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzoic Acid	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Benzyl Alcohol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
bis(2-Chloroethoxy)methane	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
bis(2-Chloroethyl)ether	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
bis(2-chloroisopropyl)Ether	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
bis(2-Ethylhexyl)phthalate	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Butylbenzylphthalate	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Carbazole	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Chrysene	ND (0.173)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Dibenzo(a,h)Anthracene	ND (0.173)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Dibenzofuran	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Diethylphthalate	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Dimethylphthalate	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Di-n-butylphthalate	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Di-n-octylphthalate	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Fluoranthene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Fluorene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Hexachlorobenzene	ND (0.173)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Hexachlorobutadiene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Hexachlorocyclopentadiene	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Hexachloroethane	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Indeno(1,2,3-cd)Pyrene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Isophorone	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Naphthalene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 0-2ft
Date Sampled: 08/27/19 09:00
Percent Solids: 91
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
N-Nitrosodimethylamine	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
N-Nitroso-Di-n-Propylamine	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
N-nitrosodiphenylamine	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Pentachlorophenol	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Phenanthrene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Phenol	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Pyrene	ND (0.344)		8270D		1	09/03/19 19:43	C9I0017	CH92910
Pyridine	ND (1.73)		8270D		1	09/03/19 19:43	C9I0017	CH92910

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*59 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*70 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*67 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*65 %*		*30-130*
Surrogate: 2-Fluorophenol	*65 %*		*30-130*
Surrogate: Nitrobenzene-d5	*61 %*		*30-130*
Surrogate: Phenol-d6	*67 %*		*30-130*
Surrogate: p-Terphenyl-d14	*72 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (3.98)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Arsenic	**3.16** (1.99)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Beryllium	**0.40** (0.09)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Cadmium	ND (0.40)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Chromium	**14.0** (0.80)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Copper	**14.3** (1.99)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Lead	**27.8** (3.98)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Mercury	**0.033** (0.028)		7471B		1	MKS	09/03/19 10:39	0.79	40	CH93041
Nickel	**11.5** (1.99)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Selenium	ND (3.98)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Silver	ND (0.40)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040
Thallium	ND (0.40)		6020A		1	NAR	09/04/19 17:01	2.81	100	CH93040
Zinc	**41.8** (1.99)		6010C		1	KJK	09/03/19 23:44	2.81	100	CH93040

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,3-Dichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1,4-Dioxane	ND (0.0708)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
1-Chlorohexane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
2-Butanone	ND (0.0354)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
2-Chlorotoluene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
2-Hexanone	ND (0.0354)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
4-Chlorotoluene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
4-Isopropyltoluene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
4-Methyl-2-Pentanone	ND (0.0354)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Acetone	ND (0.0354)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Benzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Bromobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Bromodichloromethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Bromoform	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Bromomethane	ND (0.0071)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Carbon Disulfide	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Chlorobenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Chloroethane	ND (0.0071)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Chloroform	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Chloromethane	ND (0.0071)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
cis-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Dibromochloromethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Dibromomethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Dichlorodifluoromethane	ND (0.0071)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Diethyl Ether	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Di-isopropyl ether	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Ethylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Isopropylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Methylene Chloride	ND (0.0177)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Naphthalene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
n-Butylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
n-Propylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
sec-Butylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Styrene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
tert-Butylbenzene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Tetrachloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Tetrahydrofuran	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
trans-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Trichloroethene	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Vinyl Acetate	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Vinyl Chloride	ND (0.0071)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Xylene O	ND (0.0035)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Xylene P,M	ND (0.0071)		8260B Low		1	08/28/19 17:54	C9H0567	CH92823
Xylenes (Total)	ND (0.00708)		8260B Low		1	08/28/19 17:54		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*89 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*86 %*		*70-130*
Surrogate: Dibromofluoromethane	*92 %*		*70-130*
Surrogate: Toluene-d8	*94 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 19.7
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1221	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1232	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1242	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1248	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1254	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1260	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1262	ND (0.06)		8082A		1	08/29/19 13:53		CH92803
Aroclor 1268	ND (0.06)		8082A		1	08/29/19 13:53		CH92803

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*35 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*38 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*40 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*43 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 19.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/27/19 17:01

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**1850** (860)		8100M		20	08/28/19 21:41	C9H0564	CH92709

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
1,2,4-Trichlorobenzene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
1,2-Dichlorobenzene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
1,3-Dichlorobenzene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
1,4-Dichlorobenzene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,3,4,6-Tetrachlorophenol	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,4,5-Trichlorophenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,4,6-Trichlorophenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,4-Dichlorophenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,4-Dimethylphenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,4-Dinitrophenol	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,4-Dinitrotoluene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2,6-Dinitrotoluene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2-Chloronaphthalene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2-Chlorophenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2-Methylnaphthalene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2-Methylphenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2-Nitroaniline	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
2-Nitrophenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
3,3´-Dichlorobenzidine	ND (0.746)		8270D		1	09/03/19 20:11	C9I0017	CH92910
3+4-Methylphenol	ND (0.746)		8270D		1	09/03/19 20:11	C9I0017	CH92910
3-Nitroaniline	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4,6-Dinitro-2-Methylphenol	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4-Bromophenyl-phenylether	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4-Chloro-3-Methylphenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4-Chloroaniline	ND (0.746)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4-Chloro-phenyl-phenyl ether	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4-Nitroaniline	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
4-Nitrophenol	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Acenaphthene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Acenaphthylene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Acetophenone	ND (0.746)		8270D		1	09/03/19 20:11	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.746)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Anthracene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Azobenzene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzo(a)anthracene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzo(a)pyrene	ND (0.187)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzo(b)fluoranthene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzo(g,h,i)perylene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzo(k)fluoranthene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzoic Acid	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Benzyl Alcohol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
bis(2-Chloroethoxy)methane	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
bis(2-Chloroethyl)ether	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
bis(2-chloroisopropyl)Ether	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
bis(2-Ethylhexyl)phthalate	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Butylbenzylphthalate	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Carbazole	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Chrysene	ND (0.187)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Dibenzo(a,h)Anthracene	ND (0.187)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Dibenzofuran	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Diethylphthalate	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Dimethylphthalate	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Di-n-butylphthalate	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Di-n-octylphthalate	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Fluoranthene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Fluorene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Hexachlorobenzene	ND (0.187)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Hexachlorobutadiene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Hexachlorocyclopentadiene	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Hexachloroethane	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Indeno(1,2,3-cd)Pyrene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Isophorone	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Naphthalene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 2-4ft
Date Sampled: 08/27/19 09:15
Percent Solids: 89
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
N-Nitrosodimethylamine	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
N-Nitroso-Di-n-Propylamine	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
N-nitrosodiphenylamine	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Pentachlorophenol	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Phenanthrene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Phenol	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Pyrene	ND (0.372)		8270D		1	09/03/19 20:11	C9I0017	CH92910
Pyridine	ND (1.87)		8270D		1	09/03/19 20:11	C9I0017	CH92910

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*37 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*45 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*43 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*47 %*		*30-130*
Surrogate: 2-Fluorophenol	*41 %*		*30-130*
Surrogate: Nitrobenzene-d5	*35 %*		*30-130*
Surrogate: Phenol-d6	*42 %*		*30-130*
Surrogate: p-Terphenyl-d14	*51 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.49)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Arsenic	**4.79** (2.24)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Beryllium	**0.32** (0.10)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Cadmium	ND (0.45)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Chromium	**11.5** (0.90)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Copper	**23.8** (2.24)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Lead	**90.3** (4.49)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Mercury	**0.215** (0.025)		7471B		1	MKS	09/03/19 10:54	0.88	40	CH93041
Nickel	**8.35** (2.24)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Selenium	ND (4.49)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Silver	ND (0.45)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Thallium	ND (4.49)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040
Zinc	**68.9** (2.24)		6010C		1	KJK	09/04/19 0:03	2.51	100	CH93040

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,1,1-Trichloroethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,1,2,2-Tetrachloroethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,1,2-Trichloroethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,1-Dichloroethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,1-Dichloroethene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,1-Dichloropropene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2,3-Trichlorobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2,3-Trichloropropane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2,4-Trichlorobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2,4-Trimethylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2-Dibromo-3-Chloropropane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2-Dibromoethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2-Dichlorobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2-Dichloroethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,2-Dichloropropane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,3,5-Trimethylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,3-Dichlorobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,3-Dichloropropane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,4-Dichlorobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1,4-Dioxane	ND (0.0880)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
1-Chlorohexane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
2,2-Dichloropropane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
2-Butanone	ND (0.0440)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
2-Chlorotoluene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
2-Hexanone	ND (0.0440)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
4-Chlorotoluene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
4-Isopropyltoluene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
4-Methyl-2-Pentanone	ND (0.0440)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Acetone	ND (0.0440)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Benzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Bromobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Bromodichloromethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Bromoform	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Bromomethane	ND (0.0088)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Carbon Disulfide	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Carbon Tetrachloride	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Chlorobenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Chloroethane	ND (0.0088)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Chloroform	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Chloromethane	ND (0.0088)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
cis-1,2-Dichloroethene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
cis-1,3-Dichloropropene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Dibromochloromethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Dibromomethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Dichlorodifluoromethane	ND (0.0088)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Diethyl Ether	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Di-isopropyl ether	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Ethyl tertiary-butyl ether	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Ethylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Hexachlorobutadiene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Isopropylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Methyl tert-Butyl Ether	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Methylene Chloride	ND (0.0220)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Naphthalene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
n-Butylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
n-Propylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
sec-Butylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Styrene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
tert-Butylbenzene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Tertiary-amyl methyl ether	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Tetrachloroethene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Tetrahydrofuran	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
trans-1,2-Dichloroethene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
trans-1,3-Dichloropropene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Trichloroethene	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Trichlorofluoromethane	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Vinyl Acetate	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Vinyl Chloride	ND (0.0088)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Xylene O	ND (0.0044)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Xylene P,M	ND (0.0088)		8260B Low		1	08/29/19 19:58	C9H0616	CH92957
Xylenes (Total)	ND (0.00880)		8260B Low		1	08/29/19 19:58		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*90 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*89 %*		*70-130*
Surrogate: Dibromofluoromethane	*86 %*		*70-130*
Surrogate: Toluene-d8	*94 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 20.2
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1221	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1232	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1242	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1248	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1254	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1260 [2C]	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1262	ND (0.06)		8082A		1	08/29/19 14:12		CH92803
Aroclor 1268	ND (0.06)		8082A		1	08/29/19 14:12		CH92803

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*62 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*64 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*62 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*74 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 19.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/27/19 17:01

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**233** (42.5)		8100M		1	08/28/19 15:48	C9H0564	CH92709

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*87 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 14.7
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
1,2,4-Trichlorobenzene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
1,2-Dichlorobenzene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
1,3-Dichlorobenzene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
1,4-Dichlorobenzene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,3,4,6-Tetrachlorophenol	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,4,5-Trichlorophenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,4,6-Trichlorophenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,4-Dichlorophenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,4-Dimethylphenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,4-Dinitrophenol	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,4-Dinitrotoluene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2,6-Dinitrotoluene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2-Chloronaphthalene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2-Chlorophenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2-Methylnaphthalene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2-Methylphenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2-Nitroaniline	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
2-Nitrophenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
3,3′-Dichlorobenzidine	ND (0.767)		8270D		1	09/03/19 20:40	C9I0017	CH92910
3+4-Methylphenol	ND (0.767)		8270D		1	09/03/19 20:40	C9I0017	CH92910
3-Nitroaniline	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4,6-Dinitro-2-Methylphenol	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4-Bromophenyl-phenylether	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4-Chloro-3-Methylphenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4-Chloroaniline	ND (0.767)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4-Chloro-phenyl-phenyl ether	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4-Nitroaniline	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
4-Nitrophenol	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Acenaphthene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Acenaphthylene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Acetophenone	ND (0.767)		8270D		1	09/03/19 20:40	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 14.7
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.767)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Anthracene	**0.879** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Azobenzene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzo(a)anthracene	**2.29** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzo(a)pyrene	**1.98** (0.192)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzo(b)fluoranthene	**1.40** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzo(g,h,i)perylene	**1.11** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzo(k)fluoranthene	**2.07** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzoic Acid	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Benzyl Alcohol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
bis(2-Chloroethoxy)methane	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
bis(2-Chloroethyl)ether	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
bis(2-chloroisopropyl)Ether	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
bis(2-Ethylhexyl)phthalate	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Butylbenzylphthalate	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Carbazole	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Chrysene	**2.04** (0.192)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Dibenzo(a,h)Anthracene	**0.510** (0.192)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Dibenzofuran	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Diethylphthalate	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Dimethylphthalate	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Di-n-butylphthalate	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Di-n-octylphthalate	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Fluoranthene	**4.35** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Fluorene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Hexachlorobenzene	ND (0.192)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Hexachlorobutadiene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Hexachlorocyclopentadiene	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Hexachloroethane	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Indeno(1,2,3-cd)Pyrene	**1.10** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Isophorone	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Naphthalene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 4-6ft
Date Sampled: 08/27/19 09:30
Percent Solids: 89
Initial Volume: 14.7
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
N-Nitrosodimethylamine	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
N-Nitroso-Di-n-Propylamine	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
N-nitrosodiphenylamine	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Pentachlorophenol	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Phenanthrene	**3.52** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Phenol	ND (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Pyrene	**4.02** (0.383)		8270D		1	09/03/19 20:40	C9I0017	CH92910
Pyridine	ND (1.92)		8270D		1	09/03/19 20:40	C9I0017	CH92910

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*47 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*58 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*52 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*53 %*		*30-130*
Surrogate: 2-Fluorophenol	*48 %*		*30-130*
Surrogate: Nitrobenzene-d5	*45 %*		*30-130*
Surrogate: Phenol-d6	*52 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.37)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Arsenic	**5.09** (2.68)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Beryllium	**0.67** (0.12)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Cadmium	ND (0.54)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Chromium	**20.1** (1.07)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Copper	**14.4** (2.68)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Lead	**60.6** (5.37)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Mercury	ND (0.025)		7471B		1	MKS	09/03/19 10:56	0.9	40	CH93041
Nickel	**14.1** (2.68)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Selenium	ND (5.37)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Silver	ND (0.54)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040
Thallium	ND (0.54)		6020A		1	NAR	09/04/19 17:35	2.11	100	CH93040
Zinc	**45.9** (2.68)		6010C		1	KJK	09/04/19 0:06	2.11	100	CH93040

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,1,1-Trichloroethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,1,2,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,1,2-Trichloroethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,1-Dichloroethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,1-Dichloroethene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,1-Dichloropropene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2,3-Trichlorobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2,3-Trichloropropane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2,4-Trichlorobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2,4-Trimethylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2-Dibromo-3-Chloropropane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2-Dibromoethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2-Dichlorobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2-Dichloroethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,2-Dichloropropane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,3,5-Trimethylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,3-Dichlorobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,3-Dichloropropane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,4-Dichlorobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1,4-Dioxane	ND (0.0786)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
1-Chlorohexane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
2,2-Dichloropropane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
2-Butanone	ND (0.0393)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
2-Chlorotoluene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
2-Hexanone	ND (0.0393)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
4-Chlorotoluene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
4-Isopropyltoluene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
4-Methyl-2-Pentanone	ND (0.0393)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Acetone	ND (0.0393)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Benzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Bromobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Bromodichloromethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Bromoform	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Bromomethane	ND (0.0079)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Carbon Disulfide	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Carbon Tetrachloride	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Chlorobenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Chloroethane	ND (0.0079)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Chloroform	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Chloromethane	ND (0.0079)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
cis-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
cis-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Dibromochloromethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Dibromomethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Diethyl Ether	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Di-isopropyl ether	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Ethyl tertiary-butyl ether	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Ethylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Hexachlorobutadiene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Isopropylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Methyl tert-Butyl Ether	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Methylene Chloride	ND (0.0197)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Naphthalene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
n-Butylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
n-Propylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
sec-Butylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Styrene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
tert-Butylbenzene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Tertiary-amyl methyl ether	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Tetrachloroethene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Tetrahydrofuran	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
trans-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
trans-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Trichloroethene	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Trichlorofluoromethane	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Vinyl Acetate	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Vinyl Chloride	ND (0.0079)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Xylene O	ND (0.0039)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Xylene P,M	ND (0.0079)		8260B Low		1	08/29/19 20:24	C9H0616	CH92957
Xylenes (Total)	ND (0.00786)		8260B Low		1	08/29/19 20:24		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*90 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*87 %*		*70-130*
Surrogate: Dibromofluoromethane	*90 %*		*70-130*
Surrogate: Toluene-d8	*92 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 20.3
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1221	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1232	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1242	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1248	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1254	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1260	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1262	ND (0.06)		8082A		1	08/29/19 14:31		CH92803
Aroclor 1268	ND (0.06)		8082A		1	08/29/19 14:31		CH92803

	%Recovery	*Qualifier*	*Limits*
Surrogate: Decachlorobiphenyl	*76 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*75 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*67 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*82 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 20
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/27/19 17:01

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**136** (42.5)		8100M		1	08/28/19 16:20	C9H0564	CH92709

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*76 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
1,2,4-Trichlorobenzene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
1,2-Dichlorobenzene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
1,3-Dichlorobenzene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
1,4-Dichlorobenzene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,3,4,6-Tetrachlorophenol	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,4,5-Trichlorophenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,4,6-Trichlorophenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,4-Dichlorophenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,4-Dimethylphenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,4-Dinitrophenol	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,4-Dinitrotoluene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2,6-Dinitrotoluene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2-Chloronaphthalene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2-Chlorophenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2-Methylnaphthalene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2-Methylphenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2-Nitroaniline	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
2-Nitrophenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
3,3´-Dichlorobenzidine	ND (0.712)		8270D		1	09/03/19 21:08	C9I0017	CH92910
3+4-Methylphenol	ND (0.712)		8270D		1	09/03/19 21:08	C9I0017	CH92910
3-Nitroaniline	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4,6-Dinitro-2-Methylphenol	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4-Bromophenyl-phenylether	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4-Chloro-3-Methylphenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4-Chloroaniline	ND (0.712)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4-Chloro-phenyl-phenyl ether	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4-Nitroaniline	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
4-Nitrophenol	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Acenaphthene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Acenaphthylene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Acetophenone	ND (0.712)		8270D		1	09/03/19 21:08	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.712)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Anthracene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Azobenzene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzo(a)anthracene	**0.388** (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzo(a)pyrene	**0.300** (0.178)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzo(b)fluoranthene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzo(g,h,i)perylene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzo(k)fluoranthene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzoic Acid	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Benzyl Alcohol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
bis(2-Chloroethoxy)methane	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
bis(2-Chloroethyl)ether	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
bis(2-chloroisopropyl)Ether	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
bis(2-Ethylhexyl)phthalate	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Butylbenzylphthalate	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Carbazole	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Chrysene	**0.324** (0.178)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Dibenzo(a,h)Anthracene	ND (0.178)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Dibenzofuran	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Diethylphthalate	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Dimethylphthalate	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Di-n-butylphthalate	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Di-n-octylphthalate	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Fluoranthene	**1.02** (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Fluorene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Hexachlorobenzene	ND (0.178)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Hexachlorobutadiene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Hexachlorocyclopentadiene	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Hexachloroethane	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Indeno(1,2,3-cd)Pyrene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Isophorone	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Naphthalene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-5 6-10ft
Date Sampled: 08/27/19 09:45
Percent Solids: 88
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0859
ESS Laboratory Sample ID: 19H0859-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/29/19 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
N-Nitrosodimethylamine	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
N-Nitroso-Di-n-Propylamine	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
N-nitrosodiphenylamine	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Pentachlorophenol	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Phenanthrene	**1.12** (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Phenol	ND (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Pyrene	**0.844** (0.356)		8270D		1	09/03/19 21:08	C9I0017	CH92910
Pyridine	ND (1.78)		8270D		1	09/03/19 21:08	C9I0017	CH92910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*45 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*58 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*48 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*49 %*		*30-130*
Surrogate: 2-Fluorophenol	*46 %*		*30-130*
Surrogate: Nitrobenzene-d5	*42 %*		*30-130*
Surrogate: Phenol-d6	*46 %*		*30-130*
Surrogate: p-Terphenyl-d14	*65 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CH93040 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
LCS										
Antimony	51.0	17.9	mg/kg wet	42.40		120	80-120			
Arsenic	128	8.93	mg/kg wet	128.0		100	80-120			
Beryllium	226	0.39	mg/kg wet	217.0		104	80-120			
Cadmium	99.2	1.79	mg/kg wet	99.00		100	80-120			
Chromium	125	3.57	mg/kg wet	116.0		108	80-120			
Copper	94.3	8.93	mg/kg wet	89.60		105	80-120			
Lead	297	17.9	mg/kg wet	277.0		107	40-160			
Nickel	114	8.93	mg/kg wet	107.0		106	80-120			
Selenium	247	17.9	mg/kg wet	242.0		102	80-120			
Silver	65.9	1.79	mg/kg wet	64.30		102	80-120			
Thallium	189	8.93	mg/kg wet	183.0		103	80-120			
Thallium	198	17.9	mg/kg wet	183.0		108	80-120			
Zinc	532	8.93	mg/kg wet	561.0		95	80-120			
LCS Dup										
Antimony	53.0	18.9	mg/kg wet	42.40		125	40-160	4	20	
Arsenic	133	9.43	mg/kg wet	128.0		104	80-120	3	20	
Beryllium	226	0.42	mg/kg wet	217.0		104	80-120	0.08	20	
Cadmium	98.2	1.89	mg/kg wet	99.00		99	80-120	1	20	
Chromium	123	3.77	mg/kg wet	116.0		106	80-120	2	20	
Copper	94.4	9.43	mg/kg wet	89.60		105	80-120	0.05	20	
Lead	293	18.9	mg/kg wet	277.0		106	80-120	1	20	
Nickel	113	9.43	mg/kg wet	107.0		105	80-120	1	20	
Selenium	245	18.9	mg/kg wet	242.0		101	80-120	1	20	
Silver	65.4	1.89	mg/kg wet	64.30		102	80-120	0.7	20	
Thallium	197	18.9	mg/kg wet	183.0		107	80-120	0.7	20	
Thallium	193	9.43	mg/kg wet	183.0		105	80-120	2	30	
Zinc	531	9.43	mg/kg wet	561.0		95	80-120	0.2	20	
Batch CH93041 - 7471B										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CH93041 - 7471B										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	22.3	3.81	mg/kg wet	27.30		82	80-120			
LCS Dup										
Mercury	22.9	3.60	mg/kg wet	27.30		84	80-120	3	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92823 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92823 - 5035										
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0371*		mg/kg wet	*0.05000*		*74*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0432*		mg/kg wet	*0.05000*		*86*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0415*		mg/kg wet	*0.05000*		*83*	*70-130*			
Surrogate: Toluene-d8	*0.0478*		mg/kg wet	*0.05000*		*96*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,1-Trichloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CH92823 - 5035										
1,1,2,2-Tetrachloroethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,1-Dichloroethane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,1-Dichloroethene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
1,1-Dichloropropene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,3-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichloropropane	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
1,2,4-Trichlorobenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,4-Trimethylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
1,2-Dibromo-3-Chloropropane	0.0382	0.0050	mg/kg wet	0.05000		76	70-130			
1,2-Dibromoethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dichloroethane	0.0397	0.0050	mg/kg wet	0.05000		79	70-130			
1,2-Dichloropropane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,3,5-Trimethylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
1,3-Dichlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,3-Dichloropropane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
1,4-Dichlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,4-Dioxane	0.947	0.100	mg/kg wet	1.000		95	70-130			
1-Chlorohexane	0.0604	0.0050	mg/kg wet	0.05000		121	70-130			
2,2-Dichloropropane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
2-Butanone	0.235	0.0500	mg/kg wet	0.2500		94	70-130			
2-Chlorotoluene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
2-Hexanone	0.210	0.0500	mg/kg wet	0.2500		84	70-130			
4-Chlorotoluene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
4-Isopropyltoluene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
4-Methyl-2-Pentanone	0.214	0.0500	mg/kg wet	0.2500		85	70-130			
Acetone	0.201	0.0500	mg/kg wet	0.2500		80	70-130			
Benzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Bromobenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Bromochloromethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Bromodichloromethane	0.0416	0.0050	mg/kg wet	0.05000		83	70-130			
Bromoform	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
Bromomethane	0.0440	0.0100	mg/kg wet	0.05000		88	70-130			
Carbon Disulfide	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Carbon Tetrachloride	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Chlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Chloroethane	0.0438	0.0100	mg/kg wet	0.05000		88	70-130			
Chloroform	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
Chloromethane	0.0422	0.0100	mg/kg wet	0.05000		84	70-130			
cis-1,2-Dichloroethene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
cis-1,3-Dichloropropene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Dibromochloromethane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromomethane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Dichlorodifluoromethane	0.0316	0.0100	mg/kg wet	0.05000		63	70-130			B-

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92823 - 5035										
Diethyl Ether	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Ethyl tertiary-butyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Ethylbenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Hexachlorobutadiene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
Isopropylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Methyl tert-Butyl Ether	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Methylene Chloride	0.0449	0.0250	mg/kg wet	0.05000		90	70-130			
Naphthalene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
n-Butylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
n-Propylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
sec-Butylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Styrene	0.0557	0.0050	mg/kg wet	0.05000		111	70-130			
tert-Butylbenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Tertiary-amyl methyl ether	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Tetrachloroethene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Tetrahydrofuran	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Toluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
trans-1,2-Dichloroethene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
trans-1,3-Dichloropropene	0.0408	0.0050	mg/kg wet	0.05000		82	70-130			
Trichloroethene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
Trichlorofluoromethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
Vinyl Acetate	0.0416	0.0050	mg/kg wet	0.05000		83	70-130			
Vinyl Chloride	0.0463	0.0100	mg/kg wet	0.05000		93	70-130			
Xylene O	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Xylene P,M	0.115	0.0100	mg/kg wet	0.1000		115	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0359*		mg/kg wet	*0.05000*		*72*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0445*		mg/kg wet	*0.05000*		*89*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0422*		mg/kg wet	*0.05000*		*84*	*70-130*			
Surrogate: Toluene-d8	*0.0485*		mg/kg wet	*0.05000*		*97*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,1,1-Trichloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	4	25	
1,1,2,2-Tetrachloroethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	0.2	25	
1,1,2-Trichloroethane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
1,1-Dichloroethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
1,1-Dichloroethene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
1,1-Dichloropropene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
1,2,3-Trichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.6	25	
1,2,3-Trichloropropane	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
1,2,4-Trichlorobenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	1	25	
1,2,4-Trimethylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
1,2-Dibromo-3-Chloropropane	0.0379	0.0050	mg/kg wet	0.05000		76	70-130	0.9	25	
1,2-Dibromoethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	0.7	25	
1,2-Dichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	3	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92823 - 5035										
1,2-Dichloroethane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130	2	25	
1,2-Dichloropropane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
1,3,5-Trimethylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
1,3-Dichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
1,3-Dichloropropane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	0	25	
1,4-Dichlorobenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	1	25	
1,4-Dioxane	0.965	0.100	mg/kg wet	1.000		97	70-130	2	20	
1-Chlorohexane	0.0590	0.0050	mg/kg wet	0.05000		118	70-130	2	25	
2,2-Dichloropropane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
2-Butanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130	3	25	
2-Chlorotoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
2-Hexanone	0.214	0.0500	mg/kg wet	0.2500		86	70-130	2	25	
4-Chlorotoluene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
4-Isopropyltoluene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
4-Methyl-2-Pentanone	0.212	0.0500	mg/kg wet	0.2500		85	70-130	0.7	25	
Acetone	0.192	0.0500	mg/kg wet	0.2500		77	70-130	5	25	
Benzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
Bromochloromethane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	4	25	
Bromodichloromethane	0.0407	0.0050	mg/kg wet	0.05000		81	70-130	2	25	
Bromoform	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	1	25	
Bromomethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130	5	25	
Carbon Disulfide	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Carbon Tetrachloride	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Chlorobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	0.8	25	
Chloroethane	0.0419	0.0100	mg/kg wet	0.05000		84	70-130	4	25	
Chloroform	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	3	25	
Chloromethane	0.0411	0.0100	mg/kg wet	0.05000		82	70-130	3	25	
cis-1,2-Dichloroethene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
cis-1,3-Dichloropropene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
Dibromochloromethane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	0.5	25	
Dibromomethane	0.0432	0.0050	mg/kg wet	0.05000		86	70-130	3	25	
Dichlorodifluoromethane	0.0299	0.0100	mg/kg wet	0.05000		60	70-130	6	25	B-
Diethyl Ether	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	0.9	25	
Di-isopropyl ether	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Ethyl tertiary-butyl ether	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
Ethylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
Hexachlorobutadiene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	3	25	
Isopropylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Methyl tert-Butyl Ether	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
Methylene Chloride	0.0436	0.0250	mg/kg wet	0.05000		87	70-130	3	25	
Naphthalene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	0.1	25	
n-Butylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
n-Propylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
sec-Butylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92823 - 5035										
Styrene	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	0.5	25	
tert-Butylbenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Tertiary-amyl methyl ether	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	1	25	
Tetrachloroethene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
Tetrahydrofuran	0.0419	0.0050	mg/kg wet	0.05000		84	70-130	2	25	
Toluene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
trans-1,2-Dichloroethene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
trans-1,3-Dichloropropene	0.0401	0.0050	mg/kg wet	0.05000		80	70-130	2	25	
Trichloroethene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Trichlorofluoromethane	0.0407	0.0050	mg/kg wet	0.05000		81	70-130	4	25	
Vinyl Acetate	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	2	25	
Vinyl Chloride	0.0443	0.0100	mg/kg wet	0.05000		89	70-130	4	25	
Xylene O	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130	1	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0354*		mg/kg wet	*0.05000*		*71*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0451*		mg/kg wet	*0.05000*		*90*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0424*		mg/kg wet	*0.05000*		*85*	*70-130*			
Surrogate: Toluene-d8	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			
Batch CH92957 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92957 - 5035										
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92957 - 5035										
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0422*		mg/kg wet	*0.05000*		*84*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0439*		mg/kg wet	*0.05000*		*88*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0439*		mg/kg wet	*0.05000*		*88*	*70-130*			
Surrogate: Toluene-d8	*0.0472*		mg/kg wet	*0.05000*		*94*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
1,1,1-Trichloroethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,2,2-Tetrachloroethane	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
1,1,2-Trichloroethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,1-Dichloroethene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloropropene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,3-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichloropropane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
1,2,4-Trichlorobenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,4-Trimethylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dibromo-3-Chloropropane	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
1,2-Dibromoethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichlorobenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dichloroethane	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
1,2-Dichloropropane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,3,5-Trimethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,3-Dichloropropane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,4-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,4-Dioxane	1.01	0.100	mg/kg wet	1.000		101	70-130			
1-Chlorohexane	0.0569	0.0050	mg/kg wet	0.05000		114	70-130			
2,2-Dichloropropane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
2-Butanone	0.241	0.0500	mg/kg wet	0.2500		96	70-130			
2-Chlorotoluene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
2-Hexanone	0.224	0.0500	mg/kg wet	0.2500		90	70-130			
4-Chlorotoluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
4-Isopropyltoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
4-Methyl-2-Pentanone	0.221	0.0500	mg/kg wet	0.2500		88	70-130			
Acetone	0.208	0.0500	mg/kg wet	0.2500		83	70-130			
Benzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Bromobenzene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Bromochloromethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Bromodichloromethane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
Bromoform	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Bromomethane	0.0466	0.0100	mg/kg wet	0.05000		93	70-130			
Carbon Disulfide	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92957 - 5035										
Carbon Tetrachloride	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
Chlorobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
Chloroethane	0.0421	0.0100	mg/kg wet	0.05000		84	70-130			
Chloroform	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
Chloromethane	0.0443	0.0100	mg/kg wet	0.05000		89	70-130			
cis-1,2-Dichloroethene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
cis-1,3-Dichloropropene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromochloromethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Dibromomethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Dichlorodifluoromethane	0.0355	0.0100	mg/kg wet	0.05000		71	70-130			
Diethyl Ether	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Di-isopropyl ether	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Ethyl tertiary-butyl ether	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Ethylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Hexachlorobutadiene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
Isopropylbenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Methyl tert-Butyl Ether	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Methylene Chloride	0.0444	0.0250	mg/kg wet	0.05000		89	70-130			
Naphthalene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
n-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
n-Propylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
sec-Butylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Styrene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
tert-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Tertiary-amyl methyl ether	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Tetrachloroethene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
Tetrahydrofuran	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Toluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
trans-1,2-Dichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
trans-1,3-Dichloropropene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
Trichloroethene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Trichlorofluoromethane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Vinyl Acetate	0.0418	0.0050	mg/kg wet	0.05000		84	70-130			
Vinyl Chloride	0.0483	0.0100	mg/kg wet	0.05000		97	70-130			
Xylene O	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Xylene P,M	0.114	0.0100	mg/kg wet	0.1000		114	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0416*		mg/kg wet	*0.05000*		*83*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0471*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0458*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0485*		mg/kg wet	*0.05000*		*97*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
1,1,1-Trichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	1	25	
1,1,2,2-Tetrachloroethane	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	5	25	
1,1,2-Trichloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	3	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CH92957 - 5035										
1,1-Dichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
1,1-Dichloroethene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	0.3	25	
1,1-Dichloropropene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.04	25	
1,2,3-Trichlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,2,3-Trichloropropane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	5	25	
1,2,4-Trichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	0.6	25	
1,2,4-Trimethylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	0.3	25	
1,2-Dibromo-3-Chloropropane	0.0393	0.0050	mg/kg wet	0.05000		79	70-130	3	25	
1,2-Dibromoethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,2-Dichlorobenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	0.3	25	
1,2-Dichloroethane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	4	25	
1,2-Dichloropropane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	0	25	
1,3,5-Trimethylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	0.8	25	
1,3-Dichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.2	25	
1,3-Dichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	6	25	
1,4-Dichlorobenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,4-Dioxane	0.969	0.100	mg/kg wet	1.000		97	70-130	4	20	
1-Chlorohexane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	3	25	
2,2-Dichloropropane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
2-Butanone	0.232	0.0500	mg/kg wet	0.2500		93	70-130	4	25	
2-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
2-Hexanone	0.206	0.0500	mg/kg wet	0.2500		82	70-130	8	25	
4-Chlorotoluene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
4-Isopropyltoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.04	25	
4-Methyl-2-Pentanone	0.208	0.0500	mg/kg wet	0.2500		83	70-130	6	25	
Acetone	0.204	0.0500	mg/kg wet	0.2500		82	70-130	2	25	
Benzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	0	25	
Bromobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Bromochloromethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
Bromodichloromethane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	1	25	
Bromoform	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	4	25	
Bromomethane	0.0454	0.0100	mg/kg wet	0.05000		91	70-130	3	25	
Carbon Disulfide	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	0.5	25	
Carbon Tetrachloride	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	0.5	25	
Chlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Chloroethane	0.0423	0.0100	mg/kg wet	0.05000		85	70-130	0.5	25	
Chloroform	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	0.6	25	
Chloromethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130	0.2	25	
cis-1,2-Dichloroethene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
cis-1,3-Dichloropropene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.8	25	
Dibromochloromethane	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	5	25	
Dibromomethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Dichlorodifluoromethane	0.0338	0.0100	mg/kg wet	0.05000		68	70-130	5	25	B-
Diethyl Ether	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
Di-isopropyl ether	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.7	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92957 - 5035										
Ethyl tertiary-butyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Ethylbenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
Hexachlorobutadiene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	0.08	25	
Isopropylbenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	0.04	25	
Methyl tert-Butyl Ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
Methylene Chloride	0.0440	0.0250	mg/kg wet	0.05000		88	70-130	0.9	25	
Naphthalene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
n-Butylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	0.1	25	
n-Propylbenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	0.7	25	
sec-Butylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
Styrene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	3	25	
tert-Butylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.1	25	
Tertiary-amyl methyl ether	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Tetrachloroethene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Tetrahydrofuran	0.0392	0.0050	mg/kg wet	0.05000		78	70-130	7	25	
Toluene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.4	25	
trans-1,2-Dichloroethene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	0.2	25	
trans-1,3-Dichloropropene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130	0.9	25	
Trichloroethene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.4	25	
Trichlorofluoromethane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	1	25	
Vinyl Acetate	0.0406	0.0050	mg/kg wet	0.05000		81	70-130	3	25	
Vinyl Chloride	0.0482	0.0100	mg/kg wet	0.05000		96	70-130	0.2	25	
Xylene O	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
Xylene P,M	0.110	0.0100	mg/kg wet	0.1000		110	70-130	4	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0396*		mg/kg wet	*0.05000*		*79*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0456*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0446*		mg/kg wet	*0.05000*		*89*	*70-130*			
Surrogate: Toluene-d8	*0.0476*		mg/kg wet	*0.05000*		*95*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CH92803 - 3540C										
Blank										
Aroclor 1016	ND	0.05	mg/kg wet							
Aroclor 1016 [2C]	ND	0.05	mg/kg wet							
Aroclor 1221	ND	0.05	mg/kg wet							
Aroclor 1221 [2C]	ND	0.05	mg/kg wet							
Aroclor 1232	ND	0.05	mg/kg wet							
Aroclor 1232 [2C]	ND	0.05	mg/kg wet							
Aroclor 1242	ND	0.05	mg/kg wet							
Aroclor 1242 [2C]	ND	0.05	mg/kg wet							
Aroclor 1248	ND	0.05	mg/kg wet							
Aroclor 1248 [2C]	ND	0.05	mg/kg wet							
Aroclor 1254	ND	0.05	mg/kg wet							
Aroclor 1254 [2C]	ND	0.05	mg/kg wet							
Aroclor 1260	ND	0.05	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CH92803 - 3540C										
Aroclor 1260 [2C]	ND	0.05	mg/kg wet							
Aroclor 1262	ND	0.05	mg/kg wet							
Aroclor 1262 [2C]	ND	0.05	mg/kg wet							
Aroclor 1268	ND	0.05	mg/kg wet							
Aroclor 1268 [2C]	ND	0.05	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0211*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0211*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0172*		mg/kg wet	*0.02500*		*69*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0178*		mg/kg wet	*0.02500*		*71*	*30-150*			
LCS										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		90	40-140			
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		94	40-140			
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		88	40-140			
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		89	40-140			
Surrogate: Decachlorobiphenyl	*0.0219*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0218*		mg/kg wet	*0.02500*		*87*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0183*		mg/kg wet	*0.02500*		*73*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0179*		mg/kg wet	*0.02500*		*72*	*30-150*			
LCS Dup										
Aroclor 1016	0.4	0.05	mg/kg wet	0.5000		89	40-140	1	30	
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		94	40-140	0.3	30	
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		90	40-140	2	30	
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		93	40-140	4	30	
Surrogate: Decachlorobiphenyl	*0.0221*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0219*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0180*		mg/kg wet	*0.02500*		*72*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0178*		mg/kg wet	*0.02500*		*71*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CH92709 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CH92709 - 3546										
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.66*		mg/kg wet	*5.000*		*93*	*40-140*			
LCS										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Hexacosane (C26)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Hexadecane (C16)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		67	30-140			
Octacosane (C28)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		83	40-140			
Total Petroleum Hydrocarbons	29.7	37.5	mg/kg wet	35.00		85	40-140			
Triacontane (C30)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Surrogate: O-Terphenyl	*4.44*		mg/kg wet	*5.000*		*89*	*40-140*			
LCS Dup										
Decane (C10)	2.0	0.2	mg/kg wet	2.500		79	40-140	6	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		94	40-140	5	25	
Dodecane (C12)	2.1	0.2	mg/kg wet	2.500		85	40-140	6	25	
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		92	40-140	5	25	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		93	40-140	5	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		90	40-140	6	25	
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		95	40-140	5	25	
Nonane (C9)	1.8	0.2	mg/kg wet	2.500		72	30-140	7	25	
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		94	40-140	5	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		92	40-140	5	25	
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		94	40-140	5	25	
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		88	40-140	6	25	
Total Petroleum Hydrocarbons	31.4	37.5	mg/kg wet	35.00		90	40-140	6	25	
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		93	40-140	5	25	
Surrogate: O-Terphenyl	*4.58*		mg/kg wet	*5.000*		*92*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.29*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.17*		mg/kg wet	*5.000*		*63*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.76*		mg/kg wet	*5.000*		*75*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.37*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2-Fluorophenol	*3.79*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.53*		mg/kg wet	*3.333*		*76*	*30-130*			
Surrogate: Phenol-d6	*3.81*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.94*		mg/kg wet	*3.333*		*88*	*30-130*			
LCS										
1,1-Biphenyl	2.47	0.333	mg/kg wet	3.333		74	40-140			
1,2,4-Trichlorobenzene	2.61	0.333	mg/kg wet	3.333		78	40-140			
1,2-Dichlorobenzene	2.58	0.333	mg/kg wet	3.333		77	40-140			
1,3-Dichlorobenzene	2.47	0.333	mg/kg wet	3.333		74	40-140			
1,4-Dichlorobenzene	2.42	0.333	mg/kg wet	3.333		73	40-140			
2,3,4,6-Tetrachlorophenol	2.39	1.67	mg/kg wet	3.333		72	30-130			
2,4,5-Trichlorophenol	2.55	0.333	mg/kg wet	3.333		76	30-130			
2,4,6-Trichlorophenol	2.44	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dichlorophenol	2.58	0.333	mg/kg wet	3.333		77	30-130			
2,4-Dimethylphenol	2.47	0.333	mg/kg wet	3.333		74	30-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
2,4-Dinitrophenol	2.37	1.67	mg/kg wet	3.333		71	30-130			
2,4-Dinitrotoluene	2.47	0.333	mg/kg wet	3.333		74	40-140			
2,6-Dinitrotoluene	2.66	0.333	mg/kg wet	3.333		80	40-140			
2-Chloronaphthalene	2.47	0.333	mg/kg wet	3.333		74	40-140			
2-Chlorophenol	2.57	0.333	mg/kg wet	3.333		77	30-130			
2-Methylnaphthalene	2.48	0.333	mg/kg wet	3.333		74	40-140			
2-Methylphenol	2.54	0.333	mg/kg wet	3.333		76	30-130			
2-Nitroaniline	2.50	0.333	mg/kg wet	3.333		75	40-140			
2-Nitrophenol	2.37	0.333	mg/kg wet	3.333		71	30-130			
3,3´-Dichlorobenzidine	2.50	0.667	mg/kg wet	3.333		75	40-140			
3+4-Methylphenol	5.58	0.667	mg/kg wet	6.667		84	30-130			
3-Nitroaniline	2.29	0.333	mg/kg wet	3.333		69	40-140			
4,6-Dinitro-2-Methylphenol	2.72	1.67	mg/kg wet	3.333		82	30-130			
4-Bromophenyl-phenylether	2.90	0.333	mg/kg wet	3.333		87	40-140			
4-Chloro-3-Methylphenol	2.61	0.333	mg/kg wet	3.333		78	30-130			
4-Chloroaniline	1.96	0.667	mg/kg wet	3.333		59	40-140			
4-Chloro-phenyl-phenyl ether	2.77	0.333	mg/kg wet	3.333		83	40-140			
4-Nitroaniline	2.45	0.333	mg/kg wet	3.333		74	40-140			
4-Nitrophenol	2.36	1.67	mg/kg wet	3.333		71	30-130			
Acenaphthene	2.41	0.333	mg/kg wet	3.333		72	40-140			
Acenaphthylene	2.20	0.333	mg/kg wet	3.333		66	40-140			
Acetophenone	2.43	0.667	mg/kg wet	3.333		73	40-140			
Aniline	1.97	0.667	mg/kg wet	3.333		59	40-140			
Anthracene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Azobenzene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Benzo(a)anthracene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Benzo(a)pyrene	2.46	0.167	mg/kg wet	3.333		74	40-140			
Benzo(b)fluoranthene	2.48	0.333	mg/kg wet	3.333		74	40-140			
Benzo(g,h,i)perylene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Benzo(k)fluoranthene	2.62	0.333	mg/kg wet	3.333		79	40-140			
Benzoic Acid	2.33	1.67	mg/kg wet	3.333		70	40-140			
Benzyl Alcohol	2.31	0.333	mg/kg wet	3.333		69	40-140			
bis(2-Chloroethoxy)methane	2.53	0.333	mg/kg wet	3.333		76	40-140			
bis(2-Chloroethyl)ether	2.61	0.333	mg/kg wet	3.333		78	40-140			
bis(2-chloroisopropyl)Ether	2.50	0.333	mg/kg wet	3.333		75	40-140			
bis(2-Ethylhexyl)phthalate	2.71	0.333	mg/kg wet	3.333		81	40-140			
Butylbenzylphthalate	2.73	0.333	mg/kg wet	3.333		82	40-140			
Carbazole	2.59	0.333	mg/kg wet	3.333		78	40-140			
Chrysene	2.59	0.167	mg/kg wet	3.333		78	40-140			
Dibenzo(a,h)Anthracene	2.61	0.167	mg/kg wet	3.333		78	40-140			
Dibenzofuran	2.52	0.333	mg/kg wet	3.333		76	40-140			
Diethylphthalate	2.71	0.333	mg/kg wet	3.333		81	40-140			
Dimethylphthalate	2.66	0.333	mg/kg wet	3.333		80	40-140			
Di-n-butylphthalate	2.93	0.333	mg/kg wet	3.333		88	40-140			
Di-n-octylphthalate	2.67	0.333	mg/kg wet	3.333		80	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
Fluoranthene	2.64	0.333	mg/kg wet	3.333		79	40-140			
Fluorene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Hexachlorobenzene	2.71	0.167	mg/kg wet	3.333		81	40-140			
Hexachlorobutadiene	2.48	0.333	mg/kg wet	3.333		74	40-140			
Hexachlorocyclopentadiene	1.51	1.67	mg/kg wet	3.333		45	40-140			
Hexachloroethane	2.26	0.333	mg/kg wet	3.333		68	40-140			
Indeno(1,2,3-cd)Pyrene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Isophorone	2.16	0.333	mg/kg wet	3.333		65	40-140			
Naphthalene	2.53	0.333	mg/kg wet	3.333		76	40-140			
Nitrobenzene	2.43	0.333	mg/kg wet	3.333		73	40-140			
N-Nitrosodimethylamine	2.46	0.333	mg/kg wet	3.333		74	40-140			
N-Nitroso-Di-n-Propylamine	2.62	0.333	mg/kg wet	3.333		78	40-140			
N-nitrosodiphenylamine	2.74	0.333	mg/kg wet	3.333		82	40-140			
Pentachlorophenol	2.58	1.67	mg/kg wet	3.333		77	30-130			
Phenanthrene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Phenol	2.68	0.333	mg/kg wet	3.333		80	30-130			
Pyrene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Pyridine	2.16	1.67	mg/kg wet	3.333		65	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.28*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.78*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.84*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.47*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: 2-Fluorophenol	*3.94*		mg/kg wet	*5.000*		*79*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.63*		mg/kg wet	*3.333*		*79*	*30-130*			
Surrogate: Phenol-d6	*4.01*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.56*		mg/kg wet	*3.333*		*77*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.57	0.333	mg/kg wet	3.333		77	40-140	4	30	
1,2,4-Trichlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140	6	30	
1,2-Dichlorobenzene	2.69	0.333	mg/kg wet	3.333		81	40-140	4	30	
1,3-Dichlorobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140	4	30	
1,4-Dichlorobenzene	2.53	0.333	mg/kg wet	3.333		76	40-140	4	30	
2,3,4,6-Tetrachlorophenol	2.55	1.67	mg/kg wet	3.333		77	30-130	7	30	
2,4,5-Trichlorophenol	2.63	0.333	mg/kg wet	3.333		79	30-130	3	30	
2,4,6-Trichlorophenol	2.68	0.333	mg/kg wet	3.333		81	30-130	10	30	
2,4-Dichlorophenol	2.75	0.333	mg/kg wet	3.333		82	30-130	6	30	
2,4-Dimethylphenol	2.65	0.333	mg/kg wet	3.333		79	30-130	7	30	
2,4-Dinitrophenol	2.65	1.67	mg/kg wet	3.333		79	30-130	11	30	
2,4-Dinitrotoluene	2.64	0.333	mg/kg wet	3.333		79	40-140	6	30	
2,6-Dinitrotoluene	2.78	0.333	mg/kg wet	3.333		83	40-140	4	30	
2-Chloronaphthalene	2.61	0.333	mg/kg wet	3.333		78	40-140	6	30	
2-Chlorophenol	2.72	0.333	mg/kg wet	3.333		82	30-130	6	30	
2-Methylnaphthalene	2.60	0.333	mg/kg wet	3.333		78	40-140	5	30	
2-Methylphenol	2.66	0.333	mg/kg wet	3.333		80	30-130	4	30	
2-Nitroaniline	2.64	0.333	mg/kg wet	3.333		79	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
2-Nitrophenol	2.54	0.333	mg/kg wet	3.333		76	30-130	7	30	
3,3´-Dichlorobenzidine	2.64	0.667	mg/kg wet	3.333		79	40-140	6	30	
3+4-Methylphenol	5.85	0.667	mg/kg wet	6.667		88	30-130	5	30	
3-Nitroaniline	2.44	0.333	mg/kg wet	3.333		73	40-140	7	30	
4,6-Dinitro-2-Methylphenol	2.74	1.67	mg/kg wet	3.333		82	30-130	0.9	30	
4-Bromophenyl-phenylether	3.01	0.333	mg/kg wet	3.333		90	40-140	4	30	
4-Chloro-3-Methylphenol	2.73	0.333	mg/kg wet	3.333		82	30-130	4	30	
4-Chloroaniline	2.04	0.667	mg/kg wet	3.333		61	40-140	4	30	
4-Chloro-phenyl-phenyl ether	2.93	0.333	mg/kg wet	3.333		88	40-140	6	30	
4-Nitroaniline	2.45	0.333	mg/kg wet	3.333		73	40-140	0.2	30	
4-Nitrophenol	2.53	1.67	mg/kg wet	3.333		76	30-130	7	30	
Acenaphthene	2.63	0.333	mg/kg wet	3.333		79	40-140	8	30	
Acenaphthylene	2.31	0.333	mg/kg wet	3.333		69	40-140	5	30	
Acetophenone	2.56	0.667	mg/kg wet	3.333		77	40-140	5	30	
Aniline	2.04	0.667	mg/kg wet	3.333		61	40-140	3	30	
Anthracene	2.62	0.333	mg/kg wet	3.333		79	40-140	1	30	
Azobenzene	2.75	0.333	mg/kg wet	3.333		83	40-140	2	30	
Benzo(a)anthracene	2.73	0.333	mg/kg wet	3.333		82	40-140	5	30	
Benzo(a)pyrene	2.56	0.167	mg/kg wet	3.333		77	40-140	4	30	
Benzo(b)fluoranthene	2.56	0.333	mg/kg wet	3.333		77	40-140	3	30	
Benzo(g,h,i)perylene	2.73	0.333	mg/kg wet	3.333		82	40-140	6	30	
Benzo(k)fluoranthene	2.82	0.333	mg/kg wet	3.333		84	40-140	7	30	
Benzoic Acid	2.56	1.67	mg/kg wet	3.333		77	40-140	10	30	
Benzyl Alcohol	2.38	0.333	mg/kg wet	3.333		71	40-140	3	30	
bis(2-Chloroethoxy)methane	2.70	0.333	mg/kg wet	3.333		81	40-140	6	30	
bis(2-Chloroethyl)ether	2.71	0.333	mg/kg wet	3.333		81	40-140	4	30	
bis(2-chloroisopropyl)Ether	2.59	0.333	mg/kg wet	3.333		78	40-140	4	30	
bis(2-Ethylhexyl)phthalate	2.80	0.333	mg/kg wet	3.333		84	40-140	3	30	
Butylbenzylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140	6	30	
Carbazole	2.70	0.333	mg/kg wet	3.333		81	40-140	4	30	
Chrysene	2.67	0.167	mg/kg wet	3.333		80	40-140	3	30	
Dibenzo(a,h)Anthracene	2.74	0.167	mg/kg wet	3.333		82	40-140	5	30	
Dibenzofuran	2.61	0.333	mg/kg wet	3.333		78	40-140	3	30	
Diethylphthalate	2.91	0.333	mg/kg wet	3.333		87	40-140	7	30	
Dimethylphthalate	2.88	0.333	mg/kg wet	3.333		87	40-140	8	30	
Di-n-butylphthalate	3.01	0.333	mg/kg wet	3.333		90	40-140	3	30	
Di-n-octylphthalate	2.80	0.333	mg/kg wet	3.333		84	40-140	5	30	
Fluoranthene	2.70	0.333	mg/kg wet	3.333		81	40-140	2	30	
Fluorene	2.78	0.333	mg/kg wet	3.333		83	40-140	7	30	
Hexachlorobenzene	2.73	0.167	mg/kg wet	3.333		82	40-140	0.9	30	
Hexachlorobutadiene	2.68	0.333	mg/kg wet	3.333		81	40-140	8	30	
Hexachlorocyclopentadiene	1.60	1.67	mg/kg wet	3.333		48	40-140	6	30	
Hexachloroethane	2.37	0.333	mg/kg wet	3.333		71	40-140	5	30	
Indeno(1,2,3-cd)Pyrene	2.71	0.333	mg/kg wet	3.333		81	40-140	5	30	
Isophorone	2.26	0.333	mg/kg wet	3.333		68	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92910 - 3546										
Naphthalene	2.73	0.333	mg/kg wet	3.333		82	40-140	8	30	
Nitrobenzene	2.58	0.333	mg/kg wet	3.333		78	40-140	6	30	
N-Nitrosodimethylamine	2.48	0.333	mg/kg wet	3.333		74	40-140	0.8	30	
N-Nitroso-Di-n-Propylamine	2.76	0.333	mg/kg wet	3.333		83	40-140	5	30	
N-nitrosodiphenylamine	2.78	0.333	mg/kg wet	3.333		83	40-140	1	30	
Pentachlorophenol	2.90	1.67	mg/kg wet	3.333		87	30-130	12	30	
Phenanthrene	2.60	0.333	mg/kg wet	3.333		78	40-140	2	30	
Phenol	2.79	0.333	mg/kg wet	3.333		84	30-130	4	30	
Pyrene	2.65	0.333	mg/kg wet	3.333		80	40-140	4	30	
Pyridine	2.30	1.67	mg/kg wet	3.333		69	40-140	6	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.40*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.79*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.03*		mg/kg wet	*5.000*		*81*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.64*		mg/kg wet	*3.333*		*79*	*30-130*			
Surrogate: 2-Fluorophenol	*4.03*		mg/kg wet	*5.000*		*81*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.84*		mg/kg wet	*3.333*		*85*	*30-130*			
Surrogate: Phenol-d6	*4.20*		mg/kg wet	*5.000*		*84*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.73*		mg/kg wet	*3.333*		*82*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

Notes and Definitions

U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
Q	Calibration required quadratic regression (Q).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0859

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: Client

ESS Project ID: 19H0859
Date Received: 8/27/2019
Project Due Date: 9/4/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 8/27/19 Time: 15:52 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	381745	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	381752	Yes	NA	Yes	VOA Vial - Other	Other	
01	381753	Yes	NA	Yes	VOA Vial - Other	Other	
01	381757	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	381744	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	381750	Yes	NA	Yes	VOA Vial - Other	Other	
02	381751	Yes	NA	Yes	VOA Vial - Other	Other	
02	381756	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	381743	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	381748	Yes	NA	Yes	VOA Vial - Other	Other	
03	381749	Yes	NA	Yes	VOA Vial - Other	Other	
03	381755	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	381742	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	381746	Yes	NA	Yes	VOA Vial - Other	Other	
04	381747	Yes	NA	Yes	VOA Vial - Other	Other	
04	381754	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

ESS Project ID: 19H0859
Date Received: 8/27/2019

Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 8/27/19 1545

Reviewed By: _____ Date & Time: 8/27/19 15:51

Delivered By: _____ 8/27/19 15:51

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 19A0859

Turn Time: 5 Days

Regulatory State: RI

Reporting Limits: RIDEM RAD EC/JCDOC

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Electonic Deliverables: ☒ Data Checker ☒ Excel ☐ Other (Please Specify →)

Company Name: Beta Group

Project #:

Project Name: NBC IIIA-4 and IIIA-5

Contact Person: Joe McLoughlin

Address: 701 Grove Washington Hwy

City: Lincoln

State: RI

Zip Code: 02865

PO #:

Telephone Number: 401.333.2382

FAX Number:

Email Address: jmcloughlin@beta-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	PCBs	TPH	PR-13 metals
1	8/27/19	9:00	Grab	Soil	B-5 0-2'	X	X	X	X	X
2		9:15			B-5 2-4'	X	X	X	X	X
3		9:30			B-5 4-6'	X	X	X	X	X
4		9:45	Comp		B-5 6-10'	X	X	X	X	X

Container Type: AC-Air Cassette, AG-Amber Glass, B-BOD Bottle, C-Cubitainer, J-Jar, O-Other, P-Poly, S-Sterile, V-Vial

Container Volume: 1-100 mL, 2-2.5 gal, 3-250 mL, 4-300 mL, 5-500 mL, 6-1L, 7-VOA, 8-2 oz, 9-4 oz, 10-8 oz, 11-Other*

Preservation Code: 1-Non Preserved, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-Methanol, 7-Na2S2O3, 8-ZnAce, NaOH, 9-NH4Cl, 10-DI H2O, 11-Other*

Analysis	VOCs	SVOCs	PCBs	TPH	PR-13 metals
Container Type	V	AG	AG	AG	AG
Container Volume	7				
Preservation Code	6/10	1	1	1	1
Number of Containers per Sample	3	1	1	1	1

Sampled by: Scott Nee

Comments: Please specify "Other" preservative and containers types in this space

Laboratory Use Only

Cooler Present: Y 3.4 ☒ Drop Off

Seals Intact: ○ Pickup

Cooler Temperature: °C

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
8/27/19 3:21	8/27/19 1521		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (N/A)
ESS Laboratory Work Order Number: 19H0974

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:29 pm, Sep 09, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

SAMPLE RECEIPT

The following samples were received on August 29, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 8/29/19 at 17:01.

Lab Number	Sample Name	Matrix	Analysis
19H0974-01	B-6 0-2ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0974-02	B-6 2-4ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

PROJECT NARRATIVE

8270D Semi-Volatile Organic Compounds

C9H0626-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (106% @ 80-120%), 4,6-Dinitro-2-Methylphenol (104% @ 80-120%), Benzoic Acid (102% @ 80-120%)

C9H0626-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2-Methylnaphthalene (23% @ 20%)

C9H0626-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Aniline (23% @ 20%), Hexachlorocyclopentadiene (27% @ 20%), Isophorone (21% @ 20%)

C9I0054-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (101% @ 80-120%), 4,6-Dinitro-2-Methylphenol (96% @ 80-120%), Benzoic Acid (95% @ 80-120%), Di-n-octylphthalate (110% @ 80-120%), Pentachlorophenol (94% @ 80-120%)

CH93011-BS1 **Blank Spike recovery is below lower control limit (B-).**
Aniline (39% @ 40-140%), Hexachlorocyclopentadiene (38% @ 40-140%)

CH93011-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Aniline (39% @ 40-140%), Hexachlorocyclopentadiene (38% @ 40-140%), N-Nitrosodimethylamine (38% @ 40-140%), Pyridine (39% @ 40-140%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (1.97)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Arsenic	**4.89** (0.99)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Beryllium	**0.28** (0.04)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Cadmium	ND (0.20)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Chromium	**8.99** (0.39)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Copper	**25.5** (0.99)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Lead	**51.6** (1.97)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Mercury	**0.102** (0.010)		7471B		1	MKS	09/05/19 13:10	2.33	40	CI90447
Nickel	**8.26** (0.99)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Selenium	ND (1.97)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Silver	ND (0.20)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446
Thallium	ND (0.20)		6020A		1	NAR	09/06/19 12:46	5.87	100	CI90446
Zinc	**44.4** (0.99)		6010C		1	KJK	09/05/19 16:45	5.87	100	CI90446

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,1,1-Trichloroethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,1,2,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,1,2-Trichloroethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,1-Dichloroethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,1-Dichloroethene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,1-Dichloropropene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2,3-Trichlorobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2,3-Trichloropropane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2,4-Trichlorobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2,4-Trimethylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2-Dibromo-3-Chloropropane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2-Dibromoethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2-Dichlorobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2-Dichloroethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,2-Dichloropropane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,3,5-Trimethylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,3-Dichlorobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,3-Dichloropropane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,4-Dichlorobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1,4-Dioxane	ND (0.0772)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
1-Chlorohexane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
2,2-Dichloropropane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
2-Butanone	ND (0.0386)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
2-Chlorotoluene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
2-Hexanone	ND (0.0386)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
4-Chlorotoluene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
4-Isopropyltoluene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
4-Methyl-2-Pentanone	ND (0.0386)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Acetone	ND (0.0386)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Benzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Bromobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Bromodichloromethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Bromoform	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Bromomethane	ND (0.0077)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Carbon Disulfide	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Carbon Tetrachloride	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Chlorobenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Chloroethane	ND (0.0077)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Chloroform	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Chloromethane	ND (0.0077)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
cis-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
cis-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Dibromochloromethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Dibromomethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Dichlorodifluoromethane	ND (0.0077)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Diethyl Ether	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Di-isopropyl ether	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Ethyl tertiary-butyl ether	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Ethylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Hexachlorobutadiene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Isopropylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Methyl tert-Butyl Ether	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Methylene Chloride	ND (0.0193)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Naphthalene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
n-Butylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
n-Propylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
sec-Butylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Styrene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
tert-Butylbenzene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Tertiary-amyl methyl ether	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Tetrachloroethene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Tetrahydrofuran	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
trans-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
trans-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Trichloroethene	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Trichlorofluoromethane	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Vinyl Acetate	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Vinyl Chloride	ND (0.0077)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Xylene O	ND (0.0039)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Xylene P,M	ND (0.0077)		8260B Low		1	08/30/19 14:20	C9H0629	CH93021
Xylenes (Total)	ND (0.00772)		8260B Low		1	08/30/19 14:20		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*93 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*82 %*		*70-130*
Surrogate: Dibromofluoromethane	*95 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 20.9
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/30/19 15:51

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1221	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1232	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1242	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1248	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1254	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1260	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1262	ND (0.06)		8082A		1	09/03/19 13:48		CH93007
Aroclor 1268	ND (0.06)		8082A		1	09/03/19 13:48		CH93007

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*67 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*65 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*58 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*64 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 20
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/30/19 10:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**390** (86.9)		8100M		2	08/31/19 1:11	C9H0564	CH93012

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*92 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 10:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
1,2,4-Trichlorobenzene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
1,2-Dichlorobenzene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
1,3-Dichlorobenzene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
1,4-Dichlorobenzene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,3,4,6-Tetrachlorophenol	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,4,5-Trichlorophenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,4,6-Trichlorophenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,4-Dichlorophenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,4-Dimethylphenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,4-Dinitrophenol	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,4-Dinitrotoluene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2,6-Dinitrotoluene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2-Chloronaphthalene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2-Chlorophenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2-Methylnaphthalene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2-Methylphenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2-Nitroaniline	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
2-Nitrophenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
3,3´-Dichlorobenzidine	ND (0.762)		8270D		1	09/05/19 15:10	C9I0054	CH93011
3+4-Methylphenol	ND (0.762)		8270D		1	09/05/19 15:10	C9I0054	CH93011
3-Nitroaniline	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4,6-Dinitro-2-Methylphenol	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4-Bromophenyl-phenylether	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4-Chloro-3-Methylphenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4-Chloroaniline	ND (0.762)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4-Chloro-phenyl-phenyl ether	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4-Nitroaniline	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
4-Nitrophenol	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Acenaphthene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Acenaphthylene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Acetophenone	ND (0.762)		8270D		1	09/05/19 15:10	C9I0054	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 10:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.762)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Anthracene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Azobenzene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzo(a)anthracene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzo(a)pyrene	**0.250** (0.191)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzo(b)fluoranthene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzo(g,h,i)perylene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzo(k)fluoranthene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzoic Acid	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Benzyl Alcohol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
bis(2-Chloroethoxy)methane	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
bis(2-Chloroethyl)ether	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
bis(2-chloroisopropyl)Ether	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
bis(2-Ethylhexyl)phthalate	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Butylbenzylphthalate	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Carbazole	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Chrysene	**0.230** (0.191)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Dibenzo(a,h)Anthracene	ND (0.191)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Dibenzofuran	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Diethylphthalate	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Dimethylphthalate	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Di-n-butylphthalate	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Di-n-octylphthalate	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Fluoranthene	**0.468** (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Fluorene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Hexachlorobenzene	ND (0.191)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Hexachlorobutadiene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Hexachlorocyclopentadiene	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Hexachloroethane	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Indeno(1,2,3-cd)Pyrene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Isophorone	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Naphthalene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 0-2ft
Date Sampled: 08/29/19 08:10
Percent Solids: 86
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 10:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
N-Nitrosodimethylamine	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
N-Nitroso-Di-n-Propylamine	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
N-nitrosodiphenylamine	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Pentachlorophenol	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Phenanthrene	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Phenol	ND (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Pyrene	**0.424** (0.381)		8270D		1	09/05/19 15:10	C9I0054	CH93011
Pyridine	ND (1.91)		8270D		1	09/05/19 15:10	C9I0054	CH93011

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*49 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*70 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*58 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*57 %*		*30-130*
Surrogate: 2-Fluorophenol	*57 %*		*30-130*
Surrogate: Nitrobenzene-d5	*52 %*		*30-130*
Surrogate: Phenol-d6	*60 %*		*30-130*
Surrogate: p-Terphenyl-d14	*71 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.20)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Arsenic	**6.57** (2.60)		6010C		1	KJK	09/06/19 8:56	2.16	100	CI90446
Beryllium	**0.32** (0.11)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Cadmium	ND (0.52)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Chromium	**10.8** (1.04)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Copper	**25.7** (2.60)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Lead	**51.4** (5.20)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Mercury	**0.191** (0.025)		7471B		1	MKS	09/05/19 13:16	0.9	40	CI90447
Nickel	**9.12** (2.60)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Selenium	ND (5.20)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Silver	ND (0.52)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446
Thallium	ND (0.52)		6020A		1	NAR	09/06/19 12:50	2.16	100	CI90446
Zinc	**48.1** (2.60)		6010C		1	KJK	09/05/19 16:48	2.16	100	CI90446

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 6.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1,4-Dioxane	ND (0.0814)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
1-Chlorohexane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
2-Butanone	ND (0.0407)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
2-Chlorotoluene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
2-Hexanone	ND (0.0407)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
4-Chlorotoluene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
4-Methyl-2-Pentanone	ND (0.0407)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Acetone	**0.0513** (0.0407)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Benzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Bromobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 6.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Bromodichloromethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Bromoform	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Bromomethane	ND (0.0081)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Carbon Disulfide	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Chlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Chloroethane	ND (0.0081)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Chloroform	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Chloromethane	ND (0.0081)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Dibromochloromethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Dibromomethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Diethyl Ether	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Di-isopropyl ether	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Ethylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Isopropylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Methylene Chloride	ND (0.0203)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Naphthalene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
n-Butylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
n-Propylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
sec-Butylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Styrene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
tert-Butylbenzene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Tetrachloroethene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Tetrahydrofuran	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 6.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Trichloroethene	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Vinyl Acetate	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Vinyl Chloride	ND (0.0081)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Xylene O	ND (0.0041)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Xylene P,M	ND (0.0081)		8260B Low		1	08/30/19 14:45	C9H0629	CH93021
Xylenes (Total)	ND (0.00814)		8260B Low		1	08/30/19 14:45		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*89 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*82 %*		*70-130*
Surrogate: Dibromofluoromethane	*93 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 19.9
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/30/19 15:51

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1221	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1232	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1242	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1248	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1254	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1260	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1262	ND (0.06)		8082A		1	09/03/19 14:08		CH93007
Aroclor 1268	ND (0.06)		8082A		1	09/03/19 14:08		CH93007

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*66 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*64 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*62 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*69 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 19.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/30/19 10:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**205** (87.3)		8100M		2	08/31/19 1:43	C9H0564	CH93012

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*94 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 10:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
1,2,4-Trichlorobenzene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
1,2-Dichlorobenzene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
1,3-Dichlorobenzene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
1,4-Dichlorobenzene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,3,4,6-Tetrachlorophenol	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,4,5-Trichlorophenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,4,6-Trichlorophenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,4-Dichlorophenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,4-Dimethylphenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,4-Dinitrophenol	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,4-Dinitrotoluene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2,6-Dinitrotoluene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2-Chloronaphthalene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2-Chlorophenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2-Methylnaphthalene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2-Methylphenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2-Nitroaniline	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
2-Nitrophenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
3,3´-Dichlorobenzidine	ND (0.739)		8270D		1	09/05/19 15:36	C9I0054	CH93011
3+4-Methylphenol	ND (0.739)		8270D		1	09/05/19 15:36	C9I0054	CH93011
3-Nitroaniline	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4,6-Dinitro-2-Methylphenol	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4-Bromophenyl-phenylether	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4-Chloro-3-Methylphenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4-Chloroaniline	ND (0.739)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4-Chloro-phenyl-phenyl ether	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4-Nitroaniline	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
4-Nitrophenol	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Acenaphthene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Acenaphthylene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Acetophenone	ND (0.739)		8270D		1	09/05/19 15:36	C9I0054	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 10:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.739)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Anthracene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Azobenzene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzo(a)anthracene	**0.370** (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzo(a)pyrene	**0.331** (0.185)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzo(b)fluoranthene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzo(g,h,i)perylene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzo(k)fluoranthene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzoic Acid	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Benzyl Alcohol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
bis(2-Chloroethoxy)methane	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
bis(2-Chloroethyl)ether	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
bis(2-chloroisopropyl)Ether	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
bis(2-Ethylhexyl)phthalate	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Butylbenzylphthalate	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Carbazole	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Chrysene	**0.337** (0.185)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Dibenzo(a,h)Anthracene	ND (0.185)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Dibenzofuran	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Diethylphthalate	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Dimethylphthalate	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Di-n-butylphthalate	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Di-n-octylphthalate	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Fluoranthene	**0.665** (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Fluorene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Hexachlorobenzene	ND (0.185)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Hexachlorobutadiene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Hexachlorocyclopentadiene	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Hexachloroethane	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Indeno(1,2,3-cd)Pyrene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Isophorone	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Naphthalene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6 2-4ft
Date Sampled: 08/29/19 08:20
Percent Solids: 89
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0974
ESS Laboratory Sample ID: 19H0974-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 10:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
N-Nitrosodimethylamine	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
N-Nitroso-Di-n-Propylamine	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
N-nitrosodiphenylamine	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Pentachlorophenol	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Phenanthrene	**0.376** (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Phenol	ND (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Pyrene	**0.593** (0.369)		8270D		1	09/05/19 15:36	C9I0054	CH93011
Pyridine	ND (1.85)		8270D		1	09/05/19 15:36	C9I0054	CH93011

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*46 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*67 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*56 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*51 %*		*30-130*
Surrogate: 2-Fluorophenol	*54 %*		*30-130*
Surrogate: Nitrobenzene-d5	*47 %*		*30-130*
Surrogate: Phenol-d6	*59 %*		*30-130*
Surrogate: p-Terphenyl-d14	*70 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI90446 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	44.3	17.5	mg/kg wet	42.40		105	80-120			
Arsenic	125	8.77	mg/kg wet	128.0		98	80-120			
Beryllium	217	0.39	mg/kg wet	217.0		100	80-120			
Cadmium	98.1	1.75	mg/kg wet	99.00		99	80-120			
Chromium	116	3.51	mg/kg wet	116.0		100	80-120			
Copper	88.9	8.77	mg/kg wet	89.60		99	80-120			
Lead	280	17.5	mg/kg wet	277.0		101	80-120			
Nickel	106	8.77	mg/kg wet	107.0		99	80-120			
Selenium	238	17.5	mg/kg wet	242.0		98	80-120			
Silver	64.8	1.75	mg/kg wet	64.30		101	80-120			
Zinc	553	8.77	mg/kg wet	561.0		99	80-120			
LCS										
Thallium	179	8.77	mg/kg wet	183.0		98	80-120			
LCS Dup										
Antimony	45.8	19.2	mg/kg wet	42.40		108	80-120	3	20	
Arsenic	125	9.62	mg/kg wet	128.0		98	80-120	0.05	20	
Beryllium	218	0.42	mg/kg wet	217.0		100	80-120	0.2	20	
Cadmium	99.1	1.92	mg/kg wet	99.00		100	80-120	1	20	
Chromium	116	3.85	mg/kg wet	116.0		100	80-120	0.3	20	
Copper	88.6	9.62	mg/kg wet	89.60		99	80-120	0.4	20	
Lead	290	19.2	mg/kg wet	277.0		105	80-120	3	20	
Nickel	106	9.62	mg/kg wet	107.0		99	80-120	0.3	20	
Selenium	240	19.2	mg/kg wet	242.0		99	80-120	1	20	
Silver	64.4	1.92	mg/kg wet	64.30		100	80-120	0.6	20	
Zinc	552	9.62	mg/kg wet	561.0		98	80-120	0.2	20	
LCS Dup										
Thallium	195	9.62	mg/kg wet	183.0		107	80-120	9	30	
Batch CI90447 - 7471B										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI90447 - 7471B										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	24.4	3.60	mg/kg wet	27.30		90	80-120			
LCS Dup										
Mercury	23.3	3.74	mg/kg wet	27.30		85	80-120	5	20	
Reference										
Mercury	0.978	0.174	mg/kg wet	1000		0.1	0-200			
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93021 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93021 - 5035										
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0445*		mg/kg wet	*0.05000*		*89*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0440*		mg/kg wet	*0.05000*		*88*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0459*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0467*		mg/kg wet	*0.05000*		*93*	*70-130*			
LCS										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93021 - 5035										
1,1,1,2-Tetrachloroethane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
1,1,1-Trichloroethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
1,1,2,2-Tetrachloroethane	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
1,1,2-Trichloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,1-Dichloroethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloroethene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
1,1-Dichloropropene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,3-Trichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,2,3-Trichloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,2,4-Trichlorobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,4-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dibromo-3-Chloropropane	0.0390	0.0050	mg/kg wet	0.05000		78	70-130			
1,2-Dibromoethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dichloroethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
1,2-Dichloropropane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,3,5-Trimethylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,3-Dichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,3-Dichloropropane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
1,4-Dioxane	0.910	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
2,2-Dichloropropane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
2-Butanone	0.234	0.0500	mg/kg wet	0.2500		94	70-130			
2-Chlorotoluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
2-Hexanone	0.194	0.0500	mg/kg wet	0.2500		78	70-130			
4-Chlorotoluene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
4-Isopropyltoluene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
4-Methyl-2-Pentanone	0.201	0.0500	mg/kg wet	0.2500		80	70-130			
Acetone	0.200	0.0500	mg/kg wet	0.2500		80	70-130			
Benzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Bromobenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Bromochloromethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Bromodichloromethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Bromoform	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Bromomethane	0.0491	0.0100	mg/kg wet	0.05000		98	70-130			
Carbon Disulfide	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Carbon Tetrachloride	0.0570	0.0050	mg/kg wet	0.05000		114	70-130			
Chlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Chloroethane	0.0443	0.0100	mg/kg wet	0.05000		89	70-130			
Chloroform	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Chloromethane	0.0477	0.0100	mg/kg wet	0.05000		95	70-130			
cis-1,2-Dichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
cis-1,3-Dichloropropene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Dibromochloromethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93021 - 5035										
Dibromomethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Dichlorodifluoromethane	0.0379	0.0100	mg/kg wet	0.05000		76	70-130			
Diethyl Ether	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Di-isopropyl ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Ethyl tertiary-butyl ether	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Ethylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Hexachlorobutadiene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
Isopropylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Methyl tert-Butyl Ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Methylene Chloride	0.0445	0.0250	mg/kg wet	0.05000		89	70-130			
Naphthalene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
n-Butylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
n-Propylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
sec-Butylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Styrene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
tert-Butylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Tertiary-amyl methyl ether	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Tetrachloroethene	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
Tetrahydrofuran	0.0360	0.0050	mg/kg wet	0.05000		72	70-130			
Toluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,2-Dichloroethene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
trans-1,3-Dichloropropene	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
Trichloroethene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Trichlorofluoromethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
Vinyl Acetate	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Chloride	0.0522	0.0100	mg/kg wet	0.05000		104	70-130			
Xylene O	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Xylene P,M	0.111	0.0100	mg/kg wet	0.1000		111	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0410*		mg/kg wet	*0.05000*		*82*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0459*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0459*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0460*		mg/kg wet	*0.05000*		*92*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
1,1,1-Trichloroethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	6	25	
1,1,2,2-Tetrachloroethane	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	0.5	25	
1,1,2-Trichloroethane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	0.3	25	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,1-Dichloroethene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	3	25	
1,1-Dichloropropene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,2,3-Trichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,2,3-Trichloropropane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	1	25	
1,2,4-Trichlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
1,2,4-Trimethylbenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
1,2-Dibromo-3-Chloropropane	0.0384	0.0050	mg/kg wet	0.05000		77	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93021 - 5035										
1,2-Dibromoethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	0.8	25	
1,2-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,2-Dichloroethane	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	3	25	
1,2-Dichloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
1,3,5-Trimethylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,3-Dichloropropane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.7	25	
1,4-Dichlorobenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
1,4-Dioxane	0.893	0.100	mg/kg wet	1.000		89	70-130	2	20	
1-Chlorohexane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
2,2-Dichloropropane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	6	25	
2-Butanone	0.232	0.0500	mg/kg wet	0.2500		93	70-130	0.6	25	
2-Chlorotoluene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
2-Hexanone	0.200	0.0500	mg/kg wet	0.2500		80	70-130	3	25	
4-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
4-Isopropyltoluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
4-Methyl-2-Pentanone	0.204	0.0500	mg/kg wet	0.2500		81	70-130	1	25	
Acetone	0.198	0.0500	mg/kg wet	0.2500		79	70-130	0.9	25	
Benzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Bromobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Bromochloromethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Bromodichloromethane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
Bromoform	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	0.4	25	
Bromomethane	0.0463	0.0100	mg/kg wet	0.05000		93	70-130	6	25	
Carbon Disulfide	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Carbon Tetrachloride	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	6	25	
Chlorobenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Chloroethane	0.0421	0.0100	mg/kg wet	0.05000		84	70-130	5	25	
Chloroform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Chloromethane	0.0450	0.0100	mg/kg wet	0.05000		90	70-130	6	25	
cis-1,2-Dichloroethene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
cis-1,3-Dichloropropene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Dibromochloromethane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	0.7	25	
Dibromomethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	4	25	
Dichlorodifluoromethane	0.0359	0.0100	mg/kg wet	0.05000		72	70-130	5	25	
Diethyl Ether	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	0.3	25	
Di-isopropyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
Ethyl tertiary-butyl ether	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	0.8	25	
Ethylbenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Hexachlorobutadiene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Isopropylbenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Methyl tert-Butyl Ether	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	0.2	25	
Methylene Chloride	0.0436	0.0250	mg/kg wet	0.05000		87	70-130	2	25	
Naphthalene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	0.4	25	
n-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	5	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93021 - 5035										
n-Propylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
sec-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Styrene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
tert-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Tertiary-amyl methyl ether	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	0.04	25	
Tetrachloroethene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
Tetrahydrofuran	0.0385	0.0050	mg/kg wet	0.05000		77	70-130	7	25	
Toluene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
trans-1,2-Dichloroethene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
trans-1,3-Dichloropropene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	1	25	
Trichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Trichlorofluoromethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
Vinyl Acetate	0.0393	0.0050	mg/kg wet	0.05000		79	70-130	0.5	25	
Vinyl Chloride	0.0492	0.0100	mg/kg wet	0.05000		98	70-130	6	25	
Xylene O	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130	3	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0399*		mg/kg wet	*0.05000*		*80*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0457*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0455*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Toluene-d8	*0.0469*		mg/kg wet	*0.05000*		*94*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CH93007 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							
Aroclor 1268	ND	0.02	mg/kg wet							
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0222*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0217*		mg/kg wet	*0.02500*		*87*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CH93007 - 3540C										
Surrogate: Tetrachloro-m-xylene	*0.0190*		mg/kg wet	*0.02500*		*76*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0194*		mg/kg wet	*0.02500*		*78*	*30-150*			
LCS										
Aroclor 1016	0.4	0.02	mg/kg wet	0.5000		86	40-140			
Aroclor 1016 [2C]	0.4	0.02	mg/kg wet	0.5000		85	40-140			
Aroclor 1260	0.4	0.02	mg/kg wet	0.5000		82	40-140			
Aroclor 1260 [2C]	0.4	0.02	mg/kg wet	0.5000		81	40-140			
Surrogate: Decachlorobiphenyl	*0.0203*		mg/kg wet	*0.02500*		*81*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0199*		mg/kg wet	*0.02500*		*79*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0175*		mg/kg wet	*0.02500*		*70*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0170*		mg/kg wet	*0.02500*		*68*	*30-150*			
LCS Dup										
Aroclor 1016	0.4	0.02	mg/kg wet	0.5000		85	40-140	0.4	30	
Aroclor 1016 [2C]	0.4	0.02	mg/kg wet	0.5000		85	40-140	0.7	30	
Aroclor 1260	0.4	0.02	mg/kg wet	0.5000		82	40-140	0.1	30	
Aroclor 1260 [2C]	0.4	0.02	mg/kg wet	0.5000		79	40-140	2	30	
Surrogate: Decachlorobiphenyl	*0.0207*		mg/kg wet	*0.02500*		*83*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0203*		mg/kg wet	*0.02500*		*81*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0177*		mg/kg wet	*0.02500*		*71*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0172*		mg/kg wet	*0.02500*		*69*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CH93012 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.66*		mg/kg wet	*5.000*		*93*	*40-140*			
LCS										
Decane (C10)	2.0	0.2	mg/kg wet	2.500		81	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CH93012 - 3546										
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		102	40-140			
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Eicosane (C20)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		98	40-140			
Hexadecane (C16)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		106	40-140			
Nonane (C9)	1.8	0.2	mg/kg wet	2.500		74	30-140			
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Octadecane (C18)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Total Petroleum Hydrocarbons	32.4	37.5	mg/kg wet	35.00		93	40-140			
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Surrogate: O-Terphenyl	*4.98*		mg/kg wet	*5.000*		*100*	*40-140*			
LCS Dup										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		71	40-140	14	25	
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		88	40-140	14	25	
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		77	40-140	12	25	
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		87	40-140	15	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		85	40-140	14	25	
Hexadecane (C16)	2.1	0.2	mg/kg wet	2.500		84	40-140	14	25	
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		92	40-140	14	25	
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		64	30-140	14	25	
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		83	40-140	14	25	
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		88	40-140	14	25	
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		87	40-140	14	25	
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		81	40-140	13	25	
Total Petroleum Hydrocarbons	28.2	37.5	mg/kg wet	35.00		81	40-140	14	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		80	40-140	13	25	
Surrogate: O-Terphenyl	*4.30*		mg/kg wet	*5.000*		*86*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Blank										
1,1-Biphenyl	ND	0.100	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.167	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.167	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.167	mg/kg wet							
Benzo(a)pyrene	ND	0.067	mg/kg wet							
Benzo(b)fluoranthene	ND	0.167	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.100	mg/kg wet							
Benzo(k)fluoranthene	ND	0.167	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.100	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.067	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.067	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.067	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.167	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.083	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*1.99*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.55*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.17*		mg/kg wet	*5.000*		*63*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.27*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2-Fluorophenol	*2.98*		mg/kg wet	*5.000*		*60*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.08*		mg/kg wet	*3.333*		*62*	*30-130*			
Surrogate: Phenol-d6	*2.90*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.89*		mg/kg wet	*3.333*		*87*	*30-130*			
LCS										
1,1-Biphenyl	2.18	0.100	mg/kg wet	3.333		66	40-140			
1,2,4-Trichlorobenzene	2.21	0.333	mg/kg wet	3.333		66	40-140			
1,2-Dichlorobenzene	1.98	0.333	mg/kg wet	3.333		59	40-140			
1,3-Dichlorobenzene	1.88	0.333	mg/kg wet	3.333		56	40-140			
1,4-Dichlorobenzene	1.87	0.333	mg/kg wet	3.333		56	40-140			
2,3,4,6-Tetrachlorophenol	2.95	1.67	mg/kg wet	3.333		88	30-130			
2,4,5-Trichlorophenol	2.86	0.333	mg/kg wet	3.333		86	30-130			
2,4,6-Trichlorophenol	2.56	0.333	mg/kg wet	3.333		77	30-130			
2,4-Dichlorophenol	2.43	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dimethylphenol	2.10	0.333	mg/kg wet	3.333		63	30-130			
2,4-Dinitrophenol	2.79	1.67	mg/kg wet	3.333		84	30-130			
2,4-Dinitrotoluene	2.76	0.167	mg/kg wet	3.333		83	40-140			
2,6-Dinitrotoluene	2.78	0.333	mg/kg wet	3.333		83	40-140			
2-Chloronaphthalene	2.16	0.333	mg/kg wet	3.333		65	40-140			
2-Chlorophenol	1.90	0.333	mg/kg wet	3.333		57	30-130			
2-Methylnaphthalene	2.24	0.333	mg/kg wet	3.333		67	40-140			
2-Methylphenol	1.93	0.333	mg/kg wet	3.333		58	30-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
2-Nitroaniline	1.88	0.333	mg/kg wet	3.333		56	40-140			
2-Nitrophenol	1.99	0.333	mg/kg wet	3.333		60	30-130			
3,3´-Dichlorobenzidine	2.86	0.167	mg/kg wet	3.333		86	40-140			
3+4-Methylphenol	4.34	0.667	mg/kg wet	6.667		65	30-130			
3-Nitroaniline	2.31	0.333	mg/kg wet	3.333		69	40-140			
4,6-Dinitro-2-Methylphenol	2.83	1.67	mg/kg wet	3.333		85	30-130			
4-Bromophenyl-phenylether	3.15	0.333	mg/kg wet	3.333		95	40-140			
4-Chloro-3-Methylphenol	2.59	0.333	mg/kg wet	3.333		78	30-130			
4-Chloroaniline	1.66	0.667	mg/kg wet	3.333		50	40-140			
4-Chloro-phenyl-phenyl ether	2.85	0.333	mg/kg wet	3.333		85	40-140			
4-Nitroaniline	2.39	0.333	mg/kg wet	3.333		72	40-140			
4-Nitrophenol	1.96	1.67	mg/kg wet	3.333		59	30-130			
Acenaphthene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Acenaphthylene	2.08	0.333	mg/kg wet	3.333		63	40-140			
Acetophenone	1.73	0.667	mg/kg wet	3.333		52	40-140			
Aniline	1.29	0.667	mg/kg wet	3.333		39	40-140			B-
Anthracene	2.67	0.333	mg/kg wet	3.333		80	40-140			
Azobenzene	2.04	0.333	mg/kg wet	3.333		61	40-140			
Benzo(a)anthracene	2.87	0.167	mg/kg wet	3.333		86	40-140			
Benzo(a)pyrene	2.64	0.067	mg/kg wet	3.333		79	40-140			
Benzo(b)fluoranthene	2.63	0.167	mg/kg wet	3.333		79	40-140			
Benzo(g,h,i)perylene	2.80	0.100	mg/kg wet	3.333		84	40-140			
Benzo(k)fluoranthene	2.68	0.167	mg/kg wet	3.333		80	40-140			
Benzoic Acid	2.35	1.67	mg/kg wet	3.333		70	40-140			
Benzyl Alcohol	1.46	0.333	mg/kg wet	3.333		44	40-140			
bis(2-Chloroethoxy)methane	1.76	0.333	mg/kg wet	3.333		53	40-140			
bis(2-Chloroethyl)ether	1.73	0.100	mg/kg wet	3.333		52	40-140			
bis(2-chloroisopropyl)Ether	1.77	0.333	mg/kg wet	3.333		53	40-140			
bis(2-Ethylhexyl)phthalate	2.94	0.333	mg/kg wet	3.333		88	40-140			
Butylbenzylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140			
Carbazole	2.74	0.333	mg/kg wet	3.333		82	40-140			
Chrysene	2.72	0.067	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.72	0.067	mg/kg wet	3.333		82	40-140			
Dibenzofuran	2.46	0.333	mg/kg wet	3.333		74	40-140			
Diethylphthalate	2.81	0.333	mg/kg wet	3.333		84	40-140			
Dimethylphthalate	2.82	0.333	mg/kg wet	3.333		85	40-140			
Di-n-butylphthalate	3.15	0.333	mg/kg wet	3.333		94	40-140			
Di-n-octylphthalate	2.92	0.333	mg/kg wet	3.333		88	40-140			
Fluoranthene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Fluorene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Hexachlorobenzene	3.17	0.067	mg/kg wet	3.333		95	40-140			
Hexachlorobutadiene	2.21	0.333	mg/kg wet	3.333		66	40-140			
Hexachlorocyclopentadiene	1.28	1.67	mg/kg wet	3.333		38	40-140			B-
Hexachloroethane	1.63	0.333	mg/kg wet	3.333		49	40-140			
Indeno(1,2,3-cd)Pyrene	2.70	0.167	mg/kg wet	3.333		81	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Isophorone	1.54	0.333	mg/kg wet	3.333		46	40-140			
Naphthalene	2.00	0.083	mg/kg wet	3.333		60	40-140			
Nitrobenzene	1.60	0.333	mg/kg wet	3.333		48	40-140			
N-Nitrosodimethylamine	1.64	0.333	mg/kg wet	3.333		49	40-140			
N-Nitroso-Di-n-Propylamine	1.64	0.333	mg/kg wet	3.333		49	40-140			
N-nitrosodiphenylamine	2.79	0.333	mg/kg wet	3.333		84	40-140			
Pentachlorophenol	3.18	0.333	mg/kg wet	3.333		95	30-130			
Phenanthrene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Phenol	1.80	0.333	mg/kg wet	3.333		54	30-130			
Pyrene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Pyridine	1.61	1.67	mg/kg wet	3.333		48	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.81*		mg/kg wet	*3.333*		*54*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.62*		mg/kg wet	*5.000*		*92*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*2.95*		mg/kg wet	*5.000*		*59*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.29*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2-Fluorophenol	*2.90*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.78*		mg/kg wet	*3.333*		*53*	*30-130*			
Surrogate: Phenol-d6	*2.80*		mg/kg wet	*5.000*		*56*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.92*		mg/kg wet	*3.333*		*88*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.16	0.100	mg/kg wet	3.333		65	40-140	1	30	
1,2,4-Trichlorobenzene	2.24	0.333	mg/kg wet	3.333		67	40-140	1	30	
1,2-Dichlorobenzene	2.00	0.333	mg/kg wet	3.333		60	40-140	1	30	
1,3-Dichlorobenzene	1.92	0.333	mg/kg wet	3.333		57	40-140	2	30	
1,4-Dichlorobenzene	1.87	0.333	mg/kg wet	3.333		56	40-140	0.03	30	
2,3,4,6-Tetrachlorophenol	2.88	1.67	mg/kg wet	3.333		86	30-130	2	30	
2,4,5-Trichlorophenol	2.77	0.333	mg/kg wet	3.333		83	30-130	3	30	
2,4,6-Trichlorophenol	2.51	0.333	mg/kg wet	3.333		75	30-130	2	30	
2,4-Dichlorophenol	2.39	0.333	mg/kg wet	3.333		72	30-130	1	30	
2,4-Dimethylphenol	2.07	0.333	mg/kg wet	3.333		62	30-130	1	30	
2,4-Dinitrophenol	2.70	1.67	mg/kg wet	3.333		81	30-130	3	30	
2,4-Dinitrotoluene	2.71	0.167	mg/kg wet	3.333		81	40-140	2	30	
2,6-Dinitrotoluene	2.79	0.333	mg/kg wet	3.333		84	40-140	0.2	30	
2-Chloronaphthalene	2.11	0.333	mg/kg wet	3.333		63	40-140	3	30	
2-Chlorophenol	1.98	0.333	mg/kg wet	3.333		59	30-130	4	30	
2-Methylnaphthalene	2.21	0.333	mg/kg wet	3.333		66	40-140	1	30	
2-Methylphenol	1.93	0.333	mg/kg wet	3.333		58	30-130	0.009	30	
2-Nitroaniline	1.87	0.333	mg/kg wet	3.333		56	40-140	0.2	30	
2-Nitrophenol	1.92	0.333	mg/kg wet	3.333		58	30-130	3	30	
3,3´-Dichlorobenzidine	2.72	0.167	mg/kg wet	3.333		82	40-140	5	30	
3+4-Methylphenol	4.39	0.667	mg/kg wet	6.667		66	30-130	1	30	
3-Nitroaniline	2.30	0.333	mg/kg wet	3.333		69	40-140	0.3	30	
4,6-Dinitro-2-Methylphenol	2.75	1.67	mg/kg wet	3.333		83	30-130	3	30	
4-Bromophenyl-phenylether	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
4-Chloro-3-Methylphenol	2.54	0.333	mg/kg wet	3.333		76	30-130	2	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CH93011 - 3546										
4-Chloroaniline	1.65	0.667	mg/kg wet	3.333		49	40-140	0.9	30	
4-Chloro-phenyl-phenyl ether	2.71	0.333	mg/kg wet	3.333		81	40-140	5	30	
4-Nitroaniline	2.37	0.333	mg/kg wet	3.333		71	40-140	1	30	
4-Nitrophenol	1.83	1.67	mg/kg wet	3.333		55	30-130	7	30	
Acenaphthene	2.34	0.333	mg/kg wet	3.333		70	40-140	0.7	30	
Acenaphthylene	2.08	0.333	mg/kg wet	3.333		62	40-140	0.2	30	
Acetophenone	1.77	0.667	mg/kg wet	3.333		53	40-140	2	30	
Aniline	1.30	0.667	mg/kg wet	3.333		39	40-140	0.5	30	B-
Anthracene	2.63	0.333	mg/kg wet	3.333		79	40-140	1	30	
Azobenzene	2.01	0.333	mg/kg wet	3.333		60	40-140	2	30	
Benzo(a)anthracene	2.74	0.167	mg/kg wet	3.333		82	40-140	5	30	
Benzo(a)pyrene	2.57	0.067	mg/kg wet	3.333		77	40-140	3	30	
Benzo(b)fluoranthene	2.50	0.167	mg/kg wet	3.333		75	40-140	5	30	
Benzo(g,h,i)perylene	2.82	0.100	mg/kg wet	3.333		85	40-140	0.8	30	
Benzo(k)fluoranthene	2.71	0.167	mg/kg wet	3.333		81	40-140	1	30	
Benzoic Acid	2.31	1.67	mg/kg wet	3.333		69	40-140	2	30	
Benzyl Alcohol	1.49	0.333	mg/kg wet	3.333		45	40-140	2	30	
bis(2-Chloroethoxy)methane	1.80	0.333	mg/kg wet	3.333		54	40-140	2	30	
bis(2-Chloroethyl)ether	1.79	0.100	mg/kg wet	3.333		54	40-140	4	30	
bis(2-chloroisopropyl)Ether	1.83	0.333	mg/kg wet	3.333		55	40-140	3	30	
bis(2-Ethylhexyl)phthalate	2.70	0.333	mg/kg wet	3.333		81	40-140	8	30	
Butylbenzylphthalate	2.65	0.333	mg/kg wet	3.333		79	40-140	9	30	
Carbazole	2.64	0.333	mg/kg wet	3.333		79	40-140	4	30	
Chrysene	2.68	0.067	mg/kg wet	3.333		81	40-140	1	30	
Dibenzo(a,h)Anthracene	2.77	0.067	mg/kg wet	3.333		83	40-140	2	30	
Dibenzofuran	2.47	0.333	mg/kg wet	3.333		74	40-140	0.1	30	
Diethylphthalate	2.82	0.333	mg/kg wet	3.333		84	40-140	0.2	30	
Dimethylphthalate	2.81	0.333	mg/kg wet	3.333		84	40-140	0.3	30	
Di-n-butylphthalate	2.89	0.333	mg/kg wet	3.333		87	40-140	9	30	
Di-n-octylphthalate	2.72	0.333	mg/kg wet	3.333		82	40-140	7	30	
Fluoranthene	2.85	0.333	mg/kg wet	3.333		85	40-140	6	30	
Fluorene	2.64	0.333	mg/kg wet	3.333		79	40-140	0.2	30	
Hexachlorobenzene	3.07	0.067	mg/kg wet	3.333		92	40-140	3	30	
Hexachlorobutadiene	2.12	0.333	mg/kg wet	3.333		64	40-140	4	30	
Hexachlorocyclopentadiene	1.28	1.67	mg/kg wet	3.333		38	40-140	0.03	30	B-
Hexachloroethane	1.63	0.333	mg/kg wet	3.333		49	40-140	0.3	30	
Indeno(1,2,3-cd)Pyrene	2.76	0.167	mg/kg wet	3.333		83	40-140	2	30	
Isophorone	1.53	0.333	mg/kg wet	3.333		46	40-140	0.4	30	
Naphthalene	2.00	0.083	mg/kg wet	3.333		60	40-140	0.1	30	
Nitrobenzene	1.60	0.333	mg/kg wet	3.333		48	40-140	0.05	30	
N-Nitrosodimethylamine	1.27	0.333	mg/kg wet	3.333		38	40-140	26	30	B-
N-Nitroso-Di-n-Propylamine	1.71	0.333	mg/kg wet	3.333		51	40-140	4	30	
N-nitrosodiphenylamine	2.78	0.333	mg/kg wet	3.333		83	40-140	0.2	30	
Pentachlorophenol	3.13	0.333	mg/kg wet	3.333		94	30-130	2	30	
Phenanthrene	2.63	0.333	mg/kg wet	3.333		79	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Phenol	1.80	0.333	mg/kg wet	3.333		54	30-130	0.3	30	
Pyrene	2.67	0.333	mg/kg wet	3.333		80	40-140	5	30	
Pyridine	1.31	1.67	mg/kg wet	3.333		39	40-140	21	30	B-
Surrogate: 1,2-Dichlorobenzene-d4	*1.79*		mg/kg wet	*3.333*		*54*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.32*		mg/kg wet	*5.000*		*86*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*2.91*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.22*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: 2-Fluorophenol	*3.12*		mg/kg wet	*5.000*		*62*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.72*		mg/kg wet	*3.333*		*52*	*30-130*			
Surrogate: Phenol-d6	*2.75*		mg/kg wet	*5.000*		*55*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.76*		mg/kg wet	*3.333*		*83*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0974

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19H0974
Date Received: 8/29/2019
Project Due Date: 9/6/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 8/29/19 Time: 1701 By: [illegible]

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	382919	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	382922	Yes	NA	Yes	VOA Vial - Other	Other	
01	382923	Yes	NA	Yes	VOA Vial - Other	Other	
01	382925	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	382918	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	382920	Yes	NA	Yes	VOA Vial - Other	Other	
02	382921	Yes	NA	Yes	VOA Vial - Other	Other	
02	382924	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 8/29/19 1656
Reviewed By: Date & Time: 8/29/19 1701
Delivered

ESS Laboratory Sample and Cooler Receipt Checklist

Client:	Beta Engineering - ML/ML	ESS Project ID:	19H0974
		Date Received:	8/29/2019
By:		8/29/19	1701

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 19H0974

Turn Time	5 Days
Regulatory State	RI
Reporting Limits	RDEM RESDEC / ICDEC
Electonic Deliverables	☒ Data Checker ☒ Excel ☐ Other (Please Specify →)

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Company Name	Beta Group
Contact Person	Joe McLaughlin
Project #	
Project Name	NBC IIIA-4 and IIIA-5
Address	701 George Washington Hwy
City	Lincoln
State	RI
Zip Code	02865
PO #	
Telephone Number	401.333.2382
FAX Number	
Email Address	jmclaughlin@beta-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PR-13 Metals
1	8/29/19	8:00	Grab	Soil	B-6 0-2'	X	X	X	X	X
2	8/29/19	8:20	Grab	Soil	B-6 2-4'	X	X	X	X	X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V	AG	AG	AG	AG
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*	7	10	10	10	10
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*	4/10	1	1	1	1
Number of Containers per Sample:												3	1	1	1	1

Laboratory Use Only

Cooler Present: _____ ○ Drop Off
Seals Intact: _____ ◐ Pickup
Cooler Temperature: 1.9 °C ICE RC

Sampled by : Scott Nee

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
8/29/19 2:30	8/29/19 1440	8/29/19 1518	8/29/19 1518
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (N/A)
ESS Laboratory Work Order Number: 19H0896

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:40 pm, Sep 10, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

SAMPLE RECEIPT

The following samples were received on August 28, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 8/28/19 at 15:11.

Lab Number	Sample Name	Matrix	Analysis
19H0896-01	B-4 0-2ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0896-02	B-4 2-4ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0896-03	B-4 4-6ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0896-04	B-4 6-10ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

C9H0615-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Bromomethane (40% @ 30%)

C9H0632-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Chloromethane (32% @ 30%)

CH92956-BSD1 **Blank Spike recovery is above upper control limit (B+).**
Bromomethane (138% @ 70-130%)

CH93024-BS1 **Blank Spike recovery is below lower control limit (B-).**
Chloromethane (68% @ 70-130%), Dichlorodifluoromethane (68% @ 70-130%)

8100M Total Petroleum Hydrocarbons

19H0896-01 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

19H0896-02 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

CH92855-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Decane (C10) (26% @ 25%), Nonane (C9) (27% @ 25%)

8270D Semi-Volatile Organic Compounds

19H0896-02 **Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
Perylene-d12 (48% @ 50-200%)

19H0896-03 **Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
Perylene-d12 (48% @ 50-200%)

19H0896-04 **Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
Perylene-d12 (47% @ 50-200%)

C9H0589-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (101% @ 80-120%), 4,6-Dinitro-2-Methylphenol (109% @ 80-120%), Benzoic Acid (102% @ 80-120%), Pentachlorophenol (117% @ 80-120%)

C9H0589-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexachlorocyclopentadiene (28% @ 20%)

C9H0626-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (106% @ 80-120%), 4,6-Dinitro-2-Methylphenol (104% @ 80-120%), Benzoic Acid (102% @ 80-120%)

C9H0626-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2-Methylnaphthalene (23% @ 20%)

C9H0626-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Aniline (23% @ 20%), Hexachlorocyclopentadiene (27% @ 20%), Isophorone (21% @ 20%)

C9I0030-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (106% @ 80-120%), 4,6-Dinitro-2-Methylphenol (86% @ 80-120%), Benzoic Acid (100% @ 80-120%), Pentachlorophenol (106% @ 80-120%)

C9I0030-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2-Nitroaniline (32% @ 20%), Hexachlorocyclopentadiene (24% @ 20%)

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (3.93)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Arsenic	ND (1.97)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Beryllium	**0.33** (0.09)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Cadmium	ND (0.39)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Chromium	**9.53** (0.79)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Copper	**10.4** (1.97)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Lead	**14.1** (3.93)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Mercury	**0.023** (0.022)		7471B		1	MKS	09/04/19 11:39	0.95	40	CI90360
Nickel	**8.15** (1.97)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Selenium	ND (3.93)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Silver	ND (0.39)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359
Thallium	ND (0.39)		6020A		1	NAR	09/05/19 14:18	2.73	100	CI90359
Zinc	**24.5** (1.97)		6010C		1	KJK	09/04/19 11:02	2.73	100	CI90359

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,1,1-Trichloroethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,1,2,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,1,2-Trichloroethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,1-Dichloroethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,1-Dichloroethene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,1-Dichloropropene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2,3-Trichlorobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2,3-Trichloropropane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2,4-Trichlorobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2,4-Trimethylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2-Dibromo-3-Chloropropane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2-Dibromoethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2-Dichlorobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2-Dichloroethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,2-Dichloropropane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,3,5-Trimethylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,3-Dichlorobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,3-Dichloropropane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,4-Dichlorobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1,4-Dioxane	ND (0.0663)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
1-Chlorohexane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
2,2-Dichloropropane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
2-Butanone	ND (0.0331)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
2-Chlorotoluene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
2-Hexanone	ND (0.0331)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
4-Chlorotoluene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
4-Isopropyltoluene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
4-Methyl-2-Pentanone	ND (0.0331)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Acetone	ND (0.0331)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Benzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Bromobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Bromodichloromethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Bromoform	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Bromomethane	ND (0.0066)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Carbon Disulfide	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Carbon Tetrachloride	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Chlorobenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Chloroethane	ND (0.0066)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Chloroform	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Chloromethane	ND (0.0066)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
cis-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
cis-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Dibromochloromethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Dibromomethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Dichlorodifluoromethane	ND (0.0066)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Diethyl Ether	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Di-isopropyl ether	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Ethyl tertiary-butyl ether	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Ethylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Hexachlorobutadiene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Isopropylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Methyl tert-Butyl Ether	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Methylene Chloride	ND (0.0166)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Naphthalene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
n-Butylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
n-Propylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
sec-Butylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Styrene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
tert-Butylbenzene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Tertiary-amyl methyl ether	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Tetrachloroethene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Tetrahydrofuran	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
trans-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
trans-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Trichloroethene	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Trichlorofluoromethane	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Vinyl Acetate	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Vinyl Chloride	ND (0.0066)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Xylene O	ND (0.0033)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Xylene P,M	ND (0.0066)		8260B Low		1	08/30/19 2:07	C9H0615	CH92956
Xylenes (Total)	ND (0.00663)		8260B Low		1	08/30/19 2:07		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*113 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*80 %*		*70-130*
Surrogate: Dibromofluoromethane	*108 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 19.2
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1221	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1232	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1242	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1248	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1254	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1260	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1262	ND (0.06)		8082A		1	08/29/19 14:50		CH92803
Aroclor 1268	ND (0.06)		8082A		1	08/29/19 14:50		CH92803

	%Recovery	*Qualifier*	*Limits*
Surrogate: Decachlorobiphenyl	*49 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*52 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*62 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*65 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 20.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/28/19 18:30

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**886** (802)		8100M		20	08/30/19 2:09	C9H0605	CH92855

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 14.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
1,2,4-Trichlorobenzene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
1,2-Dichlorobenzene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
1,3-Dichlorobenzene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
1,4-Dichlorobenzene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,3,4,6-Tetrachlorophenol	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,4,5-Trichlorophenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,4,6-Trichlorophenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,4-Dichlorophenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,4-Dimethylphenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,4-Dinitrophenol	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,4-Dinitrotoluene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2,6-Dinitrotoluene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2-Chloronaphthalene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2-Chlorophenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2-Methylnaphthalene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2-Methylphenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2-Nitroaniline	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
2-Nitrophenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
3,3´-Dichlorobenzidine	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
3+4-Methylphenol	ND (1.50)		8270D		1	09/04/19 23:44	C9I0030	CH92856
3-Nitroaniline	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4,6-Dinitro-2-Methylphenol	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4-Bromophenyl-phenylether	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4-Chloro-3-Methylphenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4-Chloroaniline	ND (1.50)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4-Chloro-phenyl-phenyl ether	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4-Nitroaniline	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
4-Nitrophenol	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Acenaphthene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Acenaphthylene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Acetophenone	ND (1.50)		8270D		1	09/04/19 23:44	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 14.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (1.50)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Anthracene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Azobenzene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzo(a)anthracene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzo(a)pyrene	ND (0.376)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzo(b)fluoranthene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzo(g,h,i)perylene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzo(k)fluoranthene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzoic Acid	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Benzyl Alcohol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
bis(2-Chloroethoxy)methane	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
bis(2-Chloroethyl)ether	ND (0.376)		8270D		1	09/04/19 23:44	C9I0030	CH92856
bis(2-chloroisopropyl)Ether	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
bis(2-Ethylhexyl)phthalate	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Butylbenzylphthalate	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Carbazole	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Chrysene	ND (0.376)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Dibenzo(a,h)Anthracene	ND (0.376)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Dibenzofuran	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Diethylphthalate	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Dimethylphthalate	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Di-n-butylphthalate	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Di-n-octylphthalate	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Fluoranthene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Fluorene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Hexachlorobenzene	ND (0.376)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Hexachlorobutadiene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Hexachlorocyclopentadiene	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Hexachloroethane	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Indeno(1,2,3-cd)Pyrene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Isophorone	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Naphthalene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 0-2ft
Date Sampled: 08/28/19 08:30
Percent Solids: 93
Initial Volume: 14.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
N-Nitrosodimethylamine	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
N-Nitroso-Di-n-Propylamine	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
N-nitrosodiphenylamine	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Pentachlorophenol	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Phenanthrene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Phenol	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Pyrene	ND (0.750)		8270D		1	09/04/19 23:44	C9I0030	CH92856
Pyridine	ND (3.76)		8270D		1	09/04/19 23:44	C9I0030	CH92856

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*66 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*84 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*78 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*66 %*		*30-130*
Surrogate: 2-Fluorophenol	*69 %*		*30-130*
Surrogate: Nitrobenzene-d5	*61 %*		*30-130*
Surrogate: Phenol-d6	*74 %*		*30-130*
Surrogate: p-Terphenyl-d14	*82 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.19)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Arsenic	**5.74** (2.59)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Beryllium	**0.27** (0.11)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Cadmium	ND (0.52)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Chromium	**12.8** (1.04)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Copper	**22.2** (2.59)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Lead	**53.2** (5.19)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Mercury	**0.105** (0.021)		7471B		1	MKS	09/04/19 11:41	1.06	40	CI90360
Nickel	**11.5** (2.59)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Selenium	ND (5.19)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Silver	ND (0.52)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359
Thallium	ND (0.52)		6020A		1	NAR	09/05/19 14:23	2.13	100	CI90359
Zinc	**43.9** (2.59)		6010C		1	KJK	09/04/19 11:08	2.13	100	CI90359

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,3-Dichloropropane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1,4-Dioxane	ND (0.0757)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
1-Chlorohexane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
2-Butanone	ND (0.0379)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
2-Chlorotoluene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
2-Hexanone	ND (0.0379)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
4-Chlorotoluene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
4-Isopropyltoluene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
4-Methyl-2-Pentanone	ND (0.0379)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Acetone	ND (0.0379)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Benzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Bromobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Bromodichloromethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Bromoform	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Bromomethane	ND (0.0076)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Carbon Disulfide	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Chlorobenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Chloroethane	ND (0.0076)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Chloroform	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Chloromethane	ND (0.0076)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
cis-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Dibromochloromethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Dibromomethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Dichlorodifluoromethane	ND (0.0076)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Diethyl Ether	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Di-isopropyl ether	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Ethylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Isopropylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Methylene Chloride	ND (0.0189)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Naphthalene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
n-Butylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
n-Propylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
sec-Butylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Styrene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
tert-Butylbenzene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Tetrachloroethene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Tetrahydrofuran	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
trans-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Trichloroethene	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Vinyl Acetate	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Vinyl Chloride	ND (0.0076)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Xylene O	ND (0.0038)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Xylene P,M	ND (0.0076)		8260B Low		1	08/30/19 2:33	C9H0615	CH92956
Xylenes (Total)	ND (0.00757)		8260B Low		1	08/30/19 2:33		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*117 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*79 %*		*70-130*
Surrogate: Dibromofluoromethane	*111 %*		*70-130*
Surrogate: Toluene-d8	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 20.2
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1221	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1232	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1242	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1248	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1254	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1260	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1262	ND (0.05)		8082A		1	08/29/19 15:09		CH92803
Aroclor 1268	ND (0.05)		8082A		1	08/29/19 15:09		CH92803

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*33 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*35 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*39 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*42 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 19.6
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/28/19 18:30

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**1370** (846)		8100M		20	08/30/19 2:45	C9H0605	CH92855

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 15.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
1,2,4-Trichlorobenzene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
1,2-Dichlorobenzene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
1,3-Dichlorobenzene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
1,4-Dichlorobenzene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,3,4,6-Tetrachlorophenol	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,4,5-Trichlorophenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,4,6-Trichlorophenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,4-Dichlorophenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,4-Dimethylphenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,4-Dinitrophenol	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,4-Dinitrotoluene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2,6-Dinitrotoluene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2-Chloronaphthalene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2-Chlorophenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2-Methylnaphthalene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2-Methylphenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2-Nitroaniline	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
2-Nitrophenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
3,3´-Dichlorobenzidine	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
3+4-Methylphenol	ND (1.44)		8270D		1	09/05/19 0:12	C9I0030	CH92856
3-Nitroaniline	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4,6-Dinitro-2-Methylphenol	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4-Bromophenyl-phenylether	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4-Chloro-3-Methylphenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4-Chloroaniline	ND (1.44)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4-Chloro-phenyl-phenyl ether	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4-Nitroaniline	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
4-Nitrophenol	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Acenaphthene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Acenaphthylene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Acetophenone	ND (1.44)		8270D		1	09/05/19 0:12	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 15.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (1.44)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Anthracene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Azobenzene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzo(a)anthracene	**0.800** (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzo(a)pyrene	**0.665** (0.360)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzo(b)fluoranthene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzo(g,h,i)perylene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzo(k)fluoranthene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzoic Acid	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Benzyl Alcohol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
bis(2-Chloroethoxy)methane	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
bis(2-Chloroethyl)ether	ND (0.360)		8270D		1	09/05/19 0:12	C9I0030	CH92856
bis(2-chloroisopropyl)Ether	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
bis(2-Ethylhexyl)phthalate	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Butylbenzylphthalate	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Carbazole	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Chrysene	**0.815** (0.360)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Dibenzo(a,h)Anthracene	ND (0.360)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Dibenzofuran	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Diethylphthalate	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Dimethylphthalate	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Di-n-butylphthalate	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Di-n-octylphthalate	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Fluoranthene	**1.80** (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Fluorene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Hexachlorobenzene	ND (0.360)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Hexachlorobutadiene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Hexachlorocyclopentadiene	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Hexachloroethane	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Indeno(1,2,3-cd)Pyrene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Isophorone	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Naphthalene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 2-4ft
Date Sampled: 08/28/19 08:45
Percent Solids: 90
Initial Volume: 15.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
N-Nitrosodimethylamine	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
N-Nitroso-Di-n-Propylamine	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
N-nitrosodiphenylamine	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Pentachlorophenol	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Phenanthrene	**1.73** (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Phenol	ND (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Pyrene	**1.82** (0.717)		8270D		1	09/05/19 0:12	C9I0030	CH92856
Pyridine	ND (3.60)		8270D		1	09/05/19 0:12	C9I0030	CH92856

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*71 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*88 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*79 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: 2-Fluorophenol	*89 %*		*30-130*
Surrogate: Nitrobenzene-d5	*65 %*		*30-130*
Surrogate: Phenol-d6	*74 %*		*30-130*
Surrogate: p-Terphenyl-d14	*95 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (1.79)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Arsenic	**5.60** (1.79)		6010C		2	KJK	09/05/19 12:25	6.62	100	CI90359
Beryllium	**0.31** (0.04)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Cadmium	ND (0.18)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Chromium	**12.1** (0.36)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Copper	**24.7** (0.90)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Lead	**85.4** (1.79)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Mercury	**0.250** (0.083)		7471B		10	MKS	09/04/19 12:56	2.83	40	CI90360
Nickel	**10.7** (0.90)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359
Selenium	ND (0.18)		6020A		1	NAR	09/05/19 14:28	6.62	100	CI90359
Silver	ND (0.36)		6010C		2	KJK	09/05/19 12:25	6.62	100	CI90359
Thallium	ND (0.18)		6020A		1	NAR	09/05/19 14:28	6.62	100	CI90359
Zinc	**66.8** (0.90)		6010C		1	KJK	09/04/19 11:22	6.62	100	CI90359

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1,4-Dioxane	ND (0.0898)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
1-Chlorohexane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
2-Butanone	ND (0.0449)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
2-Chlorotoluene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
2-Hexanone	ND (0.0449)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
4-Chlorotoluene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
4-Methyl-2-Pentanone	ND (0.0449)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Acetone	ND (0.0449)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Benzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Bromobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Bromodichloromethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Bromoform	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Bromomethane	ND (0.0090)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Carbon Disulfide	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Chlorobenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Chloroethane	ND (0.0090)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Chloroform	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Chloromethane	ND (0.0090)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Dibromochloromethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Dibromomethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Diethyl Ether	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Di-isopropyl ether	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Ethylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Isopropylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Methylene Chloride	ND (0.0225)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Naphthalene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
n-Butylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
n-Propylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
sec-Butylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Styrene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
tert-Butylbenzene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Tetrachloroethene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Tetrahydrofuran	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Trichloroethene	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Vinyl Acetate	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Vinyl Chloride	ND (0.0090)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Xylene O	ND (0.0045)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Xylene P,M	ND (0.0090)		8260B Low		1	08/30/19 2:59	C9H0615	CH92956
Xylenes (Total)	ND (0.00898)		8260B Low		1	08/30/19 2:59		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*86 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*108 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 19.3
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1221	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1232	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1242	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1248	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1254	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1260	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1262	ND (0.06)		8082A		1	08/29/19 15:29		CH92803
Aroclor 1268	ND (0.06)		8082A		1	08/29/19 15:29		CH92803

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*47 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*50 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*58 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*62 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 19.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/28/19 18:30

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**744** (456)		8100M		10	08/30/19 3:21	C9H0605	CH92855

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*66 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 15.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
1,2,4-Trichlorobenzene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
1,2-Dichlorobenzene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
1,3-Dichlorobenzene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
1,4-Dichlorobenzene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,3,4,6-Tetrachlorophenol	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,4,5-Trichlorophenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,4,6-Trichlorophenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,4-Dichlorophenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,4-Dimethylphenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,4-Dinitrophenol	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,4-Dinitrotoluene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2,6-Dinitrotoluene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2-Chloronaphthalene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2-Chlorophenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2-Methylnaphthalene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2-Methylphenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2-Nitroaniline	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
2-Nitrophenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
3,3´-Dichlorobenzidine	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
3+4-Methylphenol	ND (1.51)		8270D		1	09/05/19 0:40	C9I0030	CH92856
3-Nitroaniline	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4,6-Dinitro-2-Methylphenol	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4-Bromophenyl-phenylether	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4-Chloro-3-Methylphenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4-Chloroaniline	ND (1.51)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4-Chloro-phenyl-phenyl ether	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4-Nitroaniline	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
4-Nitrophenol	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Acenaphthene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Acenaphthylene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Acetophenone	ND (1.51)		8270D		1	09/05/19 0:40	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 15.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (1.51)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Anthracene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Azobenzene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzo(a)anthracene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzo(a)pyrene	ND (0.378)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzo(b)fluoranthene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzo(g,h,i)perylene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzo(k)fluoranthene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzoic Acid	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Benzyl Alcohol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
bis(2-Chloroethoxy)methane	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
bis(2-Chloroethyl)ether	ND (0.378)		8270D		1	09/05/19 0:40	C9I0030	CH92856
bis(2-chloroisopropyl)Ether	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
bis(2-Ethylhexyl)phthalate	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Butylbenzylphthalate	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Carbazole	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Chrysene	**0.398** (0.378)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Dibenzo(a,h)Anthracene	ND (0.378)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Dibenzofuran	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Diethylphthalate	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Dimethylphthalate	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Di-n-butylphthalate	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Di-n-octylphthalate	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Fluoranthene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Fluorene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Hexachlorobenzene	ND (0.378)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Hexachlorobutadiene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Hexachlorocyclopentadiene	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Hexachloroethane	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Indeno(1,2,3-cd)Pyrene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Isophorone	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Naphthalene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 4-6ft
Date Sampled: 08/28/19 09:10
Percent Solids: 84
Initial Volume: 15.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
N-Nitrosodimethylamine	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
N-Nitroso-Di-n-Propylamine	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
N-nitrosodiphenylamine	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Pentachlorophenol	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Phenanthrene	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Phenol	ND (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Pyrene	**0.859** (0.754)		8270D		1	09/05/19 0:40	C9I0030	CH92856
Pyridine	ND (3.78)		8270D		1	09/05/19 0:40	C9I0030	CH92856

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*70 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*77 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*83 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*66 %*		*30-130*
Surrogate: 2-Fluorophenol	*73 %*		*30-130*
Surrogate: Nitrobenzene-d5	*59 %*		*30-130*
Surrogate: Phenol-d6	*79 %*		*30-130*
Surrogate: p-Terphenyl-d14	*90 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.06)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Arsenic	**7.69** (2.03)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Beryllium	**0.28** (0.09)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Cadmium	ND (0.41)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Chromium	**15.6** (0.81)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Copper	**17.7** (2.03)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Lead	**60.8** (4.06)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Mercury	**0.158** (0.019)		7471B		1	MKS	09/04/19 11:46	1.13	40	CI90360
Nickel	**12.1** (2.03)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Selenium	ND (4.06)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Silver	ND (0.41)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359
Thallium	ND (0.41)		6020A		1	NAR	09/09/19 19:05	2.67	100	CI90359
Zinc	**54.8** (2.03)		6010C		1	KJK	09/04/19 11:27	2.67	100	CI90359

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 9.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,1,1-Trichloroethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,1,2,2-Tetrachloroethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,1,2-Trichloroethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,1-Dichloroethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,1-Dichloroethene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,1-Dichloropropene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2,3-Trichlorobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2,3-Trichloropropane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2,4-Trichlorobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2,4-Trimethylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2-Dibromo-3-Chloropropane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2-Dibromoethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2-Dichlorobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2-Dichloroethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,2-Dichloropropane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,3,5-Trimethylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,3-Dichlorobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,3-Dichloropropane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,4-Dichlorobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1,4-Dioxane	ND (0.0559)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
1-Chlorohexane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
2,2-Dichloropropane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
2-Butanone	ND (0.0280)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
2-Chlorotoluene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
2-Hexanone	ND (0.0280)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
4-Chlorotoluene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
4-Isopropyltoluene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
4-Methyl-2-Pentanone	ND (0.0280)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Acetone	ND (0.0280)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Benzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Bromobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 9.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Bromodichloromethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Bromoform	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Bromomethane	ND (0.0056)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Carbon Disulfide	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Carbon Tetrachloride	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Chlorobenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Chloroethane	ND (0.0056)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Chloroform	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Chloromethane	ND (0.0056)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
cis-1,2-Dichloroethene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
cis-1,3-Dichloropropene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Dibromochloromethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Dibromomethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Dichlorodifluoromethane	ND (0.0056)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Diethyl Ether	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Di-isopropyl ether	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Ethyl tertiary-butyl ether	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Ethylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Hexachlorobutadiene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Isopropylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Methyl tert-Butyl Ether	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Methylene Chloride	ND (0.0140)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Naphthalene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
n-Butylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
n-Propylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
sec-Butylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Styrene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
tert-Butylbenzene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Tertiary-amyl methyl ether	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Tetrachloroethene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Tetrahydrofuran	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 9.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
trans-1,2-Dichloroethene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
trans-1,3-Dichloropropene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Trichloroethene	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Trichlorofluoromethane	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Vinyl Acetate	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Vinyl Chloride	ND (0.0056)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Xylene O	ND (0.0028)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Xylene P,M	ND (0.0056)		8260B Low		1	08/30/19 13:58	C9H0632	CH93024
Xylenes (Total)	ND (0.00559)		8260B Low		1	08/30/19 13:58		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*106 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*82 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 19.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/28/19 16:13

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1221	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1232	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1242	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1248	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1254	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1260	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1262	ND (0.06)		8082A		1	08/29/19 15:48		CH92803
Aroclor 1268	ND (0.06)		8082A		1	08/29/19 15:48		CH92803

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*48 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*51 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*60 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*64 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 20.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/28/19 18:30

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**543** (389)		8100M		10	08/30/19 3:57	C9H0605	CH92855

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*71 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 15.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
1,2,4-Trichlorobenzene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
1,2-Dichlorobenzene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
1,3-Dichlorobenzene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
1,4-Dichlorobenzene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,3,4,6-Tetrachlorophenol	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,4,5-Trichlorophenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,4,6-Trichlorophenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,4-Dichlorophenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,4-Dimethylphenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,4-Dinitrophenol	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,4-Dinitrotoluene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2,6-Dinitrotoluene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2-Chloronaphthalene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2-Chlorophenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2-Methylnaphthalene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2-Methylphenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2-Nitroaniline	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
2-Nitrophenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
3,3´-Dichlorobenzidine	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
3+4-Methylphenol	ND (1.44)		8270D		1	09/05/19 1:09	C9I0030	CH92856
3-Nitroaniline	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4,6-Dinitro-2-Methylphenol	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4-Bromophenyl-phenylether	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4-Chloro-3-Methylphenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4-Chloroaniline	ND (1.44)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4-Chloro-phenyl-phenyl ether	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4-Nitroaniline	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
4-Nitrophenol	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Acenaphthene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Acenaphthylene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Acetophenone	ND (1.44)		8270D		1	09/05/19 1:09	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 15.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (1.44)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Anthracene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Azobenzene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzo(a)anthracene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzo(a)pyrene	ND (0.360)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzo(b)fluoranthene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzo(g,h,i)perylene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzo(k)fluoranthene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzoic Acid	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Benzyl Alcohol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
bis(2-Chloroethoxy)methane	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
bis(2-Chloroethyl)ether	ND (0.360)		8270D		1	09/05/19 1:09	C9I0030	CH92856
bis(2-chloroisopropyl)Ether	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
bis(2-Ethylhexyl)phthalate	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Butylbenzylphthalate	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Carbazole	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Chrysene	ND (0.360)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Dibenzo(a,h)Anthracene	ND (0.360)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Dibenzofuran	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Diethylphthalate	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Dimethylphthalate	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Di-n-butylphthalate	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Di-n-octylphthalate	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Fluoranthene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Fluorene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Hexachlorobenzene	ND (0.360)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Hexachlorobutadiene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Hexachlorocyclopentadiene	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Hexachloroethane	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Indeno(1,2,3-cd)Pyrene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Isophorone	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Naphthalene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-4 6-10ft
Date Sampled: 08/28/19 09:30
Percent Solids: 92
Initial Volume: 15.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0896
ESS Laboratory Sample ID: 19H0896-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/28/19 18:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
N-Nitrosodimethylamine	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
N-Nitroso-Di-n-Propylamine	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
N-nitrosodiphenylamine	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Pentachlorophenol	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Phenanthrene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Phenol	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Pyrene	ND (0.718)		8270D		1	09/05/19 1:09	C9I0030	CH92856
Pyridine	ND (3.60)		8270D		1	09/05/19 1:09	C9I0030	CH92856

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*65 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*75 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*74 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*61 %*		*30-130*
Surrogate: 2-Fluorophenol	*62 %*		*30-130*
Surrogate: Nitrobenzene-d5	*53 %*		*30-130*
Surrogate: Phenol-d6	*69 %*		*30-130*
Surrogate: p-Terphenyl-d14	*78 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI90359 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Selenium	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	42.5	17.2	mg/kg wet	42.40		100	80-120			
Arsenic	112	8.62	mg/kg wet	128.0		88	80-120			
Beryllium	204	0.38	mg/kg wet	217.0		94	80-120			
Cadmium	86.3	1.72	mg/kg wet	99.00		87	80-120			
Chromium	108	3.45	mg/kg wet	116.0		93	80-120			
Copper	88.0	8.62	mg/kg wet	89.60		98	80-120			
Lead	258	17.2	mg/kg wet	277.0		93	80-120			
Nickel	104	8.62	mg/kg wet	107.0		97	80-120			
Selenium	207	17.2	mg/kg wet	242.0		86	80-120			
Silver	57.8	1.72	mg/kg wet	64.30		90	80-120			
Zinc	483	8.62	mg/kg wet	561.0		86	80-120			
LCS										
Selenium	205	8.62	mg/kg wet	242.0		85	80-120			
Thallium	161	8.62	mg/kg wet	183.0		88	80-120			
LCS Dup										
Antimony	45.7	18.2	mg/kg wet	42.40		108	80-120	7	20	
Arsenic	112	9.09	mg/kg wet	128.0		87	80-120	0.7	20	
Beryllium	203	0.40	mg/kg wet	217.0		94	80-120	0.6	20	
Cadmium	89.2	1.82	mg/kg wet	99.00		90	80-120	3	20	
Chromium	110	3.64	mg/kg wet	116.0		95	80-120	2	20	
Copper	89.2	9.09	mg/kg wet	89.60		100	80-120	1	20	
Lead	268	18.2	mg/kg wet	277.0		97	80-120	4	20	
Nickel	106	9.09	mg/kg wet	107.0		99	80-120	2	20	
Selenium	213	18.2	mg/kg wet	242.0		88	80-120	3	20	
Silver	59.4	1.82	mg/kg wet	64.30		92	80-120	3	20	
Zinc	491	9.09	mg/kg wet	561.0		88	80-120	2	20	
LCS Dup										
Selenium	233	9.09	mg/kg wet	242.0		96	80-120	13	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI90359 - 3050B										
Thallium	180	9.09	mg/kg wet	183.0		98	80-120	11	30	
Batch CI90360 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	22.3	3.54	mg/kg wet	27.30		82	80-120			
LCS Dup										
Mercury	23.3	3.30	mg/kg wet	27.30		85	80-120	4	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92956 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92956 - 5035										
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0507*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0445*		mg/kg wet	*0.05000*		*89*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0480*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0517*		mg/kg wet	*0.05000*		*103*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92956 - 5035										
LCS										
1,1,1,2-Tetrachloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,1-Trichloroethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,2,2-Tetrachloroethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,2-Trichloroethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,1-Dichloroethene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
1,1-Dichloropropene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,3-Trichlorobenzene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
1,2,3-Trichloropropane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,4-Trichlorobenzene	0.0574	0.0050	mg/kg wet	0.05000		115	70-130			
1,2,4-Trimethylbenzene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,2-Dibromo-3-Chloropropane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dibromoethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichloroethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichloropropane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,3,5-Trimethylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,3-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,3-Dichloropropane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,4-Dichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,4-Dioxane	0.949	0.100	mg/kg wet	1.000		95	70-130			
1-Chlorohexane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
2,2-Dichloropropane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
2-Butanone	0.245	0.0500	mg/kg wet	0.2500		98	70-130			
2-Chlorotoluene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		106	70-130			
4-Chlorotoluene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
4-Isopropyltoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
4-Methyl-2-Pentanone	0.255	0.0500	mg/kg wet	0.2500		102	70-130			
Acetone	0.235	0.0500	mg/kg wet	0.2500		94	70-130			
Benzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Bromobenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Bromochloromethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Bromodichloromethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Bromoform	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
Bromomethane	0.0646	0.0100	mg/kg wet	0.05000		129	70-130			
Carbon Disulfide	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
Carbon Tetrachloride	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Chlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Chloroethane	0.0422	0.0100	mg/kg wet	0.05000		84	70-130			
Chloroform	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Chloromethane	0.0394	0.0100	mg/kg wet	0.05000		79	70-130			
cis-1,2-Dichloroethene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
cis-1,3-Dichloropropene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92956 - 5035										
Dibromochloromethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Dibromomethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Dichlorodifluoromethane	0.0380	0.0100	mg/kg wet	0.05000		76	70-130			
Diethyl Ether	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Di-isopropyl ether	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Ethyl tertiary-butyl ether	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Ethylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Hexachlorobutadiene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Isopropylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Methyl tert-Butyl Ether	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Methylene Chloride	0.0520	0.0250	mg/kg wet	0.05000		104	70-130			
Naphthalene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
n-Butylbenzene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
n-Propylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
sec-Butylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Styrene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
tert-Butylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Tertiary-amyl methyl ether	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
Tetrachloroethene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Tetrahydrofuran	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Toluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
trans-1,2-Dichloroethene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
trans-1,3-Dichloropropene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Trichloroethene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Trichlorofluoromethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Vinyl Acetate	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Vinyl Chloride	0.0424	0.0100	mg/kg wet	0.05000		85	70-130			
Xylene O	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Xylene P,M	0.109	0.0100	mg/kg wet	0.1000		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0468*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0507*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0471*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Toluene-d8	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	6	25	
1,1,1-Trichloroethane	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	8	25	
1,1,2,2-Tetrachloroethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
1,1,2-Trichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,1-Dichloroethane	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	7	25	
1,1-Dichloroethene	0.0598	0.0050	mg/kg wet	0.05000		120	70-130	9	25	
1,1-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	9	25	
1,2,3-Trichlorobenzene	0.0584	0.0050	mg/kg wet	0.05000		117	70-130	6	25	
1,2,3-Trichloropropane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
1,2,4-Trichlorobenzene	0.0599	0.0050	mg/kg wet	0.05000		120	70-130	4	25	
1,2,4-Trimethylbenzene	0.0590	0.0050	mg/kg wet	0.05000		118	70-130	6	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CH92956 - 5035										
1,2-Dibromo-3-Chloropropane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
1,2-Dibromoethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	6	25	
1,2-Dichlorobenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
1,2-Dichloroethane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,2-Dichloropropane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,3,5-Trimethylbenzene	0.0573	0.0050	mg/kg wet	0.05000		115	70-130	7	25	
1,3-Dichlorobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
1,3-Dichloropropane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
1,4-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
1,4-Dioxane	1.08	0.100	mg/kg wet	1.000		108	70-130	13	20	
1-Chlorohexane	0.0569	0.0050	mg/kg wet	0.05000		114	70-130	12	25	
2,2-Dichloropropane	0.0572	0.0050	mg/kg wet	0.05000		114	70-130	9	25	
2-Butanone	0.264	0.0500	mg/kg wet	0.2500		106	70-130	7	25	
2-Chlorotoluene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	6	25	
2-Hexanone	0.285	0.0500	mg/kg wet	0.2500		114	70-130	7	25	
4-Chlorotoluene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	6	25	
4-Isopropyltoluene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	7	25	
4-Methyl-2-Pentanone	0.269	0.0500	mg/kg wet	0.2500		107	70-130	5	25	
Acetone	0.256	0.0500	mg/kg wet	0.2500		103	70-130	9	25	
Benzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
Bromobenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Bromochloromethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Bromodichloromethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
Bromoform	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
Bromomethane	0.0691	0.0100	mg/kg wet	0.05000		138	70-130	7	25	B+
Carbon Disulfide	0.0627	0.0050	mg/kg wet	0.05000		125	70-130	9	25	
Carbon Tetrachloride	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	8	25	
Chlorobenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	7	25	
Chloroethane	0.0454	0.0100	mg/kg wet	0.05000		91	70-130	7	25	
Chloroform	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
Chloromethane	0.0413	0.0100	mg/kg wet	0.05000		83	70-130	5	25	
cis-1,2-Dichloroethene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
cis-1,3-Dichloropropene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	6	25	
Dibromochloromethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	5	25	
Dibromomethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Dichlorodifluoromethane	0.0415	0.0100	mg/kg wet	0.05000		83	70-130	9	25	
Diethyl Ether	0.0558	0.0050	mg/kg wet	0.05000		112	70-130	4	25	
Di-isopropyl ether	0.0560	0.0050	mg/kg wet	0.05000		112	70-130	5	25	
Ethyl tertiary-butyl ether	0.0569	0.0050	mg/kg wet	0.05000		114	70-130	9	25	
Ethylbenzene	0.0582	0.0050	mg/kg wet	0.05000		116	70-130	8	25	
Hexachlorobutadiene	0.0567	0.0050	mg/kg wet	0.05000		113	70-130	8	25	
Isopropylbenzene	0.0584	0.0050	mg/kg wet	0.05000		117	70-130	8	25	
Methyl tert-Butyl Ether	0.0578	0.0050	mg/kg wet	0.05000		116	70-130	6	25	
Methylene Chloride	0.0552	0.0250	mg/kg wet	0.05000		110	70-130	6	25	
Naphthalene	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	7	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH92956 - 5035										
n-Butylbenzene	0.0597	0.0050	mg/kg wet	0.05000		119	70-130	8	25	
n-Propylbenzene	0.0579	0.0050	mg/kg wet	0.05000		116	70-130	8	25	
sec-Butylbenzene	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	8	25	
Styrene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	7	25	
tert-Butylbenzene	0.0587	0.0050	mg/kg wet	0.05000		117	70-130	9	25	
Tertiary-amyl methyl ether	0.0602	0.0050	mg/kg wet	0.05000		120	70-130	8	25	
Tetrachloroethene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	9	25	
Tetrahydrofuran	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	8	25	
Toluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
trans-1,2-Dichloroethene	0.0582	0.0050	mg/kg wet	0.05000		116	70-130	8	25	
trans-1,3-Dichloropropene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
Trichloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
Trichlorofluoromethane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	8	25	
Vinyl Acetate	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	5	25	
Vinyl Chloride	0.0468	0.0100	mg/kg wet	0.05000		94	70-130	10	25	
Xylene O	0.0583	0.0050	mg/kg wet	0.05000		117	70-130	8	25	
Xylene P,M	0.119	0.0100	mg/kg wet	0.1000		119	70-130	9	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0459*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0508*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0470*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Toluene-d8	*0.0502*		mg/kg wet	*0.05000*		*100*	*70-130*			
Batch CH93024 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0526*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0440*		mg/kg wet	*0.05000*		*88*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0527*		mg/kg wet	*0.05000*		*105*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,1-Trichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,1,2,2-Tetrachloroethane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
1,1,2-Trichloroethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,1-Dichloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,1-Dichloroethene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloropropene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
1,2,3-Trichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,3-Trichloropropane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
1,2,4-Trichlorobenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,4-Trimethylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dibromo-3-Chloropropane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
1,2-Dibromoethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloropropane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
1,3,5-Trimethylbenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
1,3-Dichloropropane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
1,4-Dioxane	0.719	0.100	mg/kg wet	1.000		72	70-130			
1-Chlorohexane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
2,2-Dichloropropane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
2-Butanone	0.214	0.0500	mg/kg wet	0.2500		85	70-130			
2-Chlorotoluene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
2-Hexanone	0.207	0.0500	mg/kg wet	0.2500		83	70-130			
4-Chlorotoluene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
4-Isopropyltoluene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
4-Methyl-2-Pentanone	0.215	0.0500	mg/kg wet	0.2500		86	70-130			
Acetone	0.181	0.0500	mg/kg wet	0.2500		72	70-130			
Benzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Bromobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Bromochloromethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Bromodichloromethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
Bromoform	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Bromomethane	0.0633	0.0100	mg/kg wet	0.05000		127	70-130			
Carbon Disulfide	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Carbon Tetrachloride	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Chlorobenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Chloroethane	0.0391	0.0100	mg/kg wet	0.05000		78	70-130			
Chloroform	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Chloromethane	0.0338	0.0100	mg/kg wet	0.05000		68	70-130			B-
cis-1,2-Dichloroethene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
cis-1,3-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Dibromochloromethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Dibromomethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Dichlorodifluoromethane	0.0341	0.0100	mg/kg wet	0.05000		68	70-130			B-
Diethyl Ether	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Di-isopropyl ether	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
Ethyl tertiary-butyl ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Ethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Hexachlorobutadiene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Isopropylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Methyl tert-Butyl Ether	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
Methylene Chloride	0.0522	0.0250	mg/kg wet	0.05000		104	70-130			
Naphthalene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
n-Butylbenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
n-Propylbenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
sec-Butylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Tetrachloroethene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
Tetrahydrofuran	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			
Toluene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
trans-1,2-Dichloroethene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
trans-1,3-Dichloropropene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
Trichloroethene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
Trichlorofluoromethane	0.0421	0.0050	mg/kg wet	0.05000		84	70-130			
Vinyl Acetate	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Vinyl Chloride	0.0393	0.0100	mg/kg wet	0.05000		79	70-130			
Xylene O	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Xylene P,M	0.0995	0.0100	mg/kg wet	0.1000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0479*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	3	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
1,1,1-Trichloroethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
1,1,2,2-Tetrachloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,1,2-Trichloroethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,1-Dichloroethene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,1-Dichloropropene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
1,2,3-Trichlorobenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	5	25	
1,2,3-Trichloropropane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,2,4-Trichlorobenzene	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
1,2,4-Trimethylbenzene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
1,2-Dibromo-3-Chloropropane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	14	25	
1,2-Dibromoethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
1,2-Dichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
1,2-Dichloroethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,2-Dichloropropane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
1,3,5-Trimethylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	5	25	
1,3-Dichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,3-Dichloropropane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
1,4-Dichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,4-Dioxane	0.848	0.100	mg/kg wet	1.000		85	70-130	17	20	
1-Chlorohexane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	8	25	
2,2-Dichloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
2-Butanone	0.232	0.0500	mg/kg wet	0.2500		93	70-130	8	25	
2-Chlorotoluene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
2-Hexanone	0.236	0.0500	mg/kg wet	0.2500		95	70-130	13	25	
4-Chlorotoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
4-Isopropyltoluene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
4-Methyl-2-Pentanone	0.240	0.0500	mg/kg wet	0.2500		96	70-130	11	25	
Acetone	0.212	0.0500	mg/kg wet	0.2500		85	70-130	16	25	
Benzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	5	25	
Bromobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
Bromochloromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
Bromodichloromethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Bromoform	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
Bromomethane	0.0645	0.0100	mg/kg wet	0.05000		129	70-130	2	25	
Carbon Disulfide	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	7	25	
Carbon Tetrachloride	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
Chlorobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
Chloroethane	0.0409	0.0100	mg/kg wet	0.05000		82	70-130	5	25	
Chloroform	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Chloromethane	0.0359	0.0100	mg/kg wet	0.05000		72	70-130	6	25	
cis-1,2-Dichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
cis-1,3-Dichloropropene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	2	25	
Dibromochloromethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	3	25	
Dibromomethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
Dichlorodifluoromethane	0.0365	0.0100	mg/kg wet	0.05000		73	70-130	7	25	
Diethyl Ether	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	4	25	
Di-isopropyl ether	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	3	25	
Ethyl tertiary-butyl ether	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
Ethylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
Hexachlorobutadiene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	7	25	
Isopropylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
Methyl tert-Butyl Ether	0.0574	0.0050	mg/kg wet	0.05000		115	70-130	5	25	
Methylene Chloride	0.0545	0.0250	mg/kg wet	0.05000		109	70-130	4	25	
Naphthalene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	12	25	
n-Butylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
n-Propylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
sec-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	7	25	
Styrene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
tert-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
Tertiary-amyl methyl ether	0.0608	0.0050	mg/kg wet	0.05000		122	70-130	7	25	
Tetrachloroethene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	5	25	
Tetrahydrofuran	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	10	25	
Toluene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
trans-1,2-Dichloroethene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	7	25	
trans-1,3-Dichloropropene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
Trichloroethene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	5	25	
Trichlorofluoromethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
Vinyl Acetate	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
Vinyl Chloride	0.0425	0.0100	mg/kg wet	0.05000		85	70-130	8	25	
Xylene O	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	6	25	
Xylene P,M	0.105	0.0100	mg/kg wet	0.1000		105	70-130	6	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0466*		mg/kg wet	*0.05000*		*93*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0478*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0485*		mg/kg wet	*0.05000*		*97*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CH92803 - 3540C										
Blank										
Aroclor 1016	ND	0.05	mg/kg wet							
Aroclor 1016 [2C]	ND	0.05	mg/kg wet							
Aroclor 1221	ND	0.05	mg/kg wet							
Aroclor 1221 [2C]	ND	0.05	mg/kg wet							
Aroclor 1232	ND	0.05	mg/kg wet							
Aroclor 1232 [2C]	ND	0.05	mg/kg wet							
Aroclor 1242	ND	0.05	mg/kg wet							
Aroclor 1242 [2C]	ND	0.05	mg/kg wet							
Aroclor 1248	ND	0.05	mg/kg wet							
Aroclor 1248 [2C]	ND	0.05	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CH92803 - 3540C										
Aroclor 1254	ND	0.05	mg/kg wet							
Aroclor 1254 [2C]	ND	0.05	mg/kg wet							
Aroclor 1260	ND	0.05	mg/kg wet							
Aroclor 1260 [2C]	ND	0.05	mg/kg wet							
Aroclor 1262	ND	0.05	mg/kg wet							
Aroclor 1262 [2C]	ND	0.05	mg/kg wet							
Aroclor 1268	ND	0.05	mg/kg wet							
Aroclor 1268 [2C]	ND	0.05	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0211*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0211*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0172*		mg/kg wet	*0.02500*		*69*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0178*		mg/kg wet	*0.02500*		*71*	*30-150*			
LCS										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		90	40-140			
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		94	40-140			
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		88	40-140			
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		89	40-140			
Surrogate: Decachlorobiphenyl	*0.0219*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0218*		mg/kg wet	*0.02500*		*87*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0183*		mg/kg wet	*0.02500*		*73*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0179*		mg/kg wet	*0.02500*		*72*	*30-150*			
LCS Dup										
Aroclor 1016	0.4	0.05	mg/kg wet	0.5000		89	40-140	1	30	
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		94	40-140	0.3	30	
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		90	40-140	2	30	
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		93	40-140	4	30	
Surrogate: Decachlorobiphenyl	*0.0221*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0219*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0180*		mg/kg wet	*0.02500*		*72*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0178*		mg/kg wet	*0.02500*		*71*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CH92855 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CH92855 - 3546										
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.56*		mg/kg wet	*5.000*		*91*	*40-140*			
LCS										
Decane (C10)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		86	40-140			
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		68	30-140			
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		94	40-140			
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Total Petroleum Hydrocarbons	31.1	37.5	mg/kg wet	35.00		89	40-140			
Triacontane (C30)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Surrogate: O-Terphenyl	*4.60*		mg/kg wet	*5.000*		*92*	*40-140*			
LCS Dup										
Decane (C10)	2.6	0.2	mg/kg wet	2.500		104	40-140	26	25	D+
Docosane (C22)	3.0	0.2	mg/kg wet	2.500		119	40-140	21	25	
Dodecane (C12)	2.8	0.2	mg/kg wet	2.500		110	40-140	24	25	
Eicosane (C20)	3.0	0.2	mg/kg wet	2.500		118	40-140	21	25	
Hexacosane (C26)	2.9	0.2	mg/kg wet	2.500		115	40-140	21	25	
Hexadecane (C16)	2.9	0.2	mg/kg wet	2.500		116	40-140	24	25	
Nonadecane (C19)	3.1	0.2	mg/kg wet	2.500		124	40-140	21	25	
Nonane (C9)	2.2	0.2	mg/kg wet	2.500		89	30-140	27	25	D+
Octacosane (C28)	2.9	0.2	mg/kg wet	2.500		114	40-140	21	25	
Octadecane (C18)	2.9	0.2	mg/kg wet	2.500		117	40-140	22	25	
Tetracosane (C24)	2.9	0.2	mg/kg wet	2.500		118	40-140	21	25	
Tetradecane (C14)	2.9	0.2	mg/kg wet	2.500		114	40-140	25	25	
Total Petroleum Hydrocarbons	39.1	37.5	mg/kg wet	35.00		112	40-140	23	25	
Triacontane (C30)	2.8	0.2	mg/kg wet	2.500		111	40-140	21	25	
Surrogate: O-Terphenyl	*5.62*		mg/kg wet	*5.000*		*112*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.333	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.167	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.61*		mg/kg wet	*3.333*		*78*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.62*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.29*		mg/kg wet	*5.000*		*86*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.91*		mg/kg wet	*3.333*		*87*	*30-130*			
Surrogate: 2-Fluorophenol	*4.48*		mg/kg wet	*5.000*		*90*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.92*		mg/kg wet	*3.333*		*88*	*30-130*			
Surrogate: Phenol-d6	*4.39*		mg/kg wet	*5.000*		*88*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.91*		mg/kg wet	*3.333*		*87*	*30-130*			
LCS										
1,1-Biphenyl	2.34	0.333	mg/kg wet	3.333		70	40-140			
1,2,4-Trichlorobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140			
1,2-Dichlorobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140			
1,3-Dichlorobenzene	2.44	0.333	mg/kg wet	3.333		73	40-140			
1,4-Dichlorobenzene	2.40	0.333	mg/kg wet	3.333		72	40-140			
2,3,4,6-Tetrachlorophenol	2.52	1.67	mg/kg wet	3.333		76	30-130			
2,4,5-Trichlorophenol	2.59	0.333	mg/kg wet	3.333		78	30-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										
2,4,6-Trichlorophenol	2.37	0.333	mg/kg wet	3.333		71	30-130			
2,4-Dichlorophenol	2.44	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dimethylphenol	2.39	0.333	mg/kg wet	3.333		72	30-130			
2,4-Dinitrophenol	2.62	1.67	mg/kg wet	3.333		79	30-130			
2,4-Dinitrotoluene	2.68	0.333	mg/kg wet	3.333		81	40-140			
2,6-Dinitrotoluene	2.78	0.333	mg/kg wet	3.333		83	40-140			
2-Chloronaphthalene	2.37	0.333	mg/kg wet	3.333		71	40-140			
2-Chlorophenol	2.53	0.333	mg/kg wet	3.333		76	30-130			
2-Methylnaphthalene	2.36	0.333	mg/kg wet	3.333		71	40-140			
2-Methylphenol	2.51	0.333	mg/kg wet	3.333		75	30-130			
2-Nitroaniline	2.63	0.333	mg/kg wet	3.333		79	40-140			
2-Nitrophenol	2.31	0.333	mg/kg wet	3.333		69	30-130			
3,3´-Dichlorobenzidine	2.65	0.333	mg/kg wet	3.333		80	40-140			
3+4-Methylphenol	5.48	0.667	mg/kg wet	6.667		82	30-130			
3-Nitroaniline	2.44	0.333	mg/kg wet	3.333		73	40-140			
4,6-Dinitro-2-Methylphenol	2.86	1.67	mg/kg wet	3.333		86	30-130			
4-Bromophenyl-phenylether	2.92	0.333	mg/kg wet	3.333		88	40-140			
4-Chloro-3-Methylphenol	2.61	0.333	mg/kg wet	3.333		78	30-130			
4-Chloroaniline	1.74	0.667	mg/kg wet	3.333		52	40-140			
4-Chloro-phenyl-phenyl ether	2.71	0.333	mg/kg wet	3.333		81	40-140			
4-Nitroaniline	2.51	0.333	mg/kg wet	3.333		75	40-140			
4-Nitrophenol	2.74	1.67	mg/kg wet	3.333		82	30-130			
Acenaphthene	2.41	0.333	mg/kg wet	3.333		72	40-140			
Acenaphthylene	2.14	0.333	mg/kg wet	3.333		64	40-140			
Acetophenone	2.39	0.667	mg/kg wet	3.333		72	40-140			
Aniline	1.92	0.667	mg/kg wet	3.333		58	40-140			
Anthracene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Azobenzene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Benzo(a)anthracene	2.85	0.333	mg/kg wet	3.333		85	40-140			
Benzo(a)pyrene	2.76	0.167	mg/kg wet	3.333		83	40-140			
Benzo(b)fluoranthene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Benzo(g,h,i)perylene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Benzo(k)fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140			
Benzoic Acid	2.40	1.67	mg/kg wet	3.333		72	40-140			
Benzyl Alcohol	2.24	0.333	mg/kg wet	3.333		67	40-140			
bis(2-Chloroethoxy)methane	2.44	0.333	mg/kg wet	3.333		73	40-140			
bis(2-Chloroethyl)ether	2.64	0.167	mg/kg wet	3.333		79	40-140			
bis(2-chloroisopropyl)Ether	2.39	0.333	mg/kg wet	3.333		72	40-140			
bis(2-Ethylhexyl)phthalate	3.05	0.333	mg/kg wet	3.333		91	40-140			
Butylbenzylphthalate	3.01	0.333	mg/kg wet	3.333		90	40-140			
Carbazole	2.78	0.333	mg/kg wet	3.333		83	40-140			
Chrysene	2.84	0.167	mg/kg wet	3.333		85	40-140			
Dibenzo(a,h)Anthracene	2.85	0.167	mg/kg wet	3.333		86	40-140			
Dibenzofuran	2.44	0.333	mg/kg wet	3.333		73	40-140			
Diethylphthalate	2.86	0.333	mg/kg wet	3.333		86	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										
Dimethylphthalate	2.80	0.333	mg/kg wet	3.333		84	40-140			
Di-n-butylphthalate	3.00	0.333	mg/kg wet	3.333		90	40-140			
Di-n-octylphthalate	3.10	0.333	mg/kg wet	3.333		93	40-140			
Fluoranthene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Fluorene	2.65	0.333	mg/kg wet	3.333		79	40-140			
Hexachlorobenzene	2.80	0.167	mg/kg wet	3.333		84	40-140			
Hexachlorobutadiene	2.37	0.333	mg/kg wet	3.333		71	40-140			
Hexachlorocyclopentadiene	1.43	1.67	mg/kg wet	3.333		43	40-140			
Hexachloroethane	2.24	0.333	mg/kg wet	3.333		67	40-140			
Indeno(1,2,3-cd)Pyrene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Isophorone	2.04	0.333	mg/kg wet	3.333		61	40-140			
Naphthalene	2.48	0.333	mg/kg wet	3.333		74	40-140			
Nitrobenzene	2.38	0.333	mg/kg wet	3.333		71	40-140			
N-Nitrosodimethylamine	2.43	0.333	mg/kg wet	3.333		73	40-140			
N-Nitroso-Di-n-Propylamine	2.51	0.333	mg/kg wet	3.333		75	40-140			
N-nitrosodiphenylamine	2.87	0.333	mg/kg wet	3.333		86	40-140			
Pentachlorophenol	2.77	1.67	mg/kg wet	3.333		83	30-130			
Phenanthrene	2.64	0.333	mg/kg wet	3.333		79	40-140			
Phenol	2.64	0.333	mg/kg wet	3.333		79	30-130			
Pyrene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Pyridine	2.11	1.67	mg/kg wet	3.333		63	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.23*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.80*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.71*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.34*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2-Fluorophenol	*3.87*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.54*		mg/kg wet	*3.333*		*76*	*30-130*			
Surrogate: Phenol-d6	*3.89*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.74*		mg/kg wet	*3.333*		*82*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.31	0.333	mg/kg wet	3.333		69	40-140	2	30	
1,2,4-Trichlorobenzene	2.53	0.333	mg/kg wet	3.333		76	40-140	1	30	
1,2-Dichlorobenzene	2.46	0.333	mg/kg wet	3.333		74	40-140	4	30	
1,3-Dichlorobenzene	2.41	0.333	mg/kg wet	3.333		72	40-140	1	30	
1,4-Dichlorobenzene	2.36	0.333	mg/kg wet	3.333		71	40-140	1	30	
2,3,4,6-Tetrachlorophenol	2.65	1.67	mg/kg wet	3.333		79	30-130	5	30	
2,4,5-Trichlorophenol	2.65	0.333	mg/kg wet	3.333		79	30-130	2	30	
2,4,6-Trichlorophenol	2.40	0.333	mg/kg wet	3.333		72	30-130	1	30	
2,4-Dichlorophenol	2.50	0.333	mg/kg wet	3.333		75	30-130	2	30	
2,4-Dimethylphenol	2.29	0.333	mg/kg wet	3.333		69	30-130	4	30	
2,4-Dinitrophenol	2.70	1.67	mg/kg wet	3.333		81	30-130	3	30	
2,4-Dinitrotoluene	2.79	0.333	mg/kg wet	3.333		84	40-140	4	30	
2,6-Dinitrotoluene	2.88	0.333	mg/kg wet	3.333		87	40-140	4	30	
2-Chloronaphthalene	2.23	0.333	mg/kg wet	3.333		67	40-140	6	30	
2-Chlorophenol	2.51	0.333	mg/kg wet	3.333		75	30-130	0.7	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										
2-Methylnaphthalene	2.41	0.333	mg/kg wet	3.333		72	40-140	2	30	
2-Methylphenol	2.33	0.333	mg/kg wet	3.333		70	30-130	7	30	
2-Nitroaniline	2.22	0.333	mg/kg wet	3.333		67	40-140	17	30	
2-Nitrophenol	2.26	0.333	mg/kg wet	3.333		68	30-130	2	30	
3,3´-Dichlorobenzidine	2.73	0.333	mg/kg wet	3.333		82	40-140	3	30	
3+4-Methylphenol	5.06	0.667	mg/kg wet	6.667		76	30-130	8	30	
3-Nitroaniline	2.51	0.333	mg/kg wet	3.333		75	40-140	3	30	
4,6-Dinitro-2-Methylphenol	2.94	1.67	mg/kg wet	3.333		88	30-130	3	30	
4-Bromophenyl-phenylether	3.04	0.333	mg/kg wet	3.333		91	40-140	4	30	
4-Chloro-3-Methylphenol	2.51	0.333	mg/kg wet	3.333		75	30-130	4	30	
4-Chloroaniline	1.76	0.667	mg/kg wet	3.333		53	40-140	0.8	30	
4-Chloro-phenyl-phenyl ether	2.79	0.333	mg/kg wet	3.333		84	40-140	3	30	
4-Nitroaniline	2.65	0.333	mg/kg wet	3.333		80	40-140	5	30	
4-Nitrophenol	2.69	1.67	mg/kg wet	3.333		81	30-130	2	30	
Acenaphthene	2.42	0.333	mg/kg wet	3.333		73	40-140	0.5	30	
Acenaphthylene	2.16	0.333	mg/kg wet	3.333		65	40-140	0.9	30	
Acetophenone	2.20	0.667	mg/kg wet	3.333		66	40-140	8	30	
Aniline	1.86	0.667	mg/kg wet	3.333		56	40-140	3	30	
Anthracene	2.75	0.333	mg/kg wet	3.333		83	40-140	0.4	30	
Azobenzene	2.70	0.333	mg/kg wet	3.333		81	40-140	3	30	
Benzo(a)anthracene	2.87	0.333	mg/kg wet	3.333		86	40-140	1	30	
Benzo(a)pyrene	2.74	0.167	mg/kg wet	3.333		82	40-140	0.8	30	
Benzo(b)fluoranthene	2.56	0.333	mg/kg wet	3.333		77	40-140	2	30	
Benzo(g,h,i)perylene	2.87	0.333	mg/kg wet	3.333		86	40-140	2	30	
Benzo(k)fluoranthene	3.12	0.333	mg/kg wet	3.333		94	40-140	1	30	
Benzoic Acid	2.35	1.67	mg/kg wet	3.333		71	40-140	2	30	
Benzyl Alcohol	1.95	0.333	mg/kg wet	3.333		59	40-140	14	30	
bis(2-Chloroethoxy)methane	2.27	0.333	mg/kg wet	3.333		68	40-140	7	30	
bis(2-Chloroethyl)ether	2.57	0.167	mg/kg wet	3.333		77	40-140	3	30	
bis(2-chloroisopropyl)Ether	2.23	0.333	mg/kg wet	3.333		67	40-140	7	30	
bis(2-Ethylhexyl)phthalate	2.98	0.333	mg/kg wet	3.333		90	40-140	2	30	
Butylbenzylphthalate	2.86	0.333	mg/kg wet	3.333		86	40-140	5	30	
Carbazole	2.81	0.333	mg/kg wet	3.333		84	40-140	1	30	
Chrysene	2.85	0.167	mg/kg wet	3.333		85	40-140	0.2	30	
Dibenzo(a,h)Anthracene	2.89	0.167	mg/kg wet	3.333		87	40-140	1	30	
Dibenzofuran	2.50	0.333	mg/kg wet	3.333		75	40-140	3	30	
Diethylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140	5	30	
Dimethylphthalate	2.91	0.333	mg/kg wet	3.333		87	40-140	4	30	
Di-n-butylphthalate	2.97	0.333	mg/kg wet	3.333		89	40-140	1	30	
Di-n-octylphthalate	2.92	0.333	mg/kg wet	3.333		88	40-140	6	30	
Fluoranthene	2.85	0.333	mg/kg wet	3.333		86	40-140	1	30	
Fluorene	2.70	0.333	mg/kg wet	3.333		81	40-140	2	30	
Hexachlorobenzene	2.86	0.167	mg/kg wet	3.333		86	40-140	2	30	
Hexachlorobutadiene	2.43	0.333	mg/kg wet	3.333		73	40-140	3	30	
Hexachlorocyclopentadiene	1.48	1.67	mg/kg wet	3.333		44	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH92856 - 3546										
Hexachloroethane	2.09	0.333	mg/kg wet	3.333		63	40-140	7	30	
Indeno(1,2,3-cd)Pyrene	2.86	0.333	mg/kg wet	3.333		86	40-140	1	30	
Isophorone	1.87	0.333	mg/kg wet	3.333		56	40-140	8	30	
Naphthalene	2.40	0.333	mg/kg wet	3.333		72	40-140	3	30	
Nitrobenzene	2.13	0.333	mg/kg wet	3.333		64	40-140	11	30	
N-Nitrosodimethylamine	2.43	0.333	mg/kg wet	3.333		73	40-140	0.3	30	
N-Nitroso-Di-n-Propylamine	2.23	0.333	mg/kg wet	3.333		67	40-140	12	30	
N-nitrosodiphenylamine	2.88	0.333	mg/kg wet	3.333		86	40-140	0.3	30	
Pentachlorophenol	2.90	1.67	mg/kg wet	3.333		87	30-130	5	30	
Phenanthrene	2.76	0.333	mg/kg wet	3.333		83	40-140	4	30	
Phenol	2.60	0.333	mg/kg wet	3.333		78	30-130	1	30	
Pyrene	2.80	0.333	mg/kg wet	3.333		84	40-140	0.1	30	
Pyridine	2.17	1.67	mg/kg wet	3.333		65	40-140	3	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.16*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.90*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.72*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.32*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2-Fluorophenol	*3.84*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.29*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: Phenol-d6	*3.84*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.78*		mg/kg wet	*3.333*		*83*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

Notes and Definitions

U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
Q	Calibration required quadratic regression (Q).
IM	Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B+	Blank Spike recovery is above upper control limit (B+).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0896

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: Client

ESS Project ID: 19H0896
Date Received: 8/28/2019
Project Due Date: 9/5/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 8/28 Time: 1511 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	382274	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	382281	Yes	NA	Yes	VOA Vial - Other	Other	
01	382282	Yes	NA	Yes	VOA Vial - Other	Other	
01	382286	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	382273	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	382279	Yes	NA	Yes	VOA Vial - Other	Other	
02	382280	Yes	NA	Yes	VOA Vial - Other	Other	
02	382285	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	382272	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	382277	Yes	NA	Yes	VOA Vial - Other	Other	
03	382278	Yes	NA	Yes	VOA Vial - Other	Other	
03	382284	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	382271	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	382275	Yes	NA	Yes	VOA Vial - Other	Other	
04	382276	Yes	NA	Yes	VOA Vial - Other	Other	
04	382283	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

ESS Project ID: 19H0896

Date Received: 8/28/2019

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By:		Date & Time:	8/28/19 1505
Reviewed By:		Date & Time:	8/28/19 1511
Delivered By:			8/28/19 1511

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1910896

Turn Time	5 Days
Regulatory State	RI
Reporting Limits	RIDEM RISDEL/ICDEC
Electonic Deliverables	[X] Data Checker [X] Excel [ ] Other (Please Specify →)

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Company Name	Beta Group
Contact Person	Jon McLoughlin
Project #	
Project Name	NBC IIA-4 and IIA-5
Address	701 Grand Washington Hwy
City	Lincoln
State	RI
Zip Code	02865
PO #	
Telephone Number	401.333.2382
FAX Number	
Email Address	jmcloughlin@beta-inc.com

Analysis: VOCs, SVOCs, PCBs, TPH, PAH3 metals

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	PCBs	TPH	PAH3 metals
1	8/28/19	8:30	Grab	Soil	B-4 0-2'	X	X	X	X	X
2		8:45			B-4 2-4'	X	X	X	X	X
3		9:10			B-4 4-6'	X	X	X	X	X
4		9:30	Comp		B-4 6-10'	X	X	X	X	X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V	AG
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*
Number of Containers per Sample:										3	1

Laboratory Use Only

Cooler Present: —
Seals Intact: —
Cooler Temperature: Ice 3.1 °C

○ Drop Off
○ Pickup

Sampled by: Scott Nee

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
8/28/19 1:51	8/28/19 13:51		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (N/A)
ESS Laboratory Work Order Number: 19I0088

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:32 pm, Sep 13, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

SAMPLE RECEIPT

The following samples were received on September 05, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 9/5/19 at 18:25.

Lab Number	Sample Name	Matrix	Analysis
19I0088-01	B-8 0-2ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19I0088-02	B-8 2-4ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

PROJECT NARRATIVE

8270D Semi-Volatile Organic Compounds

C9I0114-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (91% @ 80-120%), 4,6-Dinitro-2-Methylphenol (101% @ 80-120%), Benzoic Acid (82% @ 80-120%), Di-n-octylphthalate (113% @ 80-120%), Pentachlorophenol (104% @ 80-120%)

C9I0114-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2-Nitroaniline (25% @ 20%)

C9I0144-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (89% @ 80-120%), 4,6-Dinitro-2-Methylphenol (95% @ 80-120%), Benzoic Acid (78% @ 80-120%), Di-n-octylphthalate (112% @ 80-120%), Pentachlorophenol (101% @ 80-120%)

C9I0144-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2-Nitroaniline (24% @ 20%), Benzoic Acid (22% @ 20%)

Total Metals

CI90963-BSD3 **Blank Spike recovery is below lower control limit (B-).**
Antimony (33% @ 40-160%), Silver (40% @ 80-120%)

CI90963-BSD3 **Relative percent difference for duplicate is outside of criteria (D+).**
Silver (76% @ 20%)

CI90964-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Mercury (163% @ 20%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (3.69)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Arsenic	**9.94** (1.85)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Beryllium	**0.25** (0.08)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Cadmium	ND (0.37)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Chromium	**7.00** (0.74)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Copper	**6.78** (1.85)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Lead	**5.41** (3.69)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Mercury	ND (0.027)		7471B		1	MKS	09/11/19 9:55	0.78	40	CI90964
Nickel	**9.00** (1.85)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Selenium	ND (3.69)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Silver	ND (0.37)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963
Thallium	ND (0.37)		6020A		1	KJK	09/11/19 18:02	2.88	100	CI90963
Zinc	**24.6** (1.85)		6010C		1	KJK	09/10/19 16:22	2.88	100	CI90963

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 6.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1,4-Dioxane	ND (0.0818)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
1-Chlorohexane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
2-Butanone	ND (0.0409)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
2-Chlorotoluene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
2-Hexanone	ND (0.0409)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
4-Chlorotoluene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
4-Methyl-2-Pentanone	ND (0.0409)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Acetone	ND (0.0409)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Benzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Bromobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 6.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Bromodichloromethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Bromoform	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Bromomethane	ND (0.0082)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Carbon Disulfide	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Chlorobenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Chloroethane	ND (0.0082)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Chloroform	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Chloromethane	ND (0.0082)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Dibromochloromethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Dibromomethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Dichlorodifluoromethane	ND (0.0082)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Diethyl Ether	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Di-isopropyl ether	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Ethylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Isopropylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Methylene Chloride	ND (0.0205)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Naphthalene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
n-Butylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
n-Propylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
sec-Butylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Styrene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
tert-Butylbenzene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Tetrachloroethene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Tetrahydrofuran	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 6.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Trichloroethene	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Vinyl Acetate	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Vinyl Chloride	ND (0.0082)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Xylene O	ND (0.0041)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Xylene P,M	ND (0.0082)		8260B Low		1	09/06/19 15:51	C9I0092	CI90623
Xylenes (Total)	ND (0.00818)		8260B Low		1	09/06/19 15:51		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*93 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*86 %*		*70-130*
Surrogate: Dibromofluoromethane	*98 %*		*70-130*
Surrogate: Toluene-d8	*91 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 20.7
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/6/19 16:20

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1221	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1232	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1242	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1248	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1254	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1260	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1262	ND (0.05)		8082A		1	09/09/19 17:16		CI90605
Aroclor 1268	ND (0.05)		8082A		1	09/09/19 17:16		CI90605

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*89 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*92 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*73 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*72 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 19.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/6/19 11:15

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (41.8)		8100M		1	09/06/19 18:43	C9I0094	CI90615

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*85 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/6/19 18:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
1,2,4-Trichlorobenzene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
1,2-Dichlorobenzene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
1,3-Dichlorobenzene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
1,4-Dichlorobenzene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,3,4,6-Tetrachlorophenol	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,4,5-Trichlorophenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,4,6-Trichlorophenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,4-Dichlorophenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,4-Dimethylphenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,4-Dinitrophenol	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,4-Dinitrotoluene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2,6-Dinitrotoluene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2-Chloronaphthalene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2-Chlorophenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2-Methylnaphthalene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2-Methylphenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2-Nitroaniline	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
2-Nitrophenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
3,3´-Dichlorobenzidine	ND (0.719)		8270D		1	09/11/19 1:12	C9I0144	CI90648
3+4-Methylphenol	ND (0.719)		8270D		1	09/11/19 1:12	C9I0144	CI90648
3-Nitroaniline	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4,6-Dinitro-2-Methylphenol	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4-Bromophenyl-phenylether	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4-Chloro-3-Methylphenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4-Chloroaniline	ND (0.719)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4-Chloro-phenyl-phenyl ether	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4-Nitroaniline	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
4-Nitrophenol	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Acenaphthene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Acenaphthylene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Acetophenone	ND (0.719)		8270D		1	09/11/19 1:12	C9I0144	CI90648

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/6/19 18:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.719)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Anthracene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Azobenzene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzo(a)anthracene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzo(a)pyrene	ND (0.180)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzo(b)fluoranthene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzo(g,h,i)perylene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzo(k)fluoranthene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzoic Acid	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Benzyl Alcohol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
bis(2-Chloroethoxy)methane	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
bis(2-Chloroethyl)ether	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
bis(2-chloroisopropyl)Ether	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
bis(2-Ethylhexyl)phthalate	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Butylbenzylphthalate	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Carbazole	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Chrysene	ND (0.180)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Dibenzo(a,h)Anthracene	ND (0.180)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Dibenzofuran	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Diethylphthalate	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Dimethylphthalate	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Di-n-butylphthalate	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Di-n-octylphthalate	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Fluoranthene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Fluorene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Hexachlorobenzene	ND (0.180)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Hexachlorobutadiene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Hexachlorocyclopentadiene	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Hexachloroethane	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Indeno(1,2,3-cd)Pyrene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Isophorone	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Naphthalene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 0-2ft
Date Sampled: 09/03/19 10:15
Percent Solids: 94
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/6/19 18:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
N-Nitrosodimethylamine	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
N-Nitroso-Di-n-Propylamine	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
N-nitrosodiphenylamine	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Pentachlorophenol	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Phenanthrene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Phenol	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Pyrene	ND (0.359)		8270D		1	09/11/19 1:12	C9I0144	CI90648
Pyridine	ND (1.80)		8270D		1	09/11/19 1:12	C9I0144	CI90648

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*71 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*88 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*76 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: 2-Fluorophenol	*75 %*		*30-130*
Surrogate: Nitrobenzene-d5	*72 %*		*30-130*
Surrogate: Phenol-d6	*74 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (3.93)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Arsenic	**6.88** (1.96)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Beryllium	**0.21** (0.09)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Cadmium	ND (0.39)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Chromium	**7.48** (0.79)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Copper	**5.93** (1.96)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Lead	**5.02** (3.93)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Mercury	ND (0.031)		7471B		1	MKS	09/11/19 9:57	0.68	40	CI90964
Nickel	**8.62** (1.96)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Selenium	ND (3.93)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Silver	ND (0.39)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963
Thallium	ND (0.39)		6020A		1	KJK	09/11/19 18:07	2.67	100	CI90963
Zinc	**27.1** (1.96)		6010C		1	KJK	09/10/19 16:37	2.67	100	CI90963

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1,4-Dioxane	ND (0.0795)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
2-Butanone	ND (0.0397)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
2-Hexanone	ND (0.0397)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
4-Methyl-2-Pentanone	ND (0.0397)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Acetone	ND (0.0397)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Benzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Bromobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Bromoform	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Bromomethane	ND (0.0079)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Chlorobenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Chloroethane	ND (0.0079)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Chloroform	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Chloromethane	ND (0.0079)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Dibromomethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Diethyl Ether	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Ethylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Methylene Chloride	ND (0.0199)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Naphthalene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Styrene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Trichloroethene	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Xylene O	ND (0.0040)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Xylene P,M	ND (0.0079)		8260B Low		1	09/06/19 16:16	C9I0092	CI90623
Xylenes (Total)	ND (0.00795)		8260B Low		1	09/06/19 16:16		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*92 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*87 %*		*70-130*
Surrogate: Dibromofluoromethane	*97 %*		*70-130*
Surrogate: Toluene-d8	*91 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 20.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/6/19 16:20

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1221	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1232	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1242	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1248	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1254	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1260	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1262	ND (0.05)		8082A		1	09/09/19 17:35		CI90605
Aroclor 1268	ND (0.05)		8082A		1	09/09/19 17:35		CI90605

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*91 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*94 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*75 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*74 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 20.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/6/19 11:15

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (38.8)		8100M		1	09/06/19 19:15	C9I0094	CI90615

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*85 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 14.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/6/19 18:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
1,2,4-Trichlorobenzene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
1,2-Dichlorobenzene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
1,3-Dichlorobenzene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
1,4-Dichlorobenzene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,3,4,6-Tetrachlorophenol	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,4,5-Trichlorophenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,4,6-Trichlorophenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,4-Dichlorophenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,4-Dimethylphenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,4-Dinitrophenol	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,4-Dinitrotoluene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2,6-Dinitrotoluene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2-Chloronaphthalene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2-Chlorophenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2-Methylnaphthalene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2-Methylphenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2-Nitroaniline	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
2-Nitrophenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
3,3´-Dichlorobenzidine	ND (0.729)		8270D		1	09/11/19 1:38	C9I0144	CI90648
3+4-Methylphenol	ND (0.729)		8270D		1	09/11/19 1:38	C9I0144	CI90648
3-Nitroaniline	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4,6-Dinitro-2-Methylphenol	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4-Bromophenyl-phenylether	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4-Chloro-3-Methylphenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4-Chloroaniline	ND (0.729)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4-Chloro-phenyl-phenyl ether	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4-Nitroaniline	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
4-Nitrophenol	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Acenaphthene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Acenaphthylene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Acetophenone	ND (0.729)		8270D		1	09/11/19 1:38	C9I0144	CI90648

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 14.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/6/19 18:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.729)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Anthracene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Azobenzene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzo(a)anthracene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzo(a)pyrene	ND (0.183)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzo(b)fluoranthene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzo(g,h,i)perylene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzo(k)fluoranthene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzoic Acid	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Benzyl Alcohol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
bis(2-Chloroethoxy)methane	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
bis(2-Chloroethyl)ether	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
bis(2-chloroisopropyl)Ether	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
bis(2-Ethylhexyl)phthalate	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Butylbenzylphthalate	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Carbazole	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Chrysene	ND (0.183)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Dibenzo(a,h)Anthracene	ND (0.183)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Dibenzofuran	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Diethylphthalate	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Dimethylphthalate	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Di-n-butylphthalate	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Di-n-octylphthalate	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Fluoranthene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Fluorene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Hexachlorobenzene	ND (0.183)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Hexachlorobutadiene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Hexachlorocyclopentadiene	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Hexachloroethane	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Indeno(1,2,3-cd)Pyrene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Isophorone	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Naphthalene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 2-4ft
Date Sampled: 09/03/19 10:30
Percent Solids: 95
Initial Volume: 14.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0088
ESS Laboratory Sample ID: 19I0088-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/6/19 18:35

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
N-Nitrosodimethylamine	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
N-Nitroso-Di-n-Propylamine	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
N-nitrosodiphenylamine	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Pentachlorophenol	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Phenanthrene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Phenol	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Pyrene	ND (0.364)		8270D		1	09/11/19 1:38	C9I0144	CI90648
Pyridine	ND (1.83)		8270D		1	09/11/19 1:38	C9I0144	CI90648

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*78 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*96 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*84 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: 2-Fluorophenol	*83 %*		*30-130*
Surrogate: Nitrobenzene-d5	*82 %*		*30-130*
Surrogate: Phenol-d6	*83 %*		*30-130*
Surrogate: p-Terphenyl-d14	*83 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				Total Metals						
Batch CI90963 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
LCS										
Arsenic	137	8.62	mg/kg wet	128.0		107	80-120			
Beryllium	205	0.38	mg/kg wet	217.0		94	80-120			
Cadmium	83.4	1.72	mg/kg wet	99.00		84	80-120			
Chromium	107	3.45	mg/kg wet	116.0		92	80-120			
Copper	83.7	8.62	mg/kg wet	89.60		93	80-120			
Lead	277	17.2	mg/kg wet	277.0		100	80-120			
Nickel	105	8.62	mg/kg wet	107.0		98	80-120			
Selenium	236	17.2	mg/kg wet	242.0		98	80-120			
Thallium	193	8.62	mg/kg wet	183.0		105	80-120			
Zinc	533	8.62	mg/kg wet	561.0		95	80-120			
LCS										
Zinc	ND	8.93	mg/kg wet	127.0		0	80-120			
LCS										
Antimony	52.6	17.5	mg/kg wet	42.40		124	40-160			
Silver	60.0	1.75	mg/kg wet	64.30		93	80-120			
Zinc	ND	8.77	mg/kg wet	561.0		0	80-120			
LCS Dup										
Arsenic	139	9.26	mg/kg wet	128.0		108	80-120	1	20	
Beryllium	216	0.41	mg/kg wet	217.0		100	80-120	5	20	
Cadmium	85.6	1.85	mg/kg wet	99.00		86	80-120	3	20	
Chromium	111	3.70	mg/kg wet	116.0		96	80-120	4	20	
Copper	88.0	9.26	mg/kg wet	89.60		98	80-120	5	20	
Lead	279	18.5	mg/kg wet	277.0		101	80-120	0.7	20	
Nickel	109	9.26	mg/kg wet	107.0		102	80-120	4	20	
Selenium	238	18.5	mg/kg wet	242.0		99	80-120	0.8	20	
Thallium	203	9.26	mg/kg wet	183.0		111	80-120	5	30	
Zinc	549	9.26	mg/kg wet	561.0		98	80-120	3	20	
LCS Dup										
Zinc	ND	8.62	mg/kg wet	127.0		0	80-120		20	
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI90963 - 3050B										
Antimony	43.7	15.2	mg/kg wet	133.0		33	40-160	19	20	B-
Silver	26.8	1.52	mg/kg wet	66.30		40	80-120	76	20	B-, D+
Zinc	ND	7.58	mg/kg wet	127.0		0	80-120		20	
Batch CI90964 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	23.9	2.64	mg/kg wet	27.30		88	80-120			
LCS Dup										
Mercury	2.46	0.291	mg/kg wet	3.120		79	67-121	163	20	D+
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI90623 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI90623 - 5035										
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0425*		mg/kg wet	*0.05000*		*85*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0432*		mg/kg wet	*0.05000*		*86*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI90623 - 5035										
Surrogate: Dibromofluoromethane	*0.0460*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0455*		mg/kg wet	*0.05000*		*91*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
1,1,1-Trichloroethane	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,1,2,2-Tetrachloroethane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
1,1,2-Trichloroethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,1-Dichloroethane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloroethene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
1,1-Dichloropropene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,3-Trichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,3-Trichloropropane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
1,2,4-Trichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,4-Trimethylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dibromo-3-Chloropropane	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
1,2-Dibromoethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichlorobenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dichloroethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichloropropane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,3,5-Trimethylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,3-Dichlorobenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
1,3-Dichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,4-Dioxane	0.966	0.100	mg/kg wet	1.000		97	70-130			
1-Chlorohexane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
2,2-Dichloropropane	0.0565	0.0050	mg/kg wet	0.05000		113	70-130			
2-Butanone	0.260	0.0500	mg/kg wet	0.2500		104	70-130			
2-Chlorotoluene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
2-Hexanone	0.215	0.0500	mg/kg wet	0.2500		86	70-130			
4-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
4-Isopropyltoluene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
4-Methyl-2-Pentanone	0.223	0.0500	mg/kg wet	0.2500		89	70-130			
Acetone	0.257	0.0500	mg/kg wet	0.2500		103	70-130			
Benzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Bromobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Bromochloromethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Bromodichloromethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Bromoform	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
Bromomethane	0.0480	0.0100	mg/kg wet	0.05000		96	70-130			
Carbon Disulfide	0.0570	0.0050	mg/kg wet	0.05000		114	70-130			
Carbon Tetrachloride	0.0573	0.0050	mg/kg wet	0.05000		115	70-130			
Chlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
Chloroethane	0.0459	0.0100	mg/kg wet	0.05000		92	70-130			
Chloroform	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI90623 - 5035										
Chloromethane	0.0465	0.0100	mg/kg wet	0.05000		93	70-130			
cis-1,2-Dichloroethene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
cis-1,3-Dichloropropene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Dibromochloromethane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
Dibromomethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Dichlorodifluoromethane	0.0355	0.0100	mg/kg wet	0.05000		71	70-130			
Diethyl Ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Di-isopropyl ether	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Ethyl tertiary-butyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Ethylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Hexachlorobutadiene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
Isopropylbenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Methyl tert-Butyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Methylene Chloride	0.0479	0.0250	mg/kg wet	0.05000		96	70-130			
Naphthalene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
n-Butylbenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
n-Propylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
sec-Butylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Styrene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
tert-Butylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Tertiary-amyl methyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Tetrachloroethene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Tetrahydrofuran	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
Toluene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
trans-1,2-Dichloroethene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
trans-1,3-Dichloropropene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Trichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Trichlorofluoromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Vinyl Acetate	0.0419	0.0050	mg/kg wet	0.05000		84	70-130			
Vinyl Chloride	0.0508	0.0100	mg/kg wet	0.05000		102	70-130			
Xylene O	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0410*		mg/kg wet	*0.05000*		*82*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0456*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0472*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Toluene-d8	*0.0447*		mg/kg wet	*0.05000*		*89*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	0.8	25	
1,1,1-Trichloroethane	0.0560	0.0050	mg/kg wet	0.05000		112	70-130	2	25	
1,1,2,2-Tetrachloroethane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	0.5	25	
1,1,2-Trichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
1,1-Dichloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
1,1-Dichloroethene	0.0574	0.0050	mg/kg wet	0.05000		115	70-130	3	25	
1,1-Dichloropropene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	2	25	
1,2,3-Trichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.3	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI90623 - 5035										
1,2,3-Trichloropropane	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	1	25	
1,2,4-Trichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	0.2	25	
1,2,4-Trimethylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
1,2-Dibromo-3-Chloropropane	0.0393	0.0050	mg/kg wet	0.05000		79	70-130	3	25	
1,2-Dibromoethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
1,2-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	0.8	25	
1,2-Dichloroethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	0.6	25	
1,2-Dichloropropane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,3,5-Trimethylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
1,3-Dichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,3-Dichloropropane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
1,4-Dichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.2	25	
1,4-Dioxane	1.01	0.100	mg/kg wet	1.000		101	70-130	5	20	
1-Chlorohexane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	5	25	
2,2-Dichloropropane	0.0571	0.0050	mg/kg wet	0.05000		114	70-130	1	25	
2-Butanone	0.256	0.0500	mg/kg wet	0.2500		102	70-130	2	25	
2-Chlorotoluene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
2-Hexanone	0.214	0.0500	mg/kg wet	0.2500		86	70-130	0.2	25	
4-Chlorotoluene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
4-Isopropyltoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	0.5	25	
4-Methyl-2-Pentanone	0.228	0.0500	mg/kg wet	0.2500		91	70-130	2	25	
Acetone	0.220	0.0500	mg/kg wet	0.2500		88	70-130	16	25	
Benzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Bromobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.6	25	
Bromochloromethane	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	0.3	25	
Bromodichloromethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.6	25	
Bromoform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Bromomethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130	0.2	25	
Carbon Disulfide	0.0590	0.0050	mg/kg wet	0.05000		118	70-130	3	25	
Carbon Tetrachloride	0.0585	0.0050	mg/kg wet	0.05000		117	70-130	2	25	
Chlorobenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
Chloroethane	0.0468	0.0100	mg/kg wet	0.05000		94	70-130	2	25	
Chloroform	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	1	25	
Chloromethane	0.0479	0.0100	mg/kg wet	0.05000		96	70-130	3	25	
cis-1,2-Dichloroethene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	1	25	
cis-1,3-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	1	25	
Dibromochloromethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	0.4	25	
Dibromomethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.3	25	
Dichlorodifluoromethane	0.0355	0.0100	mg/kg wet	0.05000		71	70-130	0.06	25	
Diethyl Ether	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	0.6	25	
Di-isopropyl ether	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Ethyl tertiary-butyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
Ethylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
Hexachlorobutadiene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	1	25	
Isopropylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI90623 - 5035										
Methyl tert-Butyl Ether	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Methylene Chloride	0.0495	0.0250	mg/kg wet	0.05000		99	70-130	3	25	
Naphthalene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
n-Butylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
n-Propylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
sec-Butylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
Styrene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
tert-Butylbenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Tertiary-amyl methyl ether	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	0.8	25	
Tetrachloroethene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	2	25	
Tetrahydrofuran	0.0425	0.0050	mg/kg wet	0.05000		85	70-130	5	25	
Toluene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	1	25	
trans-1,2-Dichloroethene	0.0567	0.0050	mg/kg wet	0.05000		113	70-130	3	25	
trans-1,3-Dichloropropene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
Trichlorofluoromethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Vinyl Acetate	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	3	25	
Vinyl Chloride	0.0516	0.0100	mg/kg wet	0.05000		103	70-130	1	25	
Xylene O	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130	4	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0404*		mg/kg wet	*0.05000*		*81*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0453*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0463*		mg/kg wet	*0.05000*		*93*	*70-130*			
Surrogate: Toluene-d8	*0.0449*		mg/kg wet	*0.05000*		*90*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CI90605 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							
Aroclor 1268	ND	0.02	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CI90605 - 3540C										
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0223*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0226*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0182*		mg/kg wet	*0.02500*		*73*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0179*		mg/kg wet	*0.02500*		*72*	*30-150*			
LCS										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		98	40-140			
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		96	40-140			
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		92	40-140			
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		85	40-140			
Surrogate: Decachlorobiphenyl	*0.0224*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0226*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0189*		mg/kg wet	*0.02500*		*76*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0172*		mg/kg wet	*0.02500*		*69*	*30-150*			
LCS Dup										
Aroclor 1016	0.4	0.05	mg/kg wet	0.5000		89	40-140	10	30	
Aroclor 1016 [2C]	0.4	0.05	mg/kg wet	0.5000		88	40-140	9	30	
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		86	40-140	7	30	
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		82	40-140	4	30	
Surrogate: Decachlorobiphenyl	*0.0212*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0213*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0168*		mg/kg wet	*0.02500*		*67*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0153*		mg/kg wet	*0.02500*		*61*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CI90615 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.61*		mg/kg wet	*5.000*		*92*	*40-140*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CI90615 - 3546										
LCS										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		74	40-140			
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		66	30-140			
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Total Petroleum Hydrocarbons	31.0	37.5	mg/kg wet	35.00		88	40-140			
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Surrogate: O-Terphenyl	*4.81*		mg/kg wet	*5.000*		*96*	*40-140*			
LCS Dup										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		75	40-140	1	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		92	40-140	2	25	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		81	40-140	2	25	
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		91	40-140	1	25	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		92	40-140	1	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		88	40-140	1	25	
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		95	40-140	1	25	
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		67	30-140	1	25	
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		92	40-140	1	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		91	40-140	1	25	
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		92	40-140	1	25	
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		84	40-140	0.7	25	
Total Petroleum Hydrocarbons	30.8	37.5	mg/kg wet	35.00		88	40-140	0.6	25	
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		93	40-140	1	25	
Surrogate: O-Terphenyl	*4.66*		mg/kg wet	*5.000*		*93*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.167	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.167	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.167	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.167	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.167	mg/kg wet							
Benzo(k)fluoranthene	ND	0.167	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.100	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.083	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.083	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.083	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.167	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.167	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.667	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.22*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.26*		mg/kg wet	*5.000*		*85*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.56*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.19*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: 2-Fluorophenol	*3.62*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.24*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: Phenol-d6	*3.46*		mg/kg wet	*5.000*		*69*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.53*		mg/kg wet	*3.333*		*76*	*30-130*			
LCS										
1,1-Biphenyl	2.19	0.333	mg/kg wet	3.333		66	40-140			
1,2,4-Trichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140			
1,2-Dichlorobenzene	2.00	0.333	mg/kg wet	3.333		60	40-140			
1,3-Dichlorobenzene	1.98	0.333	mg/kg wet	3.333		59	40-140			
1,4-Dichlorobenzene	1.96	0.333	mg/kg wet	3.333		59	40-140			
2,3,4,6-Tetrachlorophenol	2.54	1.67	mg/kg wet	3.333		76	30-130			
2,4,5-Trichlorophenol	2.58	0.333	mg/kg wet	3.333		77	30-130			
2,4,6-Trichlorophenol	2.50	0.333	mg/kg wet	3.333		75	30-130			
2,4-Dichlorophenol	2.47	0.333	mg/kg wet	3.333		74	30-130			
2,4-Dimethylphenol	2.34	0.333	mg/kg wet	3.333		70	30-130			
2,4-Dinitrophenol	2.59	1.67	mg/kg wet	3.333		78	30-130			
2,4-Dinitrotoluene	2.73	0.167	mg/kg wet	3.333		82	40-140			
2,6-Dinitrotoluene	2.52	0.333	mg/kg wet	3.333		76	40-140			
2-Chloronaphthalene	2.14	0.333	mg/kg wet	3.333		64	40-140			
2-Chlorophenol	2.10	0.333	mg/kg wet	3.333		63	30-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
2-Methylnaphthalene	2.13	0.333	mg/kg wet	3.333		64	40-140			
2-Methylphenol	2.20	0.333	mg/kg wet	3.333		66	30-130			
2-Nitroaniline	1.97	0.333	mg/kg wet	3.333		59	40-140			
2-Nitrophenol	2.17	0.333	mg/kg wet	3.333		65	30-130			
3,3´-Dichlorobenzidine	2.30	0.167	mg/kg wet	3.333		69	40-140			
3+4-Methylphenol	4.28	0.667	mg/kg wet	6.667		64	30-130			
3-Nitroaniline	2.32	0.333	mg/kg wet	3.333		70	40-140			
4,6-Dinitro-2-Methylphenol	2.68	1.67	mg/kg wet	3.333		81	30-130			
4-Bromophenyl-phenylether	2.68	0.333	mg/kg wet	3.333		80	40-140			
4-Chloro-3-Methylphenol	2.61	0.333	mg/kg wet	3.333		78	30-130			
4-Chloroaniline	1.63	0.667	mg/kg wet	3.333		49	40-140			
4-Chloro-phenyl-phenyl ether	2.60	0.333	mg/kg wet	3.333		78	40-140			
4-Nitroaniline	2.27	0.333	mg/kg wet	3.333		68	40-140			
4-Nitrophenol	2.50	1.67	mg/kg wet	3.333		75	30-130			
Acenaphthene	2.26	0.333	mg/kg wet	3.333		68	40-140			
Acenaphthylene	2.12	0.333	mg/kg wet	3.333		64	40-140			
Acetophenone	1.98	0.667	mg/kg wet	3.333		59	40-140			
Aniline	1.53	0.667	mg/kg wet	3.333		46	40-140			
Anthracene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Azobenzene	2.32	0.333	mg/kg wet	3.333		70	40-140			
Benzo(a)anthracene	2.74	0.167	mg/kg wet	3.333		82	40-140			
Benzo(a)pyrene	2.34	0.167	mg/kg wet	3.333		70	40-140			
Benzo(b)fluoranthene	2.38	0.167	mg/kg wet	3.333		71	40-140			
Benzo(g,h,i)perylene	2.48	0.167	mg/kg wet	3.333		74	40-140			
Benzo(k)fluoranthene	2.37	0.167	mg/kg wet	3.333		71	40-140			
Benzoic Acid	2.17	1.67	mg/kg wet	3.333		65	40-140			
Benzyl Alcohol	2.02	0.333	mg/kg wet	3.333		61	40-140			
bis(2-Chloroethoxy)methane	2.13	0.333	mg/kg wet	3.333		64	40-140			
bis(2-Chloroethyl)ether	2.00	0.100	mg/kg wet	3.333		60	40-140			
bis(2-chloroisopropyl)Ether	1.97	0.333	mg/kg wet	3.333		59	40-140			
bis(2-Ethylhexyl)phthalate	2.59	0.333	mg/kg wet	3.333		78	40-140			
Butylbenzylphthalate	2.52	0.333	mg/kg wet	3.333		76	40-140			
Carbazole	2.64	0.333	mg/kg wet	3.333		79	40-140			
Chrysene	2.43	0.083	mg/kg wet	3.333		73	40-140			
Dibenzo(a,h)Anthracene	2.52	0.083	mg/kg wet	3.333		76	40-140			
Dibenzofuran	2.33	0.333	mg/kg wet	3.333		70	40-140			
Diethylphthalate	2.83	0.333	mg/kg wet	3.333		85	40-140			
Dimethylphthalate	2.69	0.333	mg/kg wet	3.333		81	40-140			
Di-n-butylphthalate	2.86	0.333	mg/kg wet	3.333		86	40-140			
Di-n-octylphthalate	2.57	0.333	mg/kg wet	3.333		77	40-140			
Fluoranthene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Fluorene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Hexachlorobenzene	2.65	0.083	mg/kg wet	3.333		80	40-140			
Hexachlorobutadiene	2.20	0.333	mg/kg wet	3.333		66	40-140			
Hexachlorocyclopentadiene	1.38	1.67	mg/kg wet	3.333		41	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
Hexachloroethane	1.86	0.333	mg/kg wet	3.333		56	40-140			
Indeno(1,2,3-cd)Pyrene	2.53	0.167	mg/kg wet	3.333		76	40-140			
Isophorone	1.93	0.333	mg/kg wet	3.333		58	40-140			
Naphthalene	2.15	0.167	mg/kg wet	3.333		64	40-140			
Nitrobenzene	2.08	0.333	mg/kg wet	3.333		63	40-140			
N-Nitrosodimethylamine	1.86	0.333	mg/kg wet	3.333		56	40-140			
N-Nitroso-Di-n-Propylamine	2.17	0.333	mg/kg wet	3.333		65	40-140			
N-nitrosodiphenylamine	2.62	0.333	mg/kg wet	3.333		79	40-140			
Pentachlorophenol	2.75	0.667	mg/kg wet	3.333		82	30-130			
Phenanthrene	2.41	0.333	mg/kg wet	3.333		72	40-140			
Phenol	2.35	0.333	mg/kg wet	3.333		71	30-130			
Pyrene	2.42	0.333	mg/kg wet	3.333		73	40-140			
Pyridine	1.77	1.67	mg/kg wet	3.333		53	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.05*		mg/kg wet	*3.333*		*61*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.41*		mg/kg wet	*5.000*		*88*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.48*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.36*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2-Fluorophenol	*3.54*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.38*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: Phenol-d6	*3.55*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.76*		mg/kg wet	*3.333*		*83*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.22	0.333	mg/kg wet	3.333		67	40-140	1	30	
1,2,4-Trichlorobenzene	2.10	0.333	mg/kg wet	3.333		63	40-140	4	30	
1,2-Dichlorobenzene	1.91	0.333	mg/kg wet	3.333		57	40-140	5	30	
1,3-Dichlorobenzene	1.84	0.333	mg/kg wet	3.333		55	40-140	7	30	
1,4-Dichlorobenzene	1.82	0.333	mg/kg wet	3.333		55	40-140	7	30	
2,3,4,6-Tetrachlorophenol	2.62	1.67	mg/kg wet	3.333		79	30-130	3	30	
2,4,5-Trichlorophenol	2.67	0.333	mg/kg wet	3.333		80	30-130	3	30	
2,4,6-Trichlorophenol	2.58	0.333	mg/kg wet	3.333		77	30-130	3	30	
2,4-Dichlorophenol	2.57	0.333	mg/kg wet	3.333		77	30-130	4	30	
2,4-Dimethylphenol	2.45	0.333	mg/kg wet	3.333		74	30-130	5	30	
2,4-Dinitrophenol	2.89	1.67	mg/kg wet	3.333		87	30-130	11	30	
2,4-Dinitrotoluene	2.95	0.167	mg/kg wet	3.333		89	40-140	8	30	
2,6-Dinitrotoluene	2.62	0.333	mg/kg wet	3.333		78	40-140	4	30	
2-Chloronaphthalene	2.18	0.333	mg/kg wet	3.333		65	40-140	2	30	
2-Chlorophenol	2.10	0.333	mg/kg wet	3.333		63	30-130	0.1	30	
2-Methylnaphthalene	2.22	0.333	mg/kg wet	3.333		67	40-140	4	30	
2-Methylphenol	2.32	0.333	mg/kg wet	3.333		70	30-130	5	30	
2-Nitroaniline	2.15	0.333	mg/kg wet	3.333		65	40-140	9	30	
2-Nitrophenol	2.13	0.333	mg/kg wet	3.333		64	30-130	2	30	
3,3´-Dichlorobenzidine	2.50	0.167	mg/kg wet	3.333		75	40-140	8	30	
3+4-Methylphenol	4.53	0.667	mg/kg wet	6.667		68	30-130	6	30	
3-Nitroaniline	2.48	0.333	mg/kg wet	3.333		74	40-140	6	30	
4,6-Dinitro-2-Methylphenol	2.97	1.67	mg/kg wet	3.333		89	30-130	10	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
4-Bromophenyl-phenylether	2.86	0.333	mg/kg wet	3.333		86	40-140	7	30	
4-Chloro-3-Methylphenol	2.83	0.333	mg/kg wet	3.333		85	30-130	8	30	
4-Chloroaniline	1.76	0.667	mg/kg wet	3.333		53	40-140	8	30	
4-Chloro-phenyl-phenyl ether	2.66	0.333	mg/kg wet	3.333		80	40-140	2	30	
4-Nitroaniline	2.54	0.333	mg/kg wet	3.333		76	40-140	11	30	
4-Nitrophenol	2.68	1.67	mg/kg wet	3.333		80	30-130	7	30	
Acenaphthene	2.33	0.333	mg/kg wet	3.333		70	40-140	3	30	
Acenaphthylene	2.17	0.333	mg/kg wet	3.333		65	40-140	2	30	
Acetophenone	2.01	0.667	mg/kg wet	3.333		60	40-140	2	30	
Aniline	1.62	0.667	mg/kg wet	3.333		48	40-140	5	30	
Anthracene	2.76	0.333	mg/kg wet	3.333		83	40-140	7	30	
Azobenzene	2.43	0.333	mg/kg wet	3.333		73	40-140	5	30	
Benzo(a)anthracene	2.93	0.167	mg/kg wet	3.333		88	40-140	6	30	
Benzo(a)pyrene	2.44	0.167	mg/kg wet	3.333		73	40-140	4	30	
Benzo(b)fluoranthene	2.52	0.167	mg/kg wet	3.333		76	40-140	6	30	
Benzo(g,h,i)perylene	2.63	0.167	mg/kg wet	3.333		79	40-140	6	30	
Benzo(k)fluoranthene	2.52	0.167	mg/kg wet	3.333		76	40-140	6	30	
Benzoic Acid	2.41	1.67	mg/kg wet	3.333		72	40-140	11	30	
Benzyl Alcohol	2.11	0.333	mg/kg wet	3.333		63	40-140	4	30	
bis(2-Chloroethoxy)methane	2.15	0.333	mg/kg wet	3.333		65	40-140	1	30	
bis(2-Chloroethyl)ether	1.92	0.100	mg/kg wet	3.333		58	40-140	4	30	
bis(2-chloroisopropyl)Ether	1.94	0.333	mg/kg wet	3.333		58	40-140	2	30	
bis(2-Ethylhexyl)phthalate	2.77	0.333	mg/kg wet	3.333		83	40-140	7	30	
Butylbenzylphthalate	2.74	0.333	mg/kg wet	3.333		82	40-140	8	30	
Carbazole	2.86	0.333	mg/kg wet	3.333		86	40-140	8	30	
Chrysene	2.54	0.083	mg/kg wet	3.333		76	40-140	4	30	
Dibenzo(a,h)Anthracene	2.66	0.083	mg/kg wet	3.333		80	40-140	5	30	
Dibenzofuran	2.36	0.333	mg/kg wet	3.333		71	40-140	2	30	
Diethylphthalate	3.01	0.333	mg/kg wet	3.333		90	40-140	6	30	
Dimethylphthalate	2.80	0.333	mg/kg wet	3.333		84	40-140	4	30	
Di-n-butylphthalate	3.09	0.333	mg/kg wet	3.333		93	40-140	8	30	
Di-n-octylphthalate	2.70	0.333	mg/kg wet	3.333		81	40-140	5	30	
Fluoranthene	3.03	0.333	mg/kg wet	3.333		91	40-140	7	30	
Fluorene	2.62	0.333	mg/kg wet	3.333		79	40-140	4	30	
Hexachlorobenzene	2.81	0.083	mg/kg wet	3.333		84	40-140	6	30	
Hexachlorobutadiene	2.09	0.333	mg/kg wet	3.333		63	40-140	5	30	
Hexachlorocyclopentadiene	1.33	1.67	mg/kg wet	3.333		40	40-140	4	30	
Hexachloroethane	1.80	0.333	mg/kg wet	3.333		54	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	2.70	0.167	mg/kg wet	3.333		81	40-140	6	30	
Isophorone	2.00	0.333	mg/kg wet	3.333		60	40-140	3	30	
Naphthalene	2.11	0.167	mg/kg wet	3.333		63	40-140	2	30	
Nitrobenzene	2.06	0.333	mg/kg wet	3.333		62	40-140	1	30	
N-Nitrosodimethylamine	1.71	0.333	mg/kg wet	3.333		51	40-140	8	30	
N-Nitroso-Di-n-Propylamine	2.31	0.333	mg/kg wet	3.333		69	40-140	6	30	
N-nitrosodiphenylamine	2.75	0.333	mg/kg wet	3.333		82	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI90648 - 3546										
Pentachlorophenol	2.86	0.667	mg/kg wet	3.333		86	30-130	4	30	
Phenanthrene	2.57	0.333	mg/kg wet	3.333		77	40-140	6	30	
Phenol	2.42	0.333	mg/kg wet	3.333		72	30-130	3	30	
Pyrene	2.62	0.333	mg/kg wet	3.333		79	40-140	8	30	
Pyridine	1.63	1.67	mg/kg wet	3.333		49	40-140	8	30	
Surrogate: 1,2-Dichlorobenzene-d4	*1.90*		mg/kg wet	*3.333*		*57*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.39*		mg/kg wet	*5.000*		*88*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.37*		mg/kg wet	*5.000*		*67*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.36*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2-Fluorophenol	*3.36*		mg/kg wet	*5.000*		*67*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.22*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: Phenol-d6	*3.56*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.85*		mg/kg wet	*3.333*		*86*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0088

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19I0088
Date Received: 9/5/2019
Project Due Date: 9/12/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: 9/5/19 Time: Time: By:
    b. Low Level VOA vials frozen: Date: Time: 1825 By: JM

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	384638	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	384640	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	384643	Yes	NA	Yes	VOA Vial - Other	Other	
01	384644	Yes	NA	Yes	VOA Vial - Other	Other	
02	384637	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	384639	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	384641	Yes	NA	Yes	VOA Vial - Other	Other	
02	384642	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 9/5/19 1806
Reviewed By: Date & Time: 9/5/19 1825

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

ESS Project ID: 19I0088

Date Received: 9/5/2019

Delivered By: 9/5/19 1825

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #	19I0088
Reporting Limits	RIDEM Res Dec 1 5/1/96
Electonic Deliverables	☒ Data Checker ☒ Excel ☐ Other (Please Specify →)

Turn Time	5	Days
Regulatory State	RI	

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Company Name	Batz Group
Contact Person	Jar McLaughlin
Project #	
Project Name	NBC IIIA-4 and IIIA-5
Address	701 Grace Washington Hwy
City	Lincoln
State	RI
Zip Code	02865
PO #	
Telephone Number	401.333.2382
FAX Number	
Email Address	jmclaughlin@batz-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PP-13 Metals
1	9/3/19	10:15	Grab	Soil	B-8 0-2'	X	X	X	X	X
2	9/3/19	10:30	Grab	Soil	B-8 ~~3-4~~ 4'	X	X	X	X	X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V	AG
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*
Number of Containers per Sample:										3	1

Laboratory Use Only

Cooler Present: ✓ ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 0.3 Ice

Sampled by: Scott Nu

Comments: Please specify "Other" preservative and containers types in this space

20X Rule as per client jjs 9/6/19

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
9/5/19 10:00	9/5/19 10:00	9/5/19 15:54	9/5/19 1554
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #	19I0088
Reporting Limits	RIDEM Rev Dec 15 1996
Electonic Deliverables	☒ Data Checker ☒ Excel ☐ Other (Please Specify →)

Turn Time	5	Days
Regulatory State	RI	

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Company Name	Batz Group
Contact Person	Jar McLaughlin
Project #	
Project Name	NBC IIIA-4 and IIIA-5
Address	701 Grace Washington Hwy
City	Lincoln
State	RI
Zip Code	02865
PO #	
Telephone Number	401.333.2382
FAX Number	
Email Address	jmclaughlin@batz-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PP-13 Metals
1	9/3/19	10:15	Grab	Soil	B-8 0-2'	X	X	X	X	X
2	9/3/19	10:30	Grab	Soil	B-8 ~~2-4~~ 4'	X	X	X	X	X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V	AG
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*
Number of Containers per Sample:										3	1

Laboratory Use Only

Cooler Present: ✓ ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 0.3 Ice

Sampled by: Scott Nu

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
9/5/19 10:00	9/5/19 10:00	9/5/19 15:54	9/5/19 1554
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (N/A)
ESS Laboratory Work Order Number: 19I0654

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:10 pm, Sep 27, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

SAMPLE RECEIPT

The following samples were received on September 20, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 9/20/2019 at 14:42.

Lab Number	Sample Name	Matrix	Analysis
19I0654-01	B-6A 0-2ft	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D
19I0654-02	B-6A 2-9ft	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D
19I0654-03	B-6A 4-6ft	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D
19I0654-04	B-6A 6-10ft	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

PROJECT NARRATIVE

8270D Semi-Volatile Organic Compounds

C9I0387-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (94% @ 80-120%), 4,6-Dinitro-2-Methylphenol (91% @ 80-120%), Benzoic Acid (94% @ 80-120%), Di-n-octylphthalate (104% @ 80-120%), Pentachlorophenol (83% @ 80-120%)

C9I0387-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexachlorocyclopentadiene (25% @ 20%), N-Nitrosodimethylamine (26% @ 20%)

C9I0440-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (67% @ 80-120%), 4,6-Dinitro-2-Methylphenol (83% @ 80-120%), Pentachlorophenol (75% @ 80-120%)

C9I0440-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Di-n-octylphthalate (30% @ 20%), Phenol (24% @ 20%)

C9I0440-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2,4-Dinitrophenol (33% @ 20%), 4-Nitrophenol (34% @ 20%), Benzoic Acid (25% @ 20%), Hexachlorocyclopentadiene (25% @ 20%), N-Nitrosodimethylamine (22% @ 20%), Pentachlorophenol (25% @ 20%)

CI92028-BS1 **Blank Spike recovery is below lower control limit (B-).**
Aniline (37% @ 40-140%)

CI92028-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
4-Chloroaniline (38% @ 30%), Aniline (32% @ 30%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.33)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Arsenic	ND (2.16)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Beryllium	**0.29** (0.10)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Cadmium	ND (0.43)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Chromium	**4.25** (0.87)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Copper	**6.00** (2.16)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Lead	**5.87** (4.33)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Mercury	ND (0.029)		7471B		1	MKS	09/24/19 13:50	0.73	40	CI92367
Nickel	**5.96** (2.16)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Selenium	ND (4.33)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Silver	ND (0.43)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Thallium	ND (4.33)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366
Zinc	**33.5** (2.16)		6010C		1	KJK	09/24/19 23:29	2.49	100	CI92366

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,3-Dichloropropane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1,4-Dioxane	ND (0.0719)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
1-Chlorohexane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
2-Butanone	ND (0.0359)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
2-Chlorotoluene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
2-Hexanone	ND (0.0359)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
4-Chlorotoluene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
4-Isopropyltoluene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
4-Methyl-2-Pentanone	ND (0.0359)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Acetone	ND (0.0359)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Benzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Bromobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Bromodichloromethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Bromoform	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Bromomethane	ND (0.0072)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Carbon Disulfide	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Chlorobenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Chloroethane	ND (0.0072)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Chloroform	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Chloromethane	ND (0.0072)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
cis-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Dibromochloromethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Dibromomethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Dichlorodifluoromethane	ND (0.0072)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Diethyl Ether	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Di-isopropyl ether	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Ethylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Isopropylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Methylene Chloride	ND (0.0180)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Naphthalene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
n-Butylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
n-Propylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
sec-Butylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Styrene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
tert-Butylbenzene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Tetrachloroethene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Tetrahydrofuran	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
trans-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Trichloroethene	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Vinyl Acetate	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Vinyl Chloride	ND (0.0072)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Xylene O	ND (0.0036)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Xylene P,M	ND (0.0072)		8260B Low		1	09/20/19 19:40	C9I0371	CI92012
Xylenes (Total)	ND (0.00719)		8260B Low		1	09/20/19 19:40		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*119 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*101 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 19.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/20/19 19:50

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1221	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1232	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1242	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1248	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1254	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1260	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1262	ND (0.06)		8082A		1	09/23/19 15:06		CI92045
Aroclor 1268	ND (0.06)		8082A		1	09/23/19 15:06		CI92045

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*72 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*70 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*88 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 19.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/20/19 20:15

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (41.5)		8100M		1	09/25/19 5:56	C9I0398	CI92046

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*96 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
1,2,4-Trichlorobenzene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
1,2-Dichlorobenzene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
1,3-Dichlorobenzene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
1,4-Dichlorobenzene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,3,4,6-Tetrachlorophenol	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,4,5-Trichlorophenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,4,6-Trichlorophenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,4-Dichlorophenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,4-Dimethylphenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,4-Dinitrophenol	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,4-Dinitrotoluene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2,6-Dinitrotoluene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2-Chloronaphthalene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2-Chlorophenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2-Methylnaphthalene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2-Methylphenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2-Nitroaniline	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
2-Nitrophenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
3,3´-Dichlorobenzidine	ND (0.754)		8270D		1	09/26/19 0:24	C9I0440	CI92028
3+4-Methylphenol	ND (0.754)		8270D		1	09/26/19 0:24	C9I0440	CI92028
3-Nitroaniline	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4,6-Dinitro-2-Methylphenol	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4-Bromophenyl-phenylether	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4-Chloro-3-Methylphenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4-Chloroaniline	ND (0.754)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4-Chloro-phenyl-phenyl ether	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4-Nitroaniline	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
4-Nitrophenol	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Acenaphthene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Acenaphthylene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Acetophenone	ND (0.754)		8270D		1	09/26/19 0:24	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.754)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Anthracene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Azobenzene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzo(a)anthracene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzo(a)pyrene	ND (0.189)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzo(b)fluoranthene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzo(g,h,i)perylene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzo(k)fluoranthene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzoic Acid	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Benzyl Alcohol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
bis(2-Chloroethoxy)methane	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
bis(2-Chloroethyl)ether	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
bis(2-chloroisopropyl)Ether	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
bis(2-Ethylhexyl)phthalate	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Butylbenzylphthalate	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Carbazole	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Chrysene	ND (0.189)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Dibenzo(a,h)Anthracene	ND (0.189)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Dibenzofuran	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Diethylphthalate	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Dimethylphthalate	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Di-n-butylphthalate	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Di-n-octylphthalate	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Fluoranthene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Fluorene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Hexachlorobenzene	ND (0.189)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Hexachlorobutadiene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Hexachlorocyclopentadiene	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Hexachloroethane	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Indeno(1,2,3-cd)Pyrene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Isophorone	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Naphthalene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 0-2ft
Date Sampled: 09/18/19 08:00
Percent Solids: 93
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
N-Nitrosodimethylamine	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
N-Nitroso-Di-n-Propylamine	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
N-nitrosodiphenylamine	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Pentachlorophenol	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Phenanthrene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Phenol	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Pyrene	ND (0.376)		8270D		1	09/26/19 0:24	C9I0440	CI92028
Pyridine	ND (1.89)		8270D		1	09/26/19 0:24	C9I0440	CI92028

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*75 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*79 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*88 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*69 %*		*30-130*
Surrogate: 2-Fluorophenol	*89 %*		*30-130*
Surrogate: Nitrobenzene-d5	*87 %*		*30-130*
Surrogate: Phenol-d6	*95 %*		*30-130*
Surrogate: p-Terphenyl-d14	*95 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.20)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Arsenic	ND (2.60)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Beryllium	**0.33** (0.11)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Cadmium	ND (0.52)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Chromium	**7.43** (1.04)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Copper	**8.64** (2.60)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Lead	**7.03** (5.20)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Mercury	ND (0.033)		7471B		1	MKS	09/24/19 13:52	0.66	40	CI92367
Nickel	**8.49** (2.60)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Selenium	ND (5.20)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Silver	ND (0.52)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Thallium	ND (5.20)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366
Zinc	**37.2** (2.60)		6010C		1	KJK	09/24/19 23:34	2.1	100	CI92366

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 5.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2,4-Trimethylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,3,5-Trimethylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,3-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,4-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1,4-Dioxane	ND (0.0925)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
1-Chlorohexane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
2-Butanone	ND (0.0462)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
2-Chlorotoluene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
2-Hexanone	ND (0.0462)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
4-Chlorotoluene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
4-Methyl-2-Pentanone	ND (0.0462)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Acetone	ND (0.0462)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Benzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Bromobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 5.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Bromodichloromethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Bromoform	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Bromomethane	ND (0.0092)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Carbon Disulfide	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Chlorobenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Chloroethane	ND (0.0092)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Chloroform	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Chloromethane	ND (0.0092)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Dibromochloromethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Dibromomethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Dichlorodifluoromethane	ND (0.0092)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Diethyl Ether	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Di-isopropyl ether	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Ethylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Isopropylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Methylene Chloride	ND (0.0231)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Naphthalene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
n-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
n-Propylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
sec-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Styrene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
tert-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Tetrachloroethene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Tetrahydrofuran	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 5.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Trichloroethene	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Vinyl Acetate	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Vinyl Chloride	ND (0.0092)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Xylene O	ND (0.0046)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Xylene P,M	ND (0.0092)		8260B Low		1	09/20/19 20:06	C9I0371	CI92012
Xylenes (Total)	ND (0.00925)		8260B Low		1	09/20/19 20:06		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*118 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 20.7
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/20/19 19:50

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1221	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1232	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1242	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1248	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1254	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1260	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1262	ND (0.05)		8082A		1	09/23/19 15:25		CI92045
Aroclor 1268	ND (0.05)		8082A		1	09/23/19 15:25		CI92045

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*69 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*81 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*67 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*83 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 20.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/20/19 20:15

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**310** (79.9)		8100M		2	09/25/19 8:03	C9I0398	CI92046

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*86 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
1,2,4-Trichlorobenzene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
1,2-Dichlorobenzene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
1,3-Dichlorobenzene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
1,4-Dichlorobenzene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,3,4,6-Tetrachlorophenol	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,4,5-Trichlorophenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,4,6-Trichlorophenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,4-Dichlorophenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,4-Dimethylphenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,4-Dinitrophenol	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,4-Dinitrotoluene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2,6-Dinitrotoluene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2-Chloronaphthalene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2-Chlorophenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2-Methylnaphthalene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2-Methylphenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2-Nitroaniline	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
2-Nitrophenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
3,3´-Dichlorobenzidine	ND (0.709)		8270D		1	09/26/19 0:50	C9I0440	CI92028
3+4-Methylphenol	ND (0.709)		8270D		1	09/26/19 0:50	C9I0440	CI92028
3-Nitroaniline	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4,6-Dinitro-2-Methylphenol	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4-Bromophenyl-phenylether	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4-Chloro-3-Methylphenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4-Chloroaniline	ND (0.709)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4-Chloro-phenyl-phenyl ether	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4-Nitroaniline	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
4-Nitrophenol	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Acenaphthene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Acenaphthylene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Acetophenone	ND (0.709)		8270D		1	09/26/19 0:50	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.709)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Anthracene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Azobenzene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzo(a)anthracene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzo(a)pyrene	ND (0.178)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzo(b)fluoranthene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzo(g,h,i)perylene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzo(k)fluoranthene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzoic Acid	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Benzyl Alcohol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
bis(2-Chloroethoxy)methane	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
bis(2-Chloroethyl)ether	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
bis(2-chloroisopropyl)Ether	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
bis(2-Ethylhexyl)phthalate	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Butylbenzylphthalate	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Carbazole	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Chrysene	ND (0.178)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Dibenzo(a,h)Anthracene	ND (0.178)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Dibenzofuran	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Diethylphthalate	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Dimethylphthalate	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Di-n-butylphthalate	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Di-n-octylphthalate	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Fluoranthene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Fluorene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Hexachlorobenzene	ND (0.178)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Hexachlorobutadiene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Hexachlorocyclopentadiene	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Hexachloroethane	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Indeno(1,2,3-cd)Pyrene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Isophorone	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Naphthalene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 2-9ft
Date Sampled: 09/18/19 08:15
Percent Solids: 92
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
N-Nitrosodimethylamine	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
N-Nitroso-Di-n-Propylamine	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
N-nitrosodiphenylamine	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Pentachlorophenol	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Phenanthrene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Phenol	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Pyrene	ND (0.354)		8270D		1	09/26/19 0:50	C9I0440	CI92028
Pyridine	ND (1.78)		8270D		1	09/26/19 0:50	C9I0440	CI92028

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*80 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*73 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*95 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: 2-Fluorophenol	*95 %*		*30-130*
Surrogate: Nitrobenzene-d5	*88 %*		*30-130*
Surrogate: Phenol-d6	*97 %*		*30-130*
Surrogate: p-Terphenyl-d14	*95 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.56)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Arsenic	**5.11** (2.28)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Beryllium	**0.25** (0.10)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Cadmium	ND (0.46)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Chromium	**6.59** (0.91)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Copper	**10.6** (2.28)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Lead	**20.7** (4.56)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Mercury	**0.040** (0.027)		7471B		1	MKS	09/24/19 13:54	0.78	40	CI92367
Nickel	**8.41** (2.28)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Selenium	ND (4.56)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Silver	ND (0.46)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Thallium	ND (4.56)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366
Zinc	**29.9** (2.28)		6010C		1	KJK	09/24/19 23:38	2.35	100	CI92366

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1,4-Dioxane	ND (0.0799)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
2-Butanone	ND (0.0400)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
2-Hexanone	ND (0.0400)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
4-Methyl-2-Pentanone	ND (0.0400)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Acetone	ND (0.0400)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Benzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Bromobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Bromoform	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Bromomethane	ND (0.0080)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Chlorobenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Chloroethane	ND (0.0080)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Chloroform	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Chloromethane	ND (0.0080)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Dibromomethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Dichlorodifluoromethane	ND (0.0080)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Diethyl Ether	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Ethylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Methylene Chloride	ND (0.0200)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Naphthalene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Styrene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Trichloroethene	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Vinyl Chloride	ND (0.0080)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Xylene O	ND (0.0040)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Xylene P,M	ND (0.0080)		8260B Low		1	09/20/19 20:31	C9I0371	CI92012
Xylenes (Total)	ND (0.00799)		8260B Low		1	09/20/19 20:31		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*120 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*101 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 19.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/20/19 19:50

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1221	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1232	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1242	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1248	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1254	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1260	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1262	ND (0.05)		8082A		1	09/24/19 15:11		CI92045
Aroclor 1268 [2C]	ND (0.05)		8082A		1	09/24/19 15:11		CI92045

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*72 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*84 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*80 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*94 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 19.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/20/19 20:15

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (40.6)		8100M		1	09/25/19 6:27	C9I0398	CI92046

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*98 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
1,2,4-Trichlorobenzene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
1,2-Dichlorobenzene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
1,3-Dichlorobenzene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
1,4-Dichlorobenzene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,3,4,6-Tetrachlorophenol	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,4,5-Trichlorophenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,4,6-Trichlorophenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,4-Dichlorophenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,4-Dimethylphenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,4-Dinitrophenol	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,4-Dinitrotoluene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2,6-Dinitrotoluene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2-Chloronaphthalene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2-Chlorophenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2-Methylnaphthalene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2-Methylphenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2-Nitroaniline	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
2-Nitrophenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
3,3´-Dichlorobenzidine	ND (0.754)		8270D		1	09/26/19 1:16	C9I0440	CI92028
3+4-Methylphenol	ND (0.754)		8270D		1	09/26/19 1:16	C9I0440	CI92028
3-Nitroaniline	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4,6-Dinitro-2-Methylphenol	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4-Bromophenyl-phenylether	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4-Chloro-3-Methylphenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4-Chloroaniline	ND (0.754)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4-Chloro-phenyl-phenyl ether	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4-Nitroaniline	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
4-Nitrophenol	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Acenaphthene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Acenaphthylene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Acetophenone	ND (0.754)		8270D		1	09/26/19 1:16	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.754)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Anthracene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Azobenzene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzo(a)anthracene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzo(a)pyrene	ND (0.189)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzo(b)fluoranthene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzo(g,h,i)perylene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzo(k)fluoranthene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzoic Acid	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Benzyl Alcohol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
bis(2-Chloroethoxy)methane	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
bis(2-Chloroethyl)ether	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
bis(2-chloroisopropyl)Ether	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
bis(2-Ethylhexyl)phthalate	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Butylbenzylphthalate	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Carbazole	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Chrysene	ND (0.189)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Dibenzo(a,h)Anthracene	ND (0.189)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Dibenzofuran	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Diethylphthalate	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Dimethylphthalate	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Di-n-butylphthalate	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Di-n-octylphthalate	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Fluoranthene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Fluorene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Hexachlorobenzene	ND (0.189)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Hexachlorobutadiene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Hexachlorocyclopentadiene	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Hexachloroethane	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Indeno(1,2,3-cd)Pyrene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Isophorone	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Naphthalene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 4-6ft
Date Sampled: 09/18/19 08:30
Percent Solids: 93
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
N-Nitrosodimethylamine	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
N-Nitroso-Di-n-Propylamine	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
N-nitrosodiphenylamine	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Pentachlorophenol	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Phenanthrene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Phenol	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Pyrene	ND (0.377)		8270D		1	09/26/19 1:16	C9I0440	CI92028
Pyridine	ND (1.89)		8270D		1	09/26/19 1:16	C9I0440	CI92028

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*82 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*74 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*95 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*76 %*		*30-130*
Surrogate: 2-Fluorophenol	*98 %*		*30-130*
Surrogate: Nitrobenzene-d5	*93 %*		*30-130*
Surrogate: Phenol-d6	*99 %*		*30-130*
Surrogate: p-Terphenyl-d14	*94 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.16)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Arsenic	**3.49** (2.08)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Beryllium	**0.23** (0.09)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Cadmium	ND (0.42)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Chromium	**7.88** (0.83)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Copper	**18.8** (2.08)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Lead	**35.7** (4.16)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Mercury	**0.223** (0.027)		7471B		1	MKS	09/24/19 13:56	0.82	40	CI92367
Nickel	**9.14** (2.08)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Selenium	ND (4.16)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Silver	ND (0.42)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Thallium	ND (4.16)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366
Zinc	**31.3** (2.08)		6010C		1	KJK	09/24/19 23:42	2.73	100	CI92366

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 7.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,3-Dichloropropane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1,4-Dioxane	ND (0.0768)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
1-Chlorohexane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
2-Butanone	ND (0.0384)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
2-Chlorotoluene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
2-Hexanone	ND (0.0384)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
4-Chlorotoluene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
4-Isopropyltoluene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
4-Methyl-2-Pentanone	ND (0.0384)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Acetone	ND (0.0384)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Benzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Bromobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 7.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Bromodichloromethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Bromoform	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Bromomethane	ND (0.0077)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Carbon Disulfide	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Chlorobenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Chloroethane	ND (0.0077)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Chloroform	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Chloromethane	ND (0.0077)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
cis-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Dibromochloromethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Dibromomethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Dichlorodifluoromethane	ND (0.0077)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Diethyl Ether	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Di-isopropyl ether	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Ethylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Isopropylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Methylene Chloride	ND (0.0192)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Naphthalene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
n-Butylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
n-Propylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
sec-Butylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Styrene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
tert-Butylbenzene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Tetrachloroethene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Tetrahydrofuran	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 7.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
trans-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Trichloroethene	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Vinyl Acetate	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Vinyl Chloride	ND (0.0077)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Xylene O	ND (0.0038)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Xylene P,M	ND (0.0077)		8260B Low		1	09/23/19 14:31	C9I0405	CI92335
Xylenes (Total)	ND (0.00768)		8260B Low		1	09/23/19 14:31		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*111 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*89 %*		*70-130*
Surrogate: Dibromofluoromethane	*102 %*		*70-130*
Surrogate: Toluene-d8	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 19.3
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/20/19 19:50

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1221	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1232	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1242	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1248	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1254	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1260 [2C]	**0.2** (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1262	ND (0.06)		8082A		1	09/23/19 16:03		CI92045
Aroclor 1268	ND (0.06)		8082A		1	09/23/19 16:03		CI92045

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*65 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*81 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*60 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*85 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 19.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/20/19 20:15

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**60.3** (44.2)		8100M		1	09/25/19 6:59	C9I0398	CI92046

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*87 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
1,2,4-Trichlorobenzene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
1,2-Dichlorobenzene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
1,3-Dichlorobenzene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
1,4-Dichlorobenzene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,3,4,6-Tetrachlorophenol	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,4,5-Trichlorophenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,4,6-Trichlorophenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,4-Dichlorophenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,4-Dimethylphenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,4-Dinitrophenol	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,4-Dinitrotoluene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2,6-Dinitrotoluene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2-Chloronaphthalene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2-Chlorophenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2-Methylnaphthalene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2-Methylphenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2-Nitroaniline	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
2-Nitrophenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
3,3´-Dichlorobenzidine	ND (0.734)		8270D		1	09/26/19 1:42	C9I0440	CI92028
3+4-Methylphenol	ND (0.734)		8270D		1	09/26/19 1:42	C9I0440	CI92028
3-Nitroaniline	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4,6-Dinitro-2-Methylphenol	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4-Bromophenyl-phenylether	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4-Chloro-3-Methylphenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4-Chloroaniline	ND (0.734)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4-Chloro-phenyl-phenyl ether	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4-Nitroaniline	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
4-Nitrophenol	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Acenaphthene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Acenaphthylene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Acetophenone	ND (0.734)		8270D		1	09/26/19 1:42	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.734)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Anthracene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Azobenzene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzo(a)anthracene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzo(a)pyrene	**0.261** (0.184)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzo(b)fluoranthene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzo(g,h,i)perylene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzo(k)fluoranthene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzoic Acid	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Benzyl Alcohol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
bis(2-Chloroethoxy)methane	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
bis(2-Chloroethyl)ether	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
bis(2-chloroisopropyl)Ether	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
bis(2-Ethylhexyl)phthalate	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Butylbenzylphthalate	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Carbazole	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Chrysene	**0.262** (0.184)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Dibenzo(a,h)Anthracene	ND (0.184)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Dibenzofuran	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Diethylphthalate	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Dimethylphthalate	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Di-n-butylphthalate	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Di-n-octylphthalate	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Fluoranthene	**0.395** (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Fluorene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Hexachlorobenzene	ND (0.184)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Hexachlorobutadiene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Hexachlorocyclopentadiene	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Hexachloroethane	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Indeno(1,2,3-cd)Pyrene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Isophorone	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Naphthalene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-6A 6-10ft
Date Sampled: 09/18/19 11:45
Percent Solids: 88
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0654
ESS Laboratory Sample ID: 19I0654-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/20/19 20:26

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
N-Nitrosodimethylamine	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
N-Nitroso-Di-n-Propylamine	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
N-nitrosodiphenylamine	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Pentachlorophenol	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Phenanthrene	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Phenol	ND (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Pyrene	**0.482** (0.366)		8270D		1	09/26/19 1:42	C9I0440	CI92028
Pyridine	ND (1.84)		8270D		1	09/26/19 1:42	C9I0440	CI92028

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*76 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*60 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*86 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*71 %*		*30-130*
Surrogate: 2-Fluorophenol	*90 %*		*30-130*
Surrogate: Nitrobenzene-d5	*85 %*		*30-130*
Surrogate: Phenol-d6	*89 %*		*30-130*
Surrogate: p-Terphenyl-d14	*82 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI92366 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
LCS										
Antimony	35.1	12.7	mg/kg wet	42.40		83	80-120			
Arsenic	127	6.33	mg/kg wet	128.0		99	80-120			
Beryllium	202	0.28	mg/kg wet	217.0		93	80-120			
Cadmium	85.1	1.27	mg/kg wet	99.00		86	80-120			
Chromium	114	2.53	mg/kg wet	116.0		98	80-120			
Copper	88.6	6.33	mg/kg wet	89.60		99	80-120			
Lead	269	12.7	mg/kg wet	277.0		97	80-120			
Nickel	106	6.33	mg/kg wet	107.0		99	80-120			
Selenium	241	12.7	mg/kg wet	242.0		99	80-120			
Silver	62.0	1.27	mg/kg wet	64.30		96	80-120			
Thallium	171	12.7	mg/kg wet	183.0		94	80-120			
Zinc	540	6.33	mg/kg wet	561.0		96	80-120			
LCS Dup										
Antimony	36.1	12.7	mg/kg wet	42.40		85	80-120	3	20	
Arsenic	129	6.33	mg/kg wet	128.0		101	80-120	2	20	
Beryllium	205	0.28	mg/kg wet	217.0		95	80-120	2	20	
Cadmium	86.4	1.27	mg/kg wet	99.00		87	80-120	2	20	
Chromium	117	2.53	mg/kg wet	116.0		101	80-120	3	20	
Copper	90.8	6.33	mg/kg wet	89.60		101	80-120	2	20	
Lead	273	12.7	mg/kg wet	277.0		99	80-120	1	20	
Nickel	108	6.33	mg/kg wet	107.0		101	80-120	2	20	
Selenium	249	12.7	mg/kg wet	242.0		103	80-120	3	20	
Silver	62.7	1.27	mg/kg wet	64.30		97	80-120	1	20	
Thallium	172	12.7	mg/kg wet	183.0		94	80-120	0.3	20	
Zinc	548	6.33	mg/kg wet	561.0		98	80-120	1	20	
Batch CI92367 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	2.77	0.305	mg/kg wet	3.120		89	80-120			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI92367 - 7471B										
LCS Dup										
Mercury	2.78	0.264	mg/kg wet	3.120		89	80-120	0.6	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92012 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92012 - 5035										
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0524*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0503*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,1-Trichloroethane	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
1,1,2,2-Tetrachloroethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,2-Trichloroethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloroethane	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
1,1-Dichloroethene	0.0565	0.0050	mg/kg wet	0.05000		113	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92012 - 5035										
1,1-Dichloropropene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
1,2,3-Trichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,3-Trichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,2,4-Trimethylbenzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dibromo-3-Chloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromoethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichloroethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dichloropropane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,3,5-Trimethylbenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
1,3-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichloropropane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
1,4-Dichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,4-Dioxane	0.951	0.100	mg/kg wet	1.000		95	70-130			
1-Chlorohexane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
2,2-Dichloropropane	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
2-Butanone	0.268	0.0500	mg/kg wet	0.2500		107	70-130			
2-Chlorotoluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
2-Hexanone	0.250	0.0500	mg/kg wet	0.2500		100	70-130			
4-Chlorotoluene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
4-Isopropyltoluene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
4-Methyl-2-Pentanone	0.254	0.0500	mg/kg wet	0.2500		102	70-130			
Acetone	0.243	0.0500	mg/kg wet	0.2500		97	70-130			
Benzene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130			
Bromobenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Bromochloromethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Bromodichloromethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
Bromoform	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Bromomethane	0.0426	0.0100	mg/kg wet	0.05000		85	70-130			
Carbon Disulfide	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
Carbon Tetrachloride	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Chlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Chloroethane	0.0467	0.0100	mg/kg wet	0.05000		93	70-130			
Chloroform	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Chloromethane	0.0452	0.0100	mg/kg wet	0.05000		90	70-130			
cis-1,2-Dichloroethene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
cis-1,3-Dichloropropene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Dibromochloromethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
Dibromomethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
Dichlorodifluoromethane	0.0431	0.0100	mg/kg wet	0.05000		86	70-130			
Diethyl Ether	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
Di-isopropyl ether	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
Ethyl tertiary-butyl ether	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Ethylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92012 - 5035										
Hexachlorobutadiene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Isopropylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Methyl tert-Butyl Ether	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Methylene Chloride	0.0509	0.0250	mg/kg wet	0.05000		102	70-130			
Naphthalene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
n-Butylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
n-Propylbenzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
sec-Butylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Styrene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
tert-Butylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Tertiary-amyl methyl ether	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Tetrachloroethene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Tetrahydrofuran	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Toluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,2-Dichloroethene	0.0557	0.0050	mg/kg wet	0.05000		111	70-130			
trans-1,3-Dichloropropene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Trichloroethene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Trichlorofluoromethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
Vinyl Acetate	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Vinyl Chloride	0.0486	0.0100	mg/kg wet	0.05000		97	70-130			
Xylene O	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0511*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0499*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,1,1-Trichloroethane	0.0577	0.0050	mg/kg wet	0.05000		115	70-130	1	25	
1,1,2,2-Tetrachloroethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	7	25	
1,1,2-Trichloroethane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
1,1-Dichloroethane	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	0.7	25	
1,1-Dichloroethene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	0.2	25	
1,1-Dichloropropene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	0.6	25	
1,2,3-Trichlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
1,2,3-Trichloropropane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	6	25	
1,2,4-Trichlorobenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
1,2,4-Trimethylbenzene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	0.1	25	
1,2-Dibromo-3-Chloropropane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	13	25	
1,2-Dibromoethane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,2-Dichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	1	25	
1,2-Dichloroethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	3	25	
1,2-Dichloropropane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
1,3,5-Trimethylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	0.6	25	
1,3-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.04	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI92012 - 5035										
1,3-Dichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
1,4-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	0.8	25	
1,4-Dioxane	0.832	0.100	mg/kg wet	1.000		83	70-130	13	20	
1-Chlorohexane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
2,2-Dichloropropane	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	3	25	
2-Butanone	0.266	0.0500	mg/kg wet	0.2500		106	70-130	0.7	25	
2-Chlorotoluene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	1	25	
2-Hexanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130	10	25	
4-Chlorotoluene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	0.4	25	
4-Isopropyltoluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	0.3	25	
4-Methyl-2-Pentanone	0.239	0.0500	mg/kg wet	0.2500		96	70-130	6	25	
Acetone	0.253	0.0500	mg/kg wet	0.2500		101	70-130	4	25	
Benzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	1	25	
Bromobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
Bromochloromethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Bromodichloromethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
Bromoform	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Bromomethane	0.0427	0.0100	mg/kg wet	0.05000		85	70-130	0.3	25	
Carbon Disulfide	0.0568	0.0050	mg/kg wet	0.05000		114	70-130	1	25	
Carbon Tetrachloride	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	0.3	25	
Chlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Chloroethane	0.0467	0.0100	mg/kg wet	0.05000		93	70-130	0.09	25	
Chloroform	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	0.8	25	
Chloromethane	0.0455	0.0100	mg/kg wet	0.05000		91	70-130	0.7	25	
cis-1,2-Dichloroethene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	1	25	
cis-1,3-Dichloropropene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	0.7	25	
Dibromochloromethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
Dibromomethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
Dichlorodifluoromethane	0.0435	0.0100	mg/kg wet	0.05000		87	70-130	0.9	25	
Diethyl Ether	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Di-isopropyl ether	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	2	25	
Ethyl tertiary-butyl ether	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Ethylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
Hexachlorobutadiene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Isopropylbenzene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	0.6	25	
Methyl tert-Butyl Ether	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Methylene Chloride	0.0512	0.0250	mg/kg wet	0.05000		102	70-130	0.5	25	
Naphthalene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	6	25	
n-Butylbenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	2	25	
n-Propylbenzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	0.4	25	
sec-Butylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	0.2	25	
Styrene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
tert-Butylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	0.8	25	
Tertiary-amyl methyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Tetrachloroethene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92012 - 5035										
Tetrahydrofuran	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	11	25	
Toluene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
trans-1,2-Dichloroethene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130	0.1	25	
trans-1,3-Dichloropropene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Trichloroethene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	0.6	25	
Trichlorofluoromethane	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	0.3	25	
Vinyl Acetate	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	5	25	
Vinyl Chloride	0.0493	0.0100	mg/kg wet	0.05000		99	70-130	1	25	
Xylene O	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
Xylene P,M	0.104	0.0100	mg/kg wet	0.1000		104	70-130	2	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0512*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0494*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0503*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Toluene-d8	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Batch CI92335 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92335 - 5035										
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0522*		mg/kg wet	*0.05000*		*104*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92335 - 5035										
Surrogate: 4-Bromofluorobenzene	*0.0500*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0488*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0498*		mg/kg wet	*0.05000*		*100*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
1,1,1-Trichloroethane	0.0565	0.0050	mg/kg wet	0.05000		113	70-130			
1,1,2,2-Tetrachloroethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,2-Trichloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,1-Dichloroethane	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,1-Dichloroethene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
1,1-Dichloropropene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,3-Trichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,3-Trichloropropane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
1,2,4-Trichlorobenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,2,4-Trimethylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dibromo-3-Chloropropane	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
1,2-Dibromoethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloroethane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dichloropropane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,3,5-Trimethylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
1,3-Dichlorobenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichloropropane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
1,4-Dichlorobenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,4-Dioxane	0.862	0.100	mg/kg wet	1.000		86	70-130			
1-Chlorohexane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
2,2-Dichloropropane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
2-Butanone	0.253	0.0500	mg/kg wet	0.2500		101	70-130			
2-Chlorotoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
2-Hexanone	0.221	0.0500	mg/kg wet	0.2500		89	70-130			
4-Chlorotoluene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
4-Isopropyltoluene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
4-Methyl-2-Pentanone	0.234	0.0500	mg/kg wet	0.2500		94	70-130			
Acetone	0.220	0.0500	mg/kg wet	0.2500		88	70-130			
Benzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Bromobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Bromochloromethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Bromodichloromethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Bromoform	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Bromomethane	0.0418	0.0100	mg/kg wet	0.05000		84	70-130			
Carbon Disulfide	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
Carbon Tetrachloride	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Chlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Chloroethane	0.0451	0.0100	mg/kg wet	0.05000		90	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92335 - 5035										
Chloroform	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Chloromethane	0.0443	0.0100	mg/kg wet	0.05000		89	70-130			
cis-1,2-Dichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
cis-1,3-Dichloropropene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Dibromochloromethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Dibromomethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
Dichlorodifluoromethane	0.0420	0.0100	mg/kg wet	0.05000		84	70-130			
Diethyl Ether	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Di-isopropyl ether	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Ethyl tertiary-butyl ether	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Ethylbenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Hexachlorobutadiene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Isopropylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Methyl tert-Butyl Ether	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Methylene Chloride	0.0550	0.0250	mg/kg wet	0.05000		110	70-130			
Naphthalene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
n-Butylbenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
n-Propylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
sec-Butylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Styrene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
tert-Butylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Tertiary-amyl methyl ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Tetrachloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Tetrahydrofuran	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
Toluene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
trans-1,2-Dichloroethene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
trans-1,3-Dichloropropene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Trichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
Vinyl Acetate	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Vinyl Chloride	0.0478	0.0100	mg/kg wet	0.05000		96	70-130			
Xylene O	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Xylene P,M	0.102	0.0100	mg/kg wet	0.1000		102	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0516*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0495*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0505*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Toluene-d8	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
1,1,1-Trichloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	3	25	
1,1,2,2-Tetrachloroethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
1,1,2-Trichloroethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	3	25	
1,1-Dichloroethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	2	25	
1,1-Dichloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
1,1-Dichloropropene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	1	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI92335 - 5035										
1,2,3-Trichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.8	25	
1,2,3-Trichloropropane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	1	25	
1,2,4-Trichlorobenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.4	25	
1,2,4-Trimethylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	0.4	25	
1,2-Dibromo-3-Chloropropane	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	2	25	
1,2-Dibromoethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
1,2-Dichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	0.04	25	
1,2-Dichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
1,2-Dichloropropane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
1,3,5-Trimethylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	0.1	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
1,3-Dichloropropane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	0.4	25	
1,4-Dichlorobenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
1,4-Dioxane	0.827	0.100	mg/kg wet	1.000		83	70-130	4	20	
1-Chlorohexane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.04	25	
2,2-Dichloropropane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	4	25	
2-Chlorotoluene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
2-Hexanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130	1	25	
4-Chlorotoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	0.9	25	
4-Isopropyltoluene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	0.04	25	
4-Methyl-2-Pentanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130	3	25	
Acetone	0.212	0.0500	mg/kg wet	0.2500		85	70-130	3	25	
Benzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Bromobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.8	25	
Bromochloromethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
Bromodichloromethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Bromoform	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	0.6	25	
Bromomethane	0.0414	0.0100	mg/kg wet	0.05000		83	70-130	1	25	
Carbon Disulfide	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Carbon Tetrachloride	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Chlorobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Chloroethane	0.0446	0.0100	mg/kg wet	0.05000		89	70-130	1	25	
Chloroform	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
Chloromethane	0.0440	0.0100	mg/kg wet	0.05000		88	70-130	0.8	25	
cis-1,2-Dichloroethene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
cis-1,3-Dichloropropene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Dibromochloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	0.5	25	
Dibromomethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Dichlorodifluoromethane	0.0410	0.0100	mg/kg wet	0.05000		82	70-130	2	25	
Diethyl Ether	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Di-isopropyl ether	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Ethyl tertiary-butyl ether	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	3	25	
Ethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.4	25	
Hexachlorobutadiene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	0.3	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92335 - 5035										
Isopropylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	0.5	25	
Methyl tert-Butyl Ether	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
Methylene Chloride	0.0535	0.0250	mg/kg wet	0.05000		107	70-130	3	25	
Naphthalene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	1	25	
n-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	0.6	25	
n-Propylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	0	25	
sec-Butylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.2	25	
Styrene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	1	25	
tert-Butylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	0.5	25	
Tertiary-amyl methyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Tetrachloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	0.6	25	
Tetrahydrofuran	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	2	25	
Toluene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
trans-1,2-Dichloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	0.6	25	
trans-1,3-Dichloropropene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Trichloroethene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
Trichlorofluoromethane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
Vinyl Acetate	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	3	25	
Vinyl Chloride	0.0469	0.0100	mg/kg wet	0.05000		94	70-130	2	25	
Xylene O	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	1	25	
Xylene P,M	0.102	0.0100	mg/kg wet	0.1000		102	70-130	0.4	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0503*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0490*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0499*		mg/kg wet	*0.05000*		*100*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CI92045 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CI92045 - 3540C										
Aroclor 1268	ND	0.02	mg/kg wet							
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0210*		mg/kg wet	*0.02500*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0123*		mg/kg wet	*0.02500*		*49*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0177*		mg/kg wet	*0.02500*		*71*	*30-150*			
LCS										
Aroclor 1016	0.3	0.05	mg/kg wet	0.5000		67	40-140			
Aroclor 1016 [2C]	0.4	0.05	mg/kg wet	0.5000		79	40-140			
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		80	40-140			
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		81	40-140			
Surrogate: Decachlorobiphenyl	*0.0195*		mg/kg wet	*0.02500*		*78*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0211*		mg/kg wet	*0.02500*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0150*		mg/kg wet	*0.02500*		*60*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0180*		mg/kg wet	*0.02500*		*72*	*30-150*			
LCS Dup										
Aroclor 1016	0.3	0.05	mg/kg wet	0.5000		70	40-140	4	30	
Aroclor 1016 [2C]	0.4	0.05	mg/kg wet	0.5000		83	40-140	5	30	
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000		80	40-140	0.3	30	
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		82	40-140	0.5	30	
Surrogate: Decachlorobiphenyl	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0208*		mg/kg wet	*0.02500*		*83*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0156*		mg/kg wet	*0.02500*		*62*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0187*		mg/kg wet	*0.02500*		*75*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CI92046 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CI92046 - 3546										
Surrogate: O-Terphenyl	*4.97*		mg/kg wet	*5.000*		*99*	*40-140*			
LCS										
Decane (C10)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Dodecane (C12)	2.3	0.2	mg/kg wet	2.500		90	40-140			
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Nonane (C9)	1.9	0.2	mg/kg wet	2.500		75	30-140			
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		98	40-140			
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Total Petroleum Hydrocarbons	32.8	37.5	mg/kg wet	35.00		94	40-140			
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Surrogate: O-Terphenyl	*4.71*		mg/kg wet	*5.000*		*94*	*40-140*			
LCS Dup										
Decane (C10)	2.2	0.2	mg/kg wet	2.500		87	40-140	4	25	
Docosane (C22)	2.6	0.2	mg/kg wet	2.500		102	40-140	5	25	
Dodecane (C12)	2.4	0.2	mg/kg wet	2.500		94	40-140	4	25	
Eicosane (C20)	2.5	0.2	mg/kg wet	2.500		100	40-140	5	25	
Hexacosane (C26)	2.6	0.2	mg/kg wet	2.500		102	40-140	5	25	
Hexadecane (C16)	2.4	0.2	mg/kg wet	2.500		98	40-140	5	25	
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		105	40-140	4	25	
Nonane (C9)	1.9	0.2	mg/kg wet	2.500		78	30-140	3	25	
Octacosane (C28)	2.6	0.2	mg/kg wet	2.500		103	40-140	5	25	
Octadecane (C18)	2.5	0.2	mg/kg wet	2.500		100	40-140	5	25	
Tetracosane (C24)	2.6	0.2	mg/kg wet	2.500		102	40-140	5	25	
Tetradecane (C14)	2.4	0.2	mg/kg wet	2.500		97	40-140	4	25	
Total Petroleum Hydrocarbons	34.3	37.5	mg/kg wet	35.00		98	40-140	5	25	
Triacontane (C30)	2.6	0.2	mg/kg wet	2.500		103	40-140	5	25	
Surrogate: O-Terphenyl	*4.92*		mg/kg wet	*5.000*		*98*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.333	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.167	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.32*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.21*		mg/kg wet	*5.000*		*84*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.71*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.19*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: 2-Fluorophenol	*3.63*		mg/kg wet	*5.000*		*73*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.43*		mg/kg wet	*3.333*		*73*	*30-130*			
Surrogate: Phenol-d6	*3.62*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.08*		mg/kg wet	*3.333*		*92*	*30-130*			
LCS										
1,1-Biphenyl	2.08	0.333	mg/kg wet	3.333		62	40-140			
1,2,4-Trichlorobenzene	1.98	0.333	mg/kg wet	3.333		60	40-140			
1,2-Dichlorobenzene	1.93	0.333	mg/kg wet	3.333		58	40-140			
1,3-Dichlorobenzene	1.83	0.333	mg/kg wet	3.333		55	40-140			
1,4-Dichlorobenzene	1.87	0.333	mg/kg wet	3.333		56	40-140			
2,3,4,6-Tetrachlorophenol	2.41	1.67	mg/kg wet	3.333		72	30-130			
2,4,5-Trichlorophenol	2.47	0.333	mg/kg wet	3.333		74	30-130			
2,4,6-Trichlorophenol	2.44	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dichlorophenol	2.22	0.333	mg/kg wet	3.333		67	30-130			
2,4-Dimethylphenol	2.14	0.333	mg/kg wet	3.333		64	30-130			
2,4-Dinitrophenol	2.60	1.67	mg/kg wet	3.333		78	30-130			
2,4-Dinitrotoluene	2.89	0.333	mg/kg wet	3.333		87	40-140			
2,6-Dinitrotoluene	2.57	0.333	mg/kg wet	3.333		77	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
2-Chloronaphthalene	2.07	0.333	mg/kg wet	3.333		62	40-140			
2-Chlorophenol	1.98	0.333	mg/kg wet	3.333		59	30-130			
2-Methylnaphthalene	1.96	0.333	mg/kg wet	3.333		59	40-140			
2-Methylphenol	1.92	0.333	mg/kg wet	3.333		58	30-130			
2-Nitroaniline	1.93	0.333	mg/kg wet	3.333		58	40-140			
2-Nitrophenol	1.97	0.333	mg/kg wet	3.333		59	30-130			
3,3´-Dichlorobenzidine	2.40	0.667	mg/kg wet	3.333		72	40-140			
3+4-Methylphenol	4.04	0.667	mg/kg wet	6.667		61	30-130			
3-Nitroaniline	2.32	0.333	mg/kg wet	3.333		70	40-140			
4,6-Dinitro-2-Methylphenol	2.89	1.67	mg/kg wet	3.333		87	30-130			
4-Bromophenyl-phenylether	2.68	0.333	mg/kg wet	3.333		80	40-140			
4-Chloro-3-Methylphenol	2.54	0.333	mg/kg wet	3.333		76	30-130			
4-Chloroaniline	1.50	0.667	mg/kg wet	3.333		45	40-140			
4-Chloro-phenyl-phenyl ether	2.52	0.333	mg/kg wet	3.333		75	40-140			
4-Nitroaniline	2.43	0.333	mg/kg wet	3.333		73	40-140			
4-Nitrophenol	2.39	1.67	mg/kg wet	3.333		72	30-130			
Acenaphthene	2.14	0.333	mg/kg wet	3.333		64	40-140			
Acenaphthylene	2.17	0.333	mg/kg wet	3.333		65	40-140			
Acetophenone	1.86	0.667	mg/kg wet	3.333		56	40-140			
Aniline	1.24	0.667	mg/kg wet	3.333		37	40-140			B-
Anthracene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Azobenzene	2.34	0.333	mg/kg wet	3.333		70	40-140			
Benzo(a)anthracene	3.07	0.333	mg/kg wet	3.333		92	40-140			
Benzo(a)pyrene	2.60	0.167	mg/kg wet	3.333		78	40-140			
Benzo(b)fluoranthene	2.98	0.333	mg/kg wet	3.333		89	40-140			
Benzo(g,h,i)perylene	2.91	0.333	mg/kg wet	3.333		87	40-140			
Benzo(k)fluoranthene	2.40	0.333	mg/kg wet	3.333		72	40-140			
Benzoic Acid	2.34	1.67	mg/kg wet	3.333		70	40-140			
Benzyl Alcohol	1.75	0.333	mg/kg wet	3.333		52	40-140			
bis(2-Chloroethoxy)methane	1.94	0.333	mg/kg wet	3.333		58	40-140			
bis(2-Chloroethyl)ether	1.98	0.333	mg/kg wet	3.333		60	40-140			
bis(2-chloroisopropyl)Ether	2.00	0.333	mg/kg wet	3.333		60	40-140			
bis(2-Ethylhexyl)phthalate	2.82	0.333	mg/kg wet	3.333		85	40-140			
Butylbenzylphthalate	2.88	0.333	mg/kg wet	3.333		86	40-140			
Carbazole	2.82	0.333	mg/kg wet	3.333		85	40-140			
Chrysene	2.69	0.167	mg/kg wet	3.333		81	40-140			
Dibenzo(a,h)Anthracene	3.02	0.167	mg/kg wet	3.333		91	40-140			
Dibenzofuran	2.21	0.333	mg/kg wet	3.333		66	40-140			
Diethylphthalate	2.87	0.333	mg/kg wet	3.333		86	40-140			
Dimethylphthalate	2.63	0.333	mg/kg wet	3.333		79	40-140			
Di-n-butylphthalate	3.11	0.333	mg/kg wet	3.333		93	40-140			
Di-n-octylphthalate	2.70	0.333	mg/kg wet	3.333		81	40-140			
Fluoranthene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Fluorene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Hexachlorobenzene	2.75	0.167	mg/kg wet	3.333		82	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
Hexachlorobutadiene	2.03	0.333	mg/kg wet	3.333		61	40-140			
Hexachlorocyclopentadiene	1.38	1.67	mg/kg wet	3.333		41	40-140			
Hexachloroethane	1.86	0.333	mg/kg wet	3.333		56	40-140			
Indeno(1,2,3-cd)Pyrene	3.03	0.333	mg/kg wet	3.333		91	40-140			
Isophorone	1.87	0.333	mg/kg wet	3.333		56	40-140			
Naphthalene	1.96	0.333	mg/kg wet	3.333		59	40-140			
Nitrobenzene	1.95	0.333	mg/kg wet	3.333		59	40-140			
N-Nitrosodimethylamine	1.33	0.333	mg/kg wet	3.333		40	40-140			
N-Nitroso-Di-n-Propylamine	1.92	0.333	mg/kg wet	3.333		58	40-140			
N-nitrosodiphenylamine	2.61	0.333	mg/kg wet	3.333		78	40-140			
Pentachlorophenol	2.64	1.67	mg/kg wet	3.333		79	30-130			
Phenanthrene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Phenol	2.06	0.333	mg/kg wet	3.333		62	30-130			
Pyrene	2.75	0.333	mg/kg wet	3.333		83	40-140			
Pyridine	1.49	1.67	mg/kg wet	3.333		45	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.98*		mg/kg wet	*3.333*		*59*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.42*		mg/kg wet	*5.000*		*88*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.21*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.23*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: 2-Fluorophenol	*3.18*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.15*		mg/kg wet	*3.333*		*64*	*30-130*			
Surrogate: Phenol-d6	*3.15*		mg/kg wet	*5.000*		*63*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.04*		mg/kg wet	*3.333*		*91*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.43	0.333	mg/kg wet	3.333		73	40-140	16	30	
1,2,4-Trichlorobenzene	2.33	0.333	mg/kg wet	3.333		70	40-140	16	30	
1,2-Dichlorobenzene	2.31	0.333	mg/kg wet	3.333		69	40-140	18	30	
1,3-Dichlorobenzene	2.18	0.333	mg/kg wet	3.333		65	40-140	17	30	
1,4-Dichlorobenzene	2.26	0.333	mg/kg wet	3.333		68	40-140	19	30	
2,3,4,6-Tetrachlorophenol	2.77	1.67	mg/kg wet	3.333		83	30-130	14	30	
2,4,5-Trichlorophenol	2.87	0.333	mg/kg wet	3.333		86	30-130	15	30	
2,4,6-Trichlorophenol	2.81	0.333	mg/kg wet	3.333		84	30-130	14	30	
2,4-Dichlorophenol	2.63	0.333	mg/kg wet	3.333		79	30-130	17	30	
2,4-Dimethylphenol	2.53	0.333	mg/kg wet	3.333		76	30-130	16	30	
2,4-Dinitrophenol	2.94	1.67	mg/kg wet	3.333		88	30-130	12	30	
2,4-Dinitrotoluene	3.36	0.333	mg/kg wet	3.333		101	40-140	15	30	
2,6-Dinitrotoluene	2.92	0.333	mg/kg wet	3.333		88	40-140	13	30	
2-Chloronaphthalene	2.43	0.333	mg/kg wet	3.333		73	40-140	16	30	
2-Chlorophenol	2.44	0.333	mg/kg wet	3.333		73	30-130	21	30	
2-Methylnaphthalene	2.35	0.333	mg/kg wet	3.333		71	40-140	18	30	
2-Methylphenol	2.44	0.333	mg/kg wet	3.333		73	30-130	24	30	
2-Nitroaniline	2.24	0.333	mg/kg wet	3.333		67	40-140	15	30	
2-Nitrophenol	2.34	0.333	mg/kg wet	3.333		70	30-130	17	30	
3,3´-Dichlorobenzidine	2.75	0.667	mg/kg wet	3.333		82	40-140	13	30	
3+4-Methylphenol	5.02	0.667	mg/kg wet	6.667		75	30-130	22	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
3-Nitroaniline	2.82	0.333	mg/kg wet	3.333		85	40-140	19	30	
4,6-Dinitro-2-Methylphenol	3.08	1.67	mg/kg wet	3.333		92	30-130	6	30	
4-Bromophenyl-phenylether	2.98	0.333	mg/kg wet	3.333		90	40-140	11	30	
4-Chloro-3-Methylphenol	2.93	0.333	mg/kg wet	3.333		88	30-130	14	30	
4-Chloroaniline	2.19	0.667	mg/kg wet	3.333		66	40-140	38	30	D+
4-Chloro-phenyl-phenyl ether	2.86	0.333	mg/kg wet	3.333		86	40-140	13	30	
4-Nitroaniline	2.72	0.333	mg/kg wet	3.333		82	40-140	11	30	
4-Nitrophenol	2.67	1.67	mg/kg wet	3.333		80	30-130	11	30	
Acenaphthene	2.50	0.333	mg/kg wet	3.333		75	40-140	15	30	
Acenaphthylene	2.51	0.333	mg/kg wet	3.333		75	40-140	15	30	
Acetophenone	2.31	0.667	mg/kg wet	3.333		69	40-140	21	30	
Aniline	1.71	0.667	mg/kg wet	3.333		51	40-140	32	30	D+
Anthracene	3.07	0.333	mg/kg wet	3.333		92	40-140	12	30	
Azobenzene	2.64	0.333	mg/kg wet	3.333		79	40-140	12	30	
Benzo(a)anthracene	3.37	0.333	mg/kg wet	3.333		101	40-140	10	30	
Benzo(a)pyrene	2.85	0.167	mg/kg wet	3.333		85	40-140	9	30	
Benzo(b)fluoranthene	2.88	0.333	mg/kg wet	3.333		86	40-140	3	30	
Benzo(g,h,i)perylene	3.10	0.333	mg/kg wet	3.333		93	40-140	6	30	
Benzo(k)fluoranthene	3.07	0.333	mg/kg wet	3.333		92	40-140	24	30	
Benzoic Acid	2.61	1.67	mg/kg wet	3.333		78	40-140	11	30	
Benzyl Alcohol	2.24	0.333	mg/kg wet	3.333		67	40-140	25	30	
bis(2-Chloroethoxy)methane	2.34	0.333	mg/kg wet	3.333		70	40-140	18	30	
bis(2-Chloroethyl)ether	2.51	0.333	mg/kg wet	3.333		75	40-140	23	30	
bis(2-chloroisopropyl)Ether	2.41	0.333	mg/kg wet	3.333		72	40-140	19	30	
bis(2-Ethylhexyl)phthalate	3.22	0.333	mg/kg wet	3.333		97	40-140	13	30	
Butylbenzylphthalate	3.21	0.333	mg/kg wet	3.333		96	40-140	11	30	
Carbazole	3.08	0.333	mg/kg wet	3.333		93	40-140	9	30	
Chrysene	2.94	0.167	mg/kg wet	3.333		88	40-140	9	30	
Dibenzo(a,h)Anthracene	3.21	0.167	mg/kg wet	3.333		96	40-140	6	30	
Dibenzofuran	2.56	0.333	mg/kg wet	3.333		77	40-140	15	30	
Diethylphthalate	3.23	0.333	mg/kg wet	3.333		97	40-140	12	30	
Dimethylphthalate	3.04	0.333	mg/kg wet	3.333		91	40-140	15	30	
Di-n-butylphthalate	3.45	0.333	mg/kg wet	3.333		104	40-140	10	30	
Di-n-octylphthalate	2.99	0.333	mg/kg wet	3.333		90	40-140	10	30	
Fluoranthene	3.22	0.333	mg/kg wet	3.333		97	40-140	8	30	
Fluorene	2.96	0.333	mg/kg wet	3.333		89	40-140	15	30	
Hexachlorobenzene	2.99	0.167	mg/kg wet	3.333		90	40-140	8	30	
Hexachlorobutadiene	2.40	0.333	mg/kg wet	3.333		72	40-140	17	30	
Hexachlorocyclopentadiene	1.63	1.67	mg/kg wet	3.333		49	40-140	17	30	
Hexachloroethane	2.22	0.333	mg/kg wet	3.333		67	40-140	18	30	
Indeno(1,2,3-cd)Pyrene	3.20	0.333	mg/kg wet	3.333		96	40-140	5	30	
Isophorone	2.21	0.333	mg/kg wet	3.333		66	40-140	17	30	
Naphthalene	2.30	0.333	mg/kg wet	3.333		69	40-140	16	30	
Nitrobenzene	2.28	0.333	mg/kg wet	3.333		68	40-140	15	30	
N-Nitrosodimethylamine	1.61	0.333	mg/kg wet	3.333		48	40-140	19	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92028 - 3546										
N-Nitroso-Di-n-Propylamine	2.34	0.333	mg/kg wet	3.333		70	40-140	20	30	
N-nitrosodiphenylamine	2.84	0.333	mg/kg wet	3.333		85	40-140	8	30	
Pentachlorophenol	2.88	1.67	mg/kg wet	3.333		86	30-130	9	30	
Phenanthrene	2.78	0.333	mg/kg wet	3.333		83	40-140	8	30	
Phenol	2.56	0.333	mg/kg wet	3.333		77	30-130	22	30	
Pyrene	3.06	0.333	mg/kg wet	3.333		92	40-140	11	30	
Pyridine	1.82	1.67	mg/kg wet	3.333		55	40-140	20	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.31*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.85*		mg/kg wet	*5.000*		*97*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.81*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.49*		mg/kg wet	*3.333*		*75*	*30-130*			
Surrogate: 2-Fluorophenol	*3.74*		mg/kg wet	*5.000*		*75*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.49*		mg/kg wet	*3.333*		*75*	*30-130*			
Surrogate: Phenol-d6	*3.80*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.31*		mg/kg wet	*3.333*		*99*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0654

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910654
Date Received: 9/20/2019
Project Due Date: 9/27/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: .7 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 9/20/19 Time: 1402 By: [illegible]

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	390094	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	390098	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	390105	Yes	NA	Yes	VOA Vial - Other	Other	
01	390106	Yes	NA	Yes	VOA Vial - Other	Other	
02	390093	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	390097	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	390103	Yes	NA	Yes	VOA Vial - Other	Other	
02	390104	Yes	NA	Yes	VOA Vial - Other	Other	
03	390092	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	390096	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	390101	Yes	NA	Yes	VOA Vial - Other	Other	
03	390102	Yes	NA	Yes	VOA Vial - Other	Other	
04	390091	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	390095	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	390099	Yes	NA	Yes	VOA Vial - Other	Other	
04	390100	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review
Were all containers scanned into storage/lab? Initials [illegible]
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

ESS Project ID: 1910654
Date Received: 9/20/2019

Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 9/20/19 14:30
Reviewed By: _____ Date & Time: 9/20/19 1443
Delivered By: _____ 9/20/19 1443

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1910654

Turn Time: Std Rush:
Regulatory State: RI
Is this project for any of the following?: ☐ MA-MCP ☐ CT-RCP ☐ RGP ☐ Remediation

Reporting Limits: RIDEM ResDEC/ICDEC

Electonic Deliverables: ☒ Limit Checker ☒ Excel ☐ Other (Please Specifiy) →

Company Name	Project #	Project Name
Betz Group	6412	NBC IIIA-4 and IIIA-5

Contact Person	Address
Joe McLoughlin	701 George Washington Hwy

City	State	Zip Code	PO #
Lincoln	RI	02865	

Telephone Number	FAX Number	Email Address
401.333.2382		jmcloughlin@betz-inc.com

Analysis

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PP-13 Metals
1	9/18/19	8:00	Grab	Soil	B-6A 0-2'	X	X	X	X	X
2	9/18/19	8:15			B-6A 2-4'	X	X	X	X	X
3	9/18/19	8:30			B-6A 4-6'	X	X	X	X	X
4	9/18/19	11:45			B-6A 6-10'	X	X	X	X	X

Container Type: AG-Amber Glass B-BOD Bottle G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*

	VOCs	SVOCs	TPH	PCBs	PP-13 Metals
Container Type	ag	ag			
Preservation Code	6/10	1			
Number of Containers	3	1			

Laboratory Use Only

Cooler Present: ✓
Seals Intact:
Cooler Temperature: 0.1 °C

Sampled by : Scott Nee

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
9/20/19 9:50	9/20/19 9:50	9/20/19 11:42	9/20/19 14:15
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (6912)
ESS Laboratory Work Order Number: 19I0291

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:19 pm, Sep 18, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

SAMPLE RECEIPT

The following samples were received on September 11, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on September 11, 2019 at 13:43.

Lab Number	Sample Name	Matrix	Analysis
19I0291-01	B-8 4-6ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19I0291-02	B-8 6-10ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

CI91217-BS1 **Blank Spike recovery is below lower control limit (B-).**
1,2-Dibromo-3-Chloropropane (66% @ 70-130%), 2-Hexanone (69% @ 70-130%), Dichlorodifluoromethane (64% @ 70-130%)

CI91217-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Dichlorodifluoromethane (67% @ 70-130%)

8270D Semi-Volatile Organic Compounds

C9I0252-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (70% @ 80-120%), 4,6-Dinitro-2-Methylphenol (83% @ 80-120%), Benzoic Acid (69% @ 80-120%), Pentachlorophenol (77% @ 80-120%)

C9I0252-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2,4-Dinitrophenol (30% @ 20%), Benzoic Acid (31% @ 20%), Hexachlorocyclopentadiene (23% @ 20%), Pentachlorophenol (23% @ 20%)

CI91213-BS1 **Blank Spike recovery is below lower control limit (B-).**
Hexachlorocyclopentadiene (39% @ 40-140%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.96)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Arsenic	**16.8** (2.48)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Beryllium	**0.33** (0.11)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Cadmium	ND (0.50)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Chromium	**14.3** (0.99)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Copper	**37.5** (2.48)		6010C		1	KJK	09/16/19 21:24	2.23	100	CI91302
Lead	**68.0** (4.96)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Mercury	**0.068** (0.019)		7471B		1	MKS	09/16/19 11:37	1.14	40	CI91323
Nickel	**14.6** (2.48)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Selenium	ND (0.50)		6020A		1	NAR	09/17/19 15:01	2.23	100	CI91302
Silver	ND (0.50)		6010C		1	KJK	09/14/19 5:13	2.23	100	CI91302
Thallium	ND (0.50)		6020A		1	NAR	09/17/19 15:01	2.23	100	CI91302
Zinc	**87.9** (2.48)		6010C		1	KJK	09/16/19 21:24	2.23	100	CI91302

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,1,1-Trichloroethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,1,2,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,1,2-Trichloroethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,1-Dichloroethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,1-Dichloroethene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,1-Dichloropropene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2,3-Trichlorobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2,3-Trichloropropane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2,4-Trichlorobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2,4-Trimethylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2-Dibromo-3-Chloropropane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2-Dibromoethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2-Dichlorobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2-Dichloroethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,2-Dichloropropane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,3,5-Trimethylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,3-Dichlorobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,3-Dichloropropane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,4-Dichlorobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1,4-Dioxane	ND (0.0738)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
1-Chlorohexane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
2,2-Dichloropropane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
2-Butanone	ND (0.0369)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
2-Chlorotoluene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
2-Hexanone	ND (0.0369)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
4-Chlorotoluene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
4-Isopropyltoluene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
4-Methyl-2-Pentanone	ND (0.0369)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Acetone	ND (0.0369)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Benzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Bromobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Bromodichloromethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Bromoform	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Bromomethane	ND (0.0074)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Carbon Disulfide	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Carbon Tetrachloride	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Chlorobenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Chloroethane	ND (0.0074)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Chloroform	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Chloromethane	ND (0.0074)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
cis-1,2-Dichloroethene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
cis-1,3-Dichloropropene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Dibromochloromethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Dibromomethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Dichlorodifluoromethane	ND (0.0074)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Diethyl Ether	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Di-isopropyl ether	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Ethyl tertiary-butyl ether	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Ethylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Hexachlorobutadiene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Isopropylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Methyl tert-Butyl Ether	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Methylene Chloride	ND (0.0185)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Naphthalene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
n-Butylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
n-Propylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
sec-Butylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Styrene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
tert-Butylbenzene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Tertiary-amyl methyl ether	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Tetrachloroethene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Tetrahydrofuran	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 7.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
trans-1,2-Dichloroethene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
trans-1,3-Dichloropropene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Trichloroethene	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Trichlorofluoromethane	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Vinyl Acetate	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Vinyl Chloride	ND (0.0074)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Xylene O	ND (0.0037)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Xylene P,M	ND (0.0074)		8260B Low		1	09/12/19 20:12	C9I0210	CI91217
Xylenes (Total)	ND (0.00738)		8260B Low		1	09/12/19 20:12		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*95 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*93 %*		*70-130*
Surrogate: Dibromofluoromethane	*100 %*		*70-130*
Surrogate: Toluene-d8	*91 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 19.9
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/12/19 15:50

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1221	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1232	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1242	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1248	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1254	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1260	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1262	ND (0.06)		8082A		1	09/16/19 11:35		CI91208
Aroclor 1268	ND (0.06)		8082A		1	09/16/19 11:35		CI91208

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*74 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*72 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*64 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*71 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 20.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/12/19 10:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**59.6** (40.1)		8100M		1	09/13/19 19:13	C9I0178	CI91215

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*79 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/12/19 11:55

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
1,2,4-Trichlorobenzene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
1,2-Dichlorobenzene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
1,3-Dichlorobenzene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
1,4-Dichlorobenzene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,3,4,6-Tetrachlorophenol	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,4,5-Trichlorophenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,4,6-Trichlorophenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,4-Dichlorophenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,4-Dimethylphenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,4-Dinitrophenol	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,4-Dinitrotoluene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2,6-Dinitrotoluene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2-Chloronaphthalene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2-Chlorophenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2-Methylnaphthalene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2-Methylphenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2-Nitroaniline	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
2-Nitrophenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
3,3′-Dichlorobenzidine	ND (0.775)		8270D		1	09/14/19 20:33	C9I0252	CI91213
3+4-Methylphenol	ND (0.775)		8270D		1	09/14/19 20:33	C9I0252	CI91213
3-Nitroaniline	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4,6-Dinitro-2-Methylphenol	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4-Bromophenyl-phenylether	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4-Chloro-3-Methylphenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4-Chloroaniline	ND (0.775)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4-Chloro-phenyl-phenyl ether	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4-Nitroaniline	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
4-Nitrophenol	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Acenaphthene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Acenaphthylene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Acetophenone	ND (0.775)		8270D		1	09/14/19 20:33	C9I0252	CI91213

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/12/19 11:55

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.775)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Anthracene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Azobenzene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzo(a)anthracene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzo(a)pyrene	**0.385** (0.194)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzo(b)fluoranthene	**0.481** (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzo(g,h,i)perylene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzo(k)fluoranthene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzoic Acid	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Benzyl Alcohol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
bis(2-Chloroethoxy)methane	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
bis(2-Chloroethyl)ether	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
bis(2-chloroisopropyl)Ether	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
bis(2-Ethylhexyl)phthalate	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Butylbenzylphthalate	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Carbazole	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Chrysene	**0.453** (0.194)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Dibenzo(a,h)Anthracene	ND (0.194)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Dibenzofuran	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Diethylphthalate	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Dimethylphthalate	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Di-n-butylphthalate	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Di-n-octylphthalate	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Fluoranthene	**0.834** (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Fluorene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Hexachlorobenzene	ND (0.194)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Hexachlorobutadiene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Hexachlorocyclopentadiene	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Hexachloroethane	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Indeno(1,2,3-cd)Pyrene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Isophorone	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Naphthalene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 4-6ft
Date Sampled: 09/10/19 09:15
Percent Solids: 90
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/12/19 11:55

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
N-Nitrosodimethylamine	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
N-Nitroso-Di-n-Propylamine	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
N-nitrosodiphenylamine	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Pentachlorophenol	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Phenanthrene	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Phenol	ND (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Pyrene	**0.825** (0.387)		8270D		1	09/14/19 20:33	C9I0252	CI91213
Pyridine	ND (1.94)		8270D		1	09/14/19 20:33	C9I0252	CI91213

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*67 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*79 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*76 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*68 %*		*30-130*
Surrogate: 2-Fluorophenol	*73 %*		*30-130*
Surrogate: Nitrobenzene-d5	*67 %*		*30-130*
Surrogate: Phenol-d6	*79 %*		*30-130*
Surrogate: p-Terphenyl-d14	*106 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.91)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Arsenic	**12.4** (2.45)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Beryllium	**0.35** (0.11)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Cadmium	ND (0.49)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Chromium	**14.1** (0.98)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Copper	**37.5** (2.45)		6010C		1	KJK	09/16/19 21:27	2.26	100	CI91302
Lead	**67.8** (4.91)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Mercury	**0.074** (0.015)		7471B		1	MKS	09/16/19 11:39	1.43	40	CI91323
Nickel	**16.3** (2.45)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Selenium	ND (0.49)		6020A		1	NAR	09/17/19 15:06	2.26	100	CI91302
Silver	ND (0.49)		6010C		1	KJK	09/14/19 5:16	2.26	100	CI91302
Thallium	ND (0.49)		6020A		1	NAR	09/17/19 15:06	2.26	100	CI91302
Zinc	**79.3** (2.45)		6010C		1	KJK	09/16/19 21:27	2.26	100	CI91302

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,3-Dichloropropane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1,4-Dioxane	ND (0.0693)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
1-Chlorohexane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
2-Butanone	ND (0.0346)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
2-Chlorotoluene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
2-Hexanone	ND (0.0346)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
4-Chlorotoluene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
4-Isopropyltoluene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
4-Methyl-2-Pentanone	ND (0.0346)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Acetone	ND (0.0346)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Benzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Bromobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Bromodichloromethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Bromoform	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Bromomethane	ND (0.0069)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Carbon Disulfide	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Chlorobenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Chloroethane	ND (0.0069)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Chloroform	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Chloromethane	ND (0.0069)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
cis-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Dibromochloromethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Dibromomethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Dichlorodifluoromethane	ND (0.0069)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Diethyl Ether	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Di-isopropyl ether	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Ethylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Isopropylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Methylene Chloride	ND (0.0173)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Naphthalene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
n-Butylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
n-Propylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
sec-Butylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Styrene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
tert-Butylbenzene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Tetrachloroethene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Tetrahydrofuran	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
trans-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Trichloroethene	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Vinyl Acetate	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Vinyl Chloride	ND (0.0069)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Xylene O	ND (0.0035)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Xylene P,M	ND (0.0069)		8260B Low		1	09/12/19 20:37	C9I0210	CI91217
Xylenes (Total)	ND (0.00693)		8260B Low		1	09/12/19 20:37		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*97 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*92 %*		*70-130*
Surrogate: Dibromofluoromethane	*103 %*		*70-130*
Surrogate: Toluene-d8	*87 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 20.8
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/12/19 15:50

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1221	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1232	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1242	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1248	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1254	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1260	ND (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1262	**0.1** (0.05)		8082A		1	09/16/19 11:52		CI91208
Aroclor 1268	ND (0.05)		8082A		1	09/16/19 11:52		CI91208

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*84 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*70 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*81 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 20.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 9/12/19 10:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**68.6** (39.8)		8100M		1	09/13/19 21:02	C9I0178	CI91215

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*82 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/12/19 11:55

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
1,2,4-Trichlorobenzene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
1,2-Dichlorobenzene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
1,3-Dichlorobenzene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
1,4-Dichlorobenzene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,3,4,6-Tetrachlorophenol	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,4,5-Trichlorophenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,4,6-Trichlorophenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,4-Dichlorophenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,4-Dimethylphenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,4-Dinitrophenol	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,4-Dinitrotoluene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2,6-Dinitrotoluene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2-Chloronaphthalene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2-Chlorophenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2-Methylnaphthalene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2-Methylphenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2-Nitroaniline	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
2-Nitrophenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
3,3´-Dichlorobenzidine	ND (0.792)		8270D		1	09/14/19 22:00	C9I0252	CI91213
3+4-Methylphenol	ND (0.792)		8270D		1	09/14/19 22:00	C9I0252	CI91213
3-Nitroaniline	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4,6-Dinitro-2-Methylphenol	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4-Bromophenyl-phenylether	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4-Chloro-3-Methylphenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4-Chloroaniline	ND (0.792)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4-Chloro-phenyl-phenyl ether	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4-Nitroaniline	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
4-Nitrophenol	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Acenaphthene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Acenaphthylene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Acetophenone	ND (0.792)		8270D		1	09/14/19 22:00	C9I0252	CI91213

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/12/19 11:55

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.792)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Anthracene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Azobenzene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzo(a)anthracene	**0.473** (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzo(a)pyrene	**0.559** (0.198)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzo(b)fluoranthene	**0.625** (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzo(g,h,i)perylene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzo(k)fluoranthene	**0.523** (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzoic Acid	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Benzyl Alcohol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
bis(2-Chloroethoxy)methane	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
bis(2-Chloroethyl)ether	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
bis(2-chloroisopropyl)Ether	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
bis(2-Ethylhexyl)phthalate	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Butylbenzylphthalate	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Carbazole	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Chrysene	**0.616** (0.198)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Dibenzo(a,h)Anthracene	ND (0.198)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Dibenzofuran	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Diethylphthalate	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Dimethylphthalate	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Di-n-butylphthalate	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Di-n-octylphthalate	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Fluoranthene	**1.01** (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Fluorene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Hexachlorobenzene	ND (0.198)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Hexachlorobutadiene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Hexachlorocyclopentadiene	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Hexachloroethane	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Indeno(1,2,3-cd)Pyrene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Isophorone	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Naphthalene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-8 6-10ft
Date Sampled: 09/10/19 09:45
Percent Solids: 90
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0291
ESS Laboratory Sample ID: 19I0291-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/12/19 11:55

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
N-Nitrosodimethylamine	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
N-Nitroso-Di-n-Propylamine	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
N-nitrosodiphenylamine	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Pentachlorophenol	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Phenanthrene	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Phenol	ND (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Pyrene	**1.07** (0.396)		8270D		1	09/14/19 22:00	C9I0252	CI91213
Pyridine	ND (1.98)		8270D		1	09/14/19 22:00	C9I0252	CI91213

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*50 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*74 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*60 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*55 %*		*30-130*
Surrogate: 2-Fluorophenol	*57 %*		*30-130*
Surrogate: Nitrobenzene-d5	*51 %*		*30-130*
Surrogate: Phenol-d6	*64 %*		*30-130*
Surrogate: p-Terphenyl-d14	*102 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				Total Metals						
Batch CI91302 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Selenium	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	39.8	19.6	mg/kg wet	42.40		94	80-120			
Arsenic	126	9.80	mg/kg wet	128.0		98	80-120			
Beryllium	206	0.43	mg/kg wet	217.0		95	80-120			
Cadmium	86.4	1.96	mg/kg wet	99.00		87	80-120			
Chromium	111	3.92	mg/kg wet	116.0		95	80-120			
Copper	88.4	9.80	mg/kg wet	89.60		99	80-120			
Lead	266	19.6	mg/kg wet	277.0		96	80-120			
Nickel	111	9.80	mg/kg wet	107.0		104	80-120			
Silver	60.2	1.96	mg/kg wet	64.30		94	80-120			
Zinc	526	9.80	mg/kg wet	561.0		94	80-120			
LCS										
Selenium	256	9.80	mg/kg wet	242.0		106	80-120			
Thallium	189	9.80	mg/kg wet	183.0		104	80-120			
LCS Dup										
Antimony	41.0	17.9	mg/kg wet	42.40		97	80-120	3	20	
Arsenic	128	8.93	mg/kg wet	128.0		100	80-120	2	20	
Beryllium	201	0.39	mg/kg wet	217.0		93	80-120	2	20	
Cadmium	85.4	1.79	mg/kg wet	99.00		86	80-120	1	20	
Chromium	110	3.57	mg/kg wet	116.0		95	80-120	0.7	20	
Copper	89.5	8.93	mg/kg wet	89.60		100	80-120	1	20	
Lead	263	17.9	mg/kg wet	277.0		95	80-120	1	20	
Nickel	110	8.93	mg/kg wet	107.0		103	80-120	0.8	20	
Silver	59.2	1.79	mg/kg wet	64.30		92	80-120	2	20	
Zinc	521	8.93	mg/kg wet	561.0		93	80-120	0.9	20	
LCS Dup										
Selenium	245	8.93	mg/kg wet	242.0		101	80-120	4	30	
Thallium	183	8.93	mg/kg wet	183.0		100	80-120	3	30	
Reference										
Lead	3740	19.2	mg/kg wet	4490		83	83-113			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI91323 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	2.80	0.325	mg/kg wet	3.120		90	80-120			
LCS Dup										
Mercury	2.64	0.296	mg/kg wet	3.120		85	80-120	6	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91217 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91217 - 5035										
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0454*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0437*		mg/kg wet	*0.05000*		*87*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0433*		mg/kg wet	*0.05000*		*87*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91217 - 5035										
1,1,1-Trichloroethane	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,1,2,2-Tetrachloroethane	0.0372	0.0050	mg/kg wet	0.05000		74	70-130			
1,1,2-Trichloroethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
1,1-Dichloroethane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloroethene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
1,1-Dichloropropene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
1,2,3-Trichlorobenzene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
1,2,3-Trichloropropane	0.0374	0.0050	mg/kg wet	0.05000		75	70-130			
1,2,4-Trichlorobenzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
1,2,4-Trimethylbenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dibromo-3-Chloropropane	0.0332	0.0050	mg/kg wet	0.05000		66	70-130			B-
1,2-Dibromoethane	0.0415	0.0050	mg/kg wet	0.05000		83	70-130			
1,2-Dichlorobenzene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
1,2-Dichloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dichloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,3,5-Trimethylbenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
1,3-Dichlorobenzene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
1,3-Dichloropropane	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
1,4-Dichlorobenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,4-Dioxane	0.818	0.100	mg/kg wet	1.000		82	70-130			
1-Chlorohexane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
2,2-Dichloropropane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
2-Butanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130			
2-Chlorotoluene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
2-Hexanone	0.174	0.0500	mg/kg wet	0.2500		69	70-130			B-
4-Chlorotoluene	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
4-Isopropyltoluene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
4-Methyl-2-Pentanone	0.201	0.0500	mg/kg wet	0.2500		80	70-130			
Acetone	0.198	0.0500	mg/kg wet	0.2500		79	70-130			
Benzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Bromobenzene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Bromochloromethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Bromodichloromethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Bromoform	0.0410	0.0050	mg/kg wet	0.05000		82	70-130			
Bromomethane	0.0462	0.0100	mg/kg wet	0.05000		92	70-130			
Carbon Disulfide	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
Carbon Tetrachloride	0.0575	0.0050	mg/kg wet	0.05000		115	70-130			
Chlorobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Chloroethane	0.0448	0.0100	mg/kg wet	0.05000		90	70-130			
Chloroform	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Chloromethane	0.0448	0.0100	mg/kg wet	0.05000		90	70-130			
cis-1,2-Dichloroethene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
cis-1,3-Dichloropropene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Dibromochloromethane	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Dibromomethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91217 - 5035										
Dichlorodifluoromethane	0.0318	0.0100	mg/kg wet	0.05000		64	70-130			B-
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Di-isopropyl ether	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Ethyl tertiary-butyl ether	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Ethylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Hexachlorobutadiene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Isopropylbenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Methyl tert-Butyl Ether	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methylene Chloride	0.0496	0.0250	mg/kg wet	0.05000		99	70-130			
Naphthalene	0.0379	0.0050	mg/kg wet	0.05000		76	70-130			
n-Butylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
n-Propylbenzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
sec-Butylbenzene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
Tertiary-amyl methyl ether	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
Tetrachloroethene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Tetrahydrofuran	0.0373	0.0050	mg/kg wet	0.05000		75	70-130			
Toluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
trans-1,2-Dichloroethene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
trans-1,3-Dichloropropene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Trichloroethene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Trichlorofluoromethane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Vinyl Acetate	0.0392	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Chloride	0.0496	0.0100	mg/kg wet	0.05000		99	70-130			
Xylene O	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
Xylene P,M	0.0997	0.0100	mg/kg wet	0.1000		100	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0402*		mg/kg wet	*0.05000*		*80*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0461*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0476*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: Toluene-d8	*0.0428*		mg/kg wet	*0.05000*		*86*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
1,1,1-Trichloroethane	0.0586	0.0050	mg/kg wet	0.05000		117	70-130	6	25	
1,1,2,2-Tetrachloroethane	0.0417	0.0050	mg/kg wet	0.05000		83	70-130	11	25	
1,1,2-Trichloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
1,1-Dichloroethane	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	7	25	
1,1-Dichloroethene	0.0597	0.0050	mg/kg wet	0.05000		119	70-130	8	25	
1,1-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	7	25	
1,2,3-Trichlorobenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	7	25	
1,2,3-Trichloropropane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	13	25	
1,2,4-Trichlorobenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
1,2,4-Trimethylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
1,2-Dibromo-3-Chloropropane	0.0380	0.0050	mg/kg wet	0.05000		76	70-130	14	25	
1,2-Dibromoethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	12	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91217 - 5035										
1,2-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
1,2-Dichloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
1,2-Dichloropropane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	8	25	
1,3,5-Trimethylbenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	7	25	
1,3-Dichlorobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
1,3-Dichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
1,4-Dichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	8	25	
1,4-Dioxane	0.986	0.100	mg/kg wet	1.000		99	70-130	19	20	
1-Chlorohexane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	11	25	
2,2-Dichloropropane	0.0588	0.0050	mg/kg wet	0.05000		118	70-130	6	25	
2-Butanone	0.269	0.0500	mg/kg wet	0.2500		108	70-130	13	25	
2-Chlorotoluene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
2-Hexanone	0.210	0.0500	mg/kg wet	0.2500		84	70-130	19	25	
4-Chlorotoluene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
4-Isopropyltoluene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	7	25	
4-Methyl-2-Pentanone	0.236	0.0500	mg/kg wet	0.2500		94	70-130	16	25	
Acetone	0.234	0.0500	mg/kg wet	0.2500		94	70-130	16	25	
Benzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	7	25	
Bromobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	7	25	
Bromochloromethane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	10	25	
Bromodichloromethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
Bromoform	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	11	25	
Bromomethane	0.0488	0.0100	mg/kg wet	0.05000		98	70-130	5	25	
Carbon Disulfide	0.0603	0.0050	mg/kg wet	0.05000		121	70-130	7	25	
Carbon Tetrachloride	0.0614	0.0050	mg/kg wet	0.05000		123	70-130	6	25	
Chlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	8	25	
Chloroethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	10	25	
Chloroform	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	7	25	
Chloromethane	0.0469	0.0100	mg/kg wet	0.05000		94	70-130	5	25	
cis-1,2-Dichloroethene	0.0570	0.0050	mg/kg wet	0.05000		114	70-130	7	25	
cis-1,3-Dichloropropene	0.0557	0.0050	mg/kg wet	0.05000		111	70-130	8	25	
Dibromochloromethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	10	25	
Dibromomethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
Dichlorodifluoromethane	0.0337	0.0100	mg/kg wet	0.05000		67	70-130	6	25	B-
Diethyl Ether	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	11	25	
Di-isopropyl ether	0.0553	0.0050	mg/kg wet	0.05000		111	70-130	9	25	
Ethyl tertiary-butyl ether	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
Ethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
Hexachlorobutadiene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
Isopropylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
Methyl tert-Butyl Ether	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
Methylene Chloride	0.0535	0.0250	mg/kg wet	0.05000		107	70-130	8	25	
Naphthalene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	13	25	
n-Butylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
n-Propylbenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	8	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91217 - 5035										
sec-Butylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	7	25	
Styrene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
tert-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
Tertiary-amyl methyl ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
Tetrachloroethene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	9	25	
Tetrahydrofuran	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	18	25	
Toluene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	8	25	
trans-1,2-Dichloroethene	0.0577	0.0050	mg/kg wet	0.05000		115	70-130	8	25	
trans-1,3-Dichloropropene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	9	25	
Trichloroethene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	8	25	
Trichlorofluoromethane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	7	25	
Vinyl Acetate	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	13	25	
Vinyl Chloride	0.0519	0.0100	mg/kg wet	0.05000		104	70-130	4	25	
Xylene O	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
Xylene P,M	0.110	0.0100	mg/kg wet	0.1000		110	70-130	10	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0405*		mg/kg wet	*0.05000*		*81*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0466*		mg/kg wet	*0.05000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0472*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Toluene-d8	*0.0436*		mg/kg wet	*0.05000*		*87*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CI91208 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							
Aroclor 1268	ND	0.02	mg/kg wet							
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0199*		mg/kg wet	*0.02500*		*80*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0246*		mg/kg wet	*0.02500*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0175*		mg/kg wet	*0.02500*		*70*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CI91208 - 3540C										
Surrogate: Tetrachloro-m-xylene [2C]	*0.0221*		mg/kg wet	*0.02500*		*88*	*30-150*			
LCS										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		97	40-140			
Aroclor 1016 [2C]	0.6	0.05	mg/kg wet	0.5000		115	40-140			
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		105	40-140			
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		106	40-140			
Surrogate: Decachlorobiphenyl	*0.0257*		mg/kg wet	*0.02500*		*103*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0257*		mg/kg wet	*0.02500*		*103*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0228*		mg/kg wet	*0.02500*		*91*	*30-150*			
LCS Dup										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		99	40-140	2	30	
Aroclor 1016 [2C]	0.6	0.05	mg/kg wet	0.5000		118	40-140	3	30	
Aroclor 1260	0.6	0.05	mg/kg wet	0.5000		111	40-140	6	30	
Aroclor 1260 [2C]	0.6	0.05	mg/kg wet	0.5000		110	40-140	4	30	
Surrogate: Decachlorobiphenyl	*0.0236*		mg/kg wet	*0.02500*		*95*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0262*		mg/kg wet	*0.02500*		*105*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0198*		mg/kg wet	*0.02500*		*79*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0235*		mg/kg wet	*0.02500*		*94*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CI91215 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.21*		mg/kg wet	*5.000*		*84*	*40-140*			
LCS										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		73	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		81	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CI91215 - 3546										
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		78	40-140			
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		66	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Total Petroleum Hydrocarbons	27.2	37.5	mg/kg wet	35.00		78	40-140			
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Surrogate: O-Terphenyl	*4.17*		mg/kg wet	*5.000*		*83*	*40-140*			
LCS Dup										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		76	40-140	4	25	
Docosane (C22)	2.1	0.2	mg/kg wet	2.500		83	40-140	3	25	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		80	40-140	4	25	
Eicosane (C20)	2.1	0.2	mg/kg wet	2.500		82	40-140	1	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		81	40-140	3	25	
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	25	
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		86	40-140	2	25	
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		67	30-140	3	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		81	40-140	3	25	
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		82	40-140	2	25	
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		82	40-140	3	25	
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		80	40-140	4	25	
Total Petroleum Hydrocarbons	28.0	37.5	mg/kg wet	35.00		80	40-140	3	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		81	40-140	3	25	
Surrogate: O-Terphenyl	*4.19*		mg/kg wet	*5.000*		*84*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CI91213 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91213 - 3546										
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI91213 - 3546										
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.34*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.01*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.88*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.30*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2-Fluorophenol	*3.88*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.31*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: Phenol-d6	*4.04*		mg/kg wet	*5.000*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.14*		mg/kg wet	*3.333*		*94*	*30-130*			
LCS										
1,1-Biphenyl	2.01	0.333	mg/kg wet	3.333		60	40-140			
1,2,4-Trichlorobenzene	2.14	0.333	mg/kg wet	3.333		64	40-140			
1,2-Dichlorobenzene	2.26	0.333	mg/kg wet	3.333		68	40-140			
1,3-Dichlorobenzene	2.14	0.333	mg/kg wet	3.333		64	40-140			
1,4-Dichlorobenzene	2.21	0.333	mg/kg wet	3.333		66	40-140			
2,3,4,6-Tetrachlorophenol	2.40	1.67	mg/kg wet	3.333		72	30-130			
2,4,5-Trichlorophenol	2.48	0.333	mg/kg wet	3.333		74	30-130			
2,4,6-Trichlorophenol	2.22	0.333	mg/kg wet	3.333		67	30-130			
2,4-Dichlorophenol	2.34	0.333	mg/kg wet	3.333		70	30-130			
2,4-Dimethylphenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
2,4-Dinitrophenol	2.20	1.67	mg/kg wet	3.333		66	30-130			
2,4-Dinitrotoluene	3.01	0.333	mg/kg wet	3.333		90	40-140			
2,6-Dinitrotoluene	2.59	0.333	mg/kg wet	3.333		78	40-140			
2-Chloronaphthalene	2.07	0.333	mg/kg wet	3.333		62	40-140			
2-Chlorophenol	2.33	0.333	mg/kg wet	3.333		70	30-130			
2-Methylnaphthalene	2.17	0.333	mg/kg wet	3.333		65	40-140			
2-Methylphenol	2.36	0.333	mg/kg wet	3.333		71	30-130			
2-Nitroaniline	2.31	0.333	mg/kg wet	3.333		69	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91213 - 3546										
2-Nitrophenol	2.08	0.333	mg/kg wet	3.333		62	30-130			
3,3´-Dichlorobenzidine	2.45	0.667	mg/kg wet	3.333		73	40-140			
3+4-Methylphenol	4.83	0.667	mg/kg wet	6.667		73	30-130			
3-Nitroaniline	2.81	0.333	mg/kg wet	3.333		84	40-140			
4,6-Dinitro-2-Methylphenol	2.78	1.67	mg/kg wet	3.333		83	30-130			
4-Bromophenyl-phenylether	2.55	0.333	mg/kg wet	3.333		76	40-140			
4-Chloro-3-Methylphenol	2.71	0.333	mg/kg wet	3.333		81	30-130			
4-Chloroaniline	1.59	0.667	mg/kg wet	3.333		48	40-140			
4-Chloro-phenyl-phenyl ether	2.56	0.333	mg/kg wet	3.333		77	40-140			
4-Nitroaniline	2.79	0.333	mg/kg wet	3.333		84	40-140			
4-Nitrophenol	2.88	1.67	mg/kg wet	3.333		86	30-130			
Acenaphthene	2.21	0.333	mg/kg wet	3.333		66	40-140			
Acenaphthylene	2.14	0.333	mg/kg wet	3.333		64	40-140			
Acetophenone	2.21	0.667	mg/kg wet	3.333		66	40-140			
Aniline	1.85	0.667	mg/kg wet	3.333		55	40-140			
Anthracene	2.80	0.333	mg/kg wet	3.333		84	40-140			
Azobenzene	2.55	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)anthracene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)pyrene	2.75	0.167	mg/kg wet	3.333		83	40-140			
Benzo(b)fluoranthene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(g,h,i)perylene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Benzo(k)fluoranthene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Benzoic Acid	2.21	1.67	mg/kg wet	3.333		66	40-140			
Benzyl Alcohol	2.06	0.333	mg/kg wet	3.333		62	40-140			
bis(2-Chloroethoxy)methane	2.12	0.333	mg/kg wet	3.333		64	40-140			
bis(2-Chloroethyl)ether	2.26	0.333	mg/kg wet	3.333		68	40-140			
bis(2-chloroisopropyl)Ether	2.14	0.333	mg/kg wet	3.333		64	40-140			
bis(2-Ethylhexyl)phthalate	3.13	0.333	mg/kg wet	3.333		94	40-140			
Butylbenzylphthalate	2.98	0.333	mg/kg wet	3.333		89	40-140			
Carbazole	3.02	0.333	mg/kg wet	3.333		90	40-140			
Chrysene	2.82	0.167	mg/kg wet	3.333		85	40-140			
Dibenzo(a,h)Anthracene	2.71	0.167	mg/kg wet	3.333		81	40-140			
Dibenzofuran	2.34	0.333	mg/kg wet	3.333		70	40-140			
Diethylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140			
Dimethylphthalate	2.76	0.333	mg/kg wet	3.333		83	40-140			
Di-n-butylphthalate	3.17	0.333	mg/kg wet	3.333		95	40-140			
Di-n-octylphthalate	3.41	0.333	mg/kg wet	3.333		102	40-140			
Fluoranthene	3.10	0.333	mg/kg wet	3.333		93	40-140			
Fluorene	2.66	0.333	mg/kg wet	3.333		80	40-140			
Hexachlorobenzene	2.54	0.167	mg/kg wet	3.333		76	40-140			
Hexachlorobutadiene	2.01	0.333	mg/kg wet	3.333		60	40-140			
Hexachlorocyclopentadiene	1.31	1.67	mg/kg wet	3.333		39	40-140			B-
Hexachloroethane	2.14	0.333	mg/kg wet	3.333		64	40-140			
Indeno(1,2,3-cd)Pyrene	2.65	0.333	mg/kg wet	3.333		80	40-140			
Isophorone	1.89	0.333	mg/kg wet	3.333		57	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91213 - 3546										
Naphthalene	2.15	0.333	mg/kg wet	3.333		64	40-140			
Nitrobenzene	2.08	0.333	mg/kg wet	3.333		63	40-140			
N-Nitrosodimethylamine	1.92	0.333	mg/kg wet	3.333		58	40-140			
N-Nitroso-Di-n-Propylamine	2.30	0.333	mg/kg wet	3.333		69	40-140			
N-nitrosodiphenylamine	2.59	0.333	mg/kg wet	3.333		78	40-140			
Pentachlorophenol	2.54	1.67	mg/kg wet	3.333		76	30-130			
Phenanthrene	2.73	0.333	mg/kg wet	3.333		82	40-140			
Phenol	2.61	0.333	mg/kg wet	3.333		78	30-130			
Pyrene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Pyridine	1.91	1.67	mg/kg wet	3.333		57	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.35*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.37*		mg/kg wet	*5.000*		*87*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.96*		mg/kg wet	*5.000*		*79*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.26*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2-Fluorophenol	*3.90*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.32*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: Phenol-d6	*4.04*		mg/kg wet	*5.000*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.98*		mg/kg wet	*3.333*		*89*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.21	0.333	mg/kg wet	3.333		66	40-140	9	30	
1,2,4-Trichlorobenzene	2.24	0.333	mg/kg wet	3.333		67	40-140	4	30	
1,2-Dichlorobenzene	2.30	0.333	mg/kg wet	3.333		69	40-140	2	30	
1,3-Dichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140	1	30	
1,4-Dichlorobenzene	2.23	0.333	mg/kg wet	3.333		67	40-140	0.8	30	
2,3,4,6-Tetrachlorophenol	2.71	1.67	mg/kg wet	3.333		81	30-130	12	30	
2,4,5-Trichlorophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	12	30	
2,4,6-Trichlorophenol	2.46	0.333	mg/kg wet	3.333		74	30-130	10	30	
2,4-Dichlorophenol	2.52	0.333	mg/kg wet	3.333		76	30-130	7	30	
2,4-Dimethylphenol	2.41	0.333	mg/kg wet	3.333		72	30-130	6	30	
2,4-Dinitrophenol	2.51	1.67	mg/kg wet	3.333		75	30-130	13	30	
2,4-Dinitrotoluene	3.37	0.333	mg/kg wet	3.333		101	40-140	11	30	
2,6-Dinitrotoluene	2.90	0.333	mg/kg wet	3.333		87	40-140	11	30	
2-Chloronaphthalene	2.26	0.333	mg/kg wet	3.333		68	40-140	9	30	
2-Chlorophenol	2.43	0.333	mg/kg wet	3.333		73	30-130	4	30	
2-Methylnaphthalene	2.30	0.333	mg/kg wet	3.333		69	40-140	6	30	
2-Methylphenol	2.47	0.333	mg/kg wet	3.333		74	30-130	5	30	
2-Nitroaniline	2.61	0.333	mg/kg wet	3.333		78	40-140	12	30	
2-Nitrophenol	2.19	0.333	mg/kg wet	3.333		66	30-130	5	30	
3,3´-Dichlorobenzidine	2.62	0.667	mg/kg wet	3.333		79	40-140	7	30	
3+4-Methylphenol	5.13	0.667	mg/kg wet	6.667		77	30-130	6	30	
3-Nitroaniline	3.17	0.333	mg/kg wet	3.333		95	40-140	12	30	
4,6-Dinitro-2-Methylphenol	2.99	1.67	mg/kg wet	3.333		90	30-130	7	30	
4-Bromophenyl-phenylether	2.70	0.333	mg/kg wet	3.333		81	40-140	6	30	
4-Chloro-3-Methylphenol	2.98	0.333	mg/kg wet	3.333		89	30-130	10	30	
4-Chloroaniline	1.81	0.667	mg/kg wet	3.333		54	40-140	13	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91213 - 3546										
4-Chloro-phenyl-phenyl ether	2.86	0.333	mg/kg wet	3.333		86	40-140	11	30	
4-Nitroaniline	3.00	0.333	mg/kg wet	3.333		90	40-140	7	30	
4-Nitrophenol	3.18	1.67	mg/kg wet	3.333		95	30-130	10	30	
Acenaphthene	2.48	0.333	mg/kg wet	3.333		74	40-140	11	30	
Acenaphthylene	2.36	0.333	mg/kg wet	3.333		71	40-140	10	30	
Acetophenone	2.31	0.667	mg/kg wet	3.333		69	40-140	4	30	
Aniline	1.97	0.667	mg/kg wet	3.333		59	40-140	6	30	
Anthracene	2.96	0.333	mg/kg wet	3.333		89	40-140	6	30	
Azobenzene	2.71	0.333	mg/kg wet	3.333		81	40-140	6	30	
Benzo(a)anthracene	3.13	0.333	mg/kg wet	3.333		94	40-140	8	30	
Benzo(a)pyrene	2.98	0.167	mg/kg wet	3.333		89	40-140	8	30	
Benzo(b)fluoranthene	3.28	0.333	mg/kg wet	3.333		98	40-140	9	30	
Benzo(g,h,i)perylene	2.75	0.333	mg/kg wet	3.333		82	40-140	6	30	
Benzo(k)fluoranthene	3.10	0.333	mg/kg wet	3.333		93	40-140	7	30	
Benzoic Acid	2.47	1.67	mg/kg wet	3.333		74	40-140	11	30	
Benzyl Alcohol	2.20	0.333	mg/kg wet	3.333		66	40-140	6	30	
bis(2-Chloroethoxy)methane	2.22	0.333	mg/kg wet	3.333		67	40-140	4	30	
bis(2-Chloroethyl)ether	2.33	0.333	mg/kg wet	3.333		70	40-140	3	30	
bis(2-chloroisopropyl)Ether	2.17	0.333	mg/kg wet	3.333		65	40-140	2	30	
bis(2-Ethylhexyl)phthalate	3.43	0.333	mg/kg wet	3.333		103	40-140	9	30	
Butylbenzylphthalate	3.30	0.333	mg/kg wet	3.333		99	40-140	10	30	
Carbazole	3.22	0.333	mg/kg wet	3.333		97	40-140	6	30	
Chrysene	3.06	0.167	mg/kg wet	3.333		92	40-140	8	30	
Dibenzo(a,h)Anthracene	2.86	0.167	mg/kg wet	3.333		86	40-140	6	30	
Dibenzofuran	2.62	0.333	mg/kg wet	3.333		79	40-140	12	30	
Diethylphthalate	3.28	0.333	mg/kg wet	3.333		98	40-140	8	30	
Dimethylphthalate	3.04	0.333	mg/kg wet	3.333		91	40-140	10	30	
Di-n-butylphthalate	3.35	0.333	mg/kg wet	3.333		101	40-140	5	30	
Di-n-octylphthalate	3.85	0.333	mg/kg wet	3.333		115	40-140	12	30	
Fluoranthene	3.32	0.333	mg/kg wet	3.333		100	40-140	7	30	
Fluorene	2.99	0.333	mg/kg wet	3.333		90	40-140	12	30	
Hexachlorobenzene	2.67	0.167	mg/kg wet	3.333		80	40-140	5	30	
Hexachlorobutadiene	2.09	0.333	mg/kg wet	3.333		63	40-140	4	30	
Hexachlorocyclopentadiene	1.40	1.67	mg/kg wet	3.333		42	40-140	7	30	
Hexachloroethane	2.17	0.333	mg/kg wet	3.333		65	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	2.82	0.333	mg/kg wet	3.333		85	40-140	6	30	
Isophorone	2.02	0.333	mg/kg wet	3.333		61	40-140	7	30	
Naphthalene	2.27	0.333	mg/kg wet	3.333		68	40-140	5	30	
Nitrobenzene	2.18	0.333	mg/kg wet	3.333		65	40-140	5	30	
N-Nitrosodimethylamine	1.95	0.333	mg/kg wet	3.333		59	40-140	2	30	
N-Nitroso-Di-n-Propylamine	2.39	0.333	mg/kg wet	3.333		72	40-140	4	30	
N-nitrosodiphenylamine	2.75	0.333	mg/kg wet	3.333		83	40-140	6	30	
Pentachlorophenol	2.66	1.67	mg/kg wet	3.333		80	30-130	5	30	
Phenanthrene	2.92	0.333	mg/kg wet	3.333		88	40-140	7	30	
Phenol	2.78	0.333	mg/kg wet	3.333		83	30-130	6	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91213 - 3546										
Pyrene	2.92	0.333	mg/kg wet	3.333		88	40-140	7	30	
Pyridine	1.89	1.67	mg/kg wet	3.333		57	40-140	0.9	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.35*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.44*		mg/kg wet	*5.000*		*89*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.96*		mg/kg wet	*5.000*		*79*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.42*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: 2-Fluorophenol	*3.88*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.40*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: Phenol-d6	*4.10*		mg/kg wet	*5.000*		*82*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.17*		mg/kg wet	*3.333*		*95*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
ESS Laboratory Work Order: 19I0291

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19I0291

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19I0291
Date Received: 9/11/2019
Project Due Date: 9/18/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 9/11/19 Time: 1343 By: [illegible]

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	386764	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	386767	Yes	NA	Yes	VOA Vial - Other	Other	
01	386768	Yes	NA	Yes	VOA Vial - Other	Other	
01	386770	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	386763	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	386765	Yes	NA	Yes	VOA Vial - Other	Other	
02	386766	Yes	NA	Yes	VOA Vial - Other	Other	
02	386769	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review

Were all containers scanned into storage/lab? Initials [illegible]
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [illegible] Date & Time: 9/11/19 12:00
Reviewed By: [illegible] Date & Time: 9/11/19 1343

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

ESS Project ID: 19I0291

Date Received: 9/11/2019

Delivered By: 9/11/19 1343

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1910291

Turn Time: Std Rush:

Regulatory State: RI

Is this project for any of the following?: ☐ MA-MCP ☐ CT-RCP ☐ RGP ☐ Remediation

Reporting Limits: RIDEM RSDEC / ICDEC

Electonic Deliverables: ☒ Limit Checker ☒ Excel ☐ Other (Please Specifiy) →

Company Name	Project #	Project Name
Beta Group	6912	NBC III A-4 and III A-5

Contact Person	Address
Joe McLoughlin	201 George Washington Hwy

City	State	Zip Code	PO #
Lincoln	RI	02865	

Telephone Number	FAX Number	Email Address
401.333.2382		jmcloughlin@beta-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PP-13 Metals *
1	9/10/19	9:15	Grab	Soil	B-8 4-6'	X	X	X	X	X
2	9/10/19	9:45	↓	↓	B-8 6-10'	X	X	X	X	X

Container Type:	AG-Amber Glass	B-BOD Bottle	G-Glass	P-Poly	S-Sterile	V-Vial	O-Other					
								~~ag~~	ag	ag	ag	ag

Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*					
												1%	1	1	1	1

Number of Containers:	3	1	—	—	1

Laboratory Use Only

Cooler Present: ✓

Seals Intact: —

Cooler Temperature: 4.6 °C ice hdm

Sampled by: [signature]

Comments: Please specify "Other" preservative and containers types in this space

*20x Rule metals (hdm 9/16/19)

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
[signature] 9/11/19 11:31	[signature] 9/11/19 1132		
Relinquished by: (Signature, Date & Time)	**Received By: (Signature, Date & Time)**	**Relinquished By: (Signature, Date & Time)**	**Received By: (Signature, Date & Time)**

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1910291

Turn Time: Std Rush:

Regulatory State: RI

Reporting Limits: RIDEM RSDEC / ICDEC

Is this project for any of the following?: ☐ MA-MCP ☐ CT-RCP ☐ RGP ☐ Remediation

Electonic Deliverables: ☒ Limit Checker ☒ Excel ☐ Other (Please Specifiy) →

Company Name	Project #	Project Name
Beta Group	6912	NBC III A-4 and III A-5

Contact Person	Address
Joe McLoughlin	201 George Washington Hwy

City	State	Zip Code	PO #
Lincoln	RI	02865	

Telephone Number	FAX Number	Email Address
401.333.2382		jmcloughlin@beta-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PP-13 Metals
1	9/10/19	9:15	Grab	Soil	B-8 4-6'	X	X	X	X	X
2	9/10/19	9:45	↓	↓	B-8 6-10'	X	X	X	X	X

Container Type:	AG-Amber Glass	B-BOD Bottle	G-Glass	P-Poly	S-Sterile	V-Vial	O-Other					
								~~ag~~	ag	ag	ag	ag

Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*					
												1%	1	1	1	1

Number of Containers:	3	1	—	—	1

Laboratory Use Only

Cooler Present: ✓

Seals Intact: —

Cooler Temperature: 4.6 °C ice hdm

Sampled by: [signature]

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
[signature] 9/11/19 11:31	[signature] 9/11/19 1132		
Relinquished by: (Signature, Date & Time)	**Received By: (Signature, Date & Time)**	**Relinquished By: (Signature, Date & Time)**	**Received By: (Signature, Date & Time)**

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (N/A)
ESS Laboratory Work Order Number: 19H0999

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:37 pm, Nov 07, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

SAMPLE RECEIPT

The following samples were received on August 30, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 8/30/19 at 14:52.

Revision 1 November 7, 2019: This report has been revised to include corrected TPH results for 19H0999-02.

Lab Number	Sample Name	Matrix	Analysis
19H0999-01	B-7 0-2ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
19H0999-02	B-7 2-4ft	Soil	6010C, 7471B, 8082A, 8100M, 8260B, 8260B Low, 8270D
19H0999-03	B-7 4-6ft	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B, 8260B Low, 8270D
19H0999-04	B-7 6-10ft	Soil	1311, 1311/6010C, 6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

19H0999-02 **Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**
1,4-Dichlorobenzene-D4 (9% @ 50-200%), Chlorobenzene-d5 (31% @ 50-200%)

19H0999-02 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (48% @ 70-130%), Toluene-d8 (162% @ 70-130%)

19H0999-03 **Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**
1,4-Dichlorobenzene-D4 (6% @ 50-200%), Chlorobenzene-d5 (20% @ 50-200%), Pentafluorobenzene (43% @ 50-200%)

19H0999-03 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
1,2-Dichloroethane-d4 (156% @ 70-130%), 4-Bromofluorobenzene (45% @ 70-130%), Dibromofluoromethane (165% @ 70-130%), Toluene-d8 (175% @ 70-130%)

C9H0632-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Chloromethane (32% @ 30%)

CH93024-BS1 **Blank Spike recovery is below lower control limit (B-).**
Chloromethane (68% @ 70-130%), Dichlorodifluoromethane (68% @ 70-130%)

5035/8260B Volatile Organic Compounds / Methanol

CI90432-BSD1 **Blank Spike recovery is below lower control limit (B-).**
1,2-Dibromo-3-Chloropropane (66% @ 70-130%), 1,4-Dioxane - Screen (0% @ 44-241%)

8100M Total Petroleum Hydrocarbons

19H0999-01 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

19H0999-02 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

19H0999-03 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

8270D Semi-Volatile Organic Compounds

C9H0626-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (106% @ 80-120%), 4,6-Dinitro-2-Methylphenol (104% @ 80-120%), Benzoic Acid (102% @ 80-120%)

C9H0626-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2-Methylnaphthalene (23% @ 20%)

C9H0626-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Aniline (23% @ 20%), Hexachlorocyclopentadiene (27% @ 20%), Isophorone (21% @ 20%)

C9I0053-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (104% @ 80-120%), 4,6-Dinitro-2-Methylphenol (84% @ 80-120%), Benzoic Acid (108% @ 80-120%), Pentachlorophenol (109% @ 80-120%)

C9I0053-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III ESS Laboratory Work Order: 19H0999

2-Nitroaniline (34% @ 20%), 4-Nitrophenol (22% @ 20%), Azobenzene (35% @ 20%), Hexachlorocyclopentadiene (25% @ 20%), Nitrobenzene (25% @ 20%), N-Nitrosodimethylamine (36% @ 20%), Pyridine (29% @ 20%)

C9I0053-TUN1 **Pentachlorophenol tailing factor > 2.**

CH93011-BS1 **Blank Spike recovery is below lower control limit (B-).**
Aniline (39% @ 40-140%), Hexachlorocyclopentadiene (38% @ 40-140%)

CH93011-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Aniline (39% @ 40-140%), Hexachlorocyclopentadiene (38% @ 40-140%), N-Nitrosodimethylamine (38% @ 40-140%), Pyridine (39% @ 40-140%)

Total Metals

19H0999-04 **Elevated Method Reporting Limits due to sample matrix (EL).**
Cadmium , Silver

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (3.29)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Arsenic	**3.82** (1.65)		6010C		1	KJK	09/06/19 13:12	3.46	100	CI90551
Beryllium	**0.37** (0.07)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Cadmium	ND (0.33)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Chromium	**4.95** (0.66)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Copper	**7.56** (1.65)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Lead	**6.43** (3.29)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Mercury	ND (0.027)		7471B		1	MKS	09/06/19 9:30	0.83	40	CI90552
Nickel	**6.77** (1.65)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Selenium	ND (3.29)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Silver	ND (0.33)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551
Thallium	ND (0.33)		6020A		1	NAR	09/06/19 14:18	3.46	100	CI90551
Zinc	**25.2** (1.65)		6010C		1	KJK	09/06/19 4:37	3.46	100	CI90551

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1,4-Dioxane	ND (0.0791)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
1-Chlorohexane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
2-Butanone	ND (0.0395)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
2-Chlorotoluene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
2-Hexanone	ND (0.0395)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
4-Chlorotoluene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
4-Methyl-2-Pentanone	ND (0.0395)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Acetone	ND (0.0395)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Benzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Bromobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Bromodichloromethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Bromoform	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Bromomethane	ND (0.0079)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Carbon Disulfide	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Chlorobenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Chloroethane	ND (0.0079)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Chloroform	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Chloromethane	ND (0.0079)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Dibromochloromethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Dibromomethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Diethyl Ether	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Di-isopropyl ether	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Ethylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Isopropylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Methylene Chloride	ND (0.0198)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Naphthalene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
n-Butylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
n-Propylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
sec-Butylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Styrene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
tert-Butylbenzene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Tetrachloroethene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Tetrahydrofuran	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Trichloroethene	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Vinyl Acetate	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Vinyl Chloride	ND (0.0079)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Xylene O	ND (0.0040)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Xylene P,M	ND (0.0079)		8260B Low		1	08/30/19 17:33	C9H0632	CH93024
Xylenes (Total)	ND (0.00791)		8260B Low		1	08/30/19 17:33		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*109 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*82 %*		*70-130*
Surrogate: Dibromofluoromethane	*107 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 19.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/3/19 16:30

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1221	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1232	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1242	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1248	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1254	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1260	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1262	ND (0.06)		8082A		1	09/04/19 17:37		CI90307
Aroclor 1268	ND (0.06)		8082A		1	09/04/19 17:37		CI90307

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*44 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*55 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*49 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*60 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 19.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/30/19 16:29

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**973** (858)		8100M		20	09/03/19 23:54	C9I0015	CH93012

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 14.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.459)		8270D		2	09/05/19 14:19	C9I0053	CH93011
1,2,4-Trichlorobenzene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
1,2-Dichlorobenzene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
1,3-Dichlorobenzene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
1,4-Dichlorobenzene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,3,4,6-Tetrachlorophenol	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,4,5-Trichlorophenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,4,6-Trichlorophenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,4-Dichlorophenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,4-Dimethylphenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,4-Dinitrophenol	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,4-Dinitrotoluene	ND (0.766)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2,6-Dinitrotoluene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2-Chloronaphthalene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2-Chlorophenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2-Methylnaphthalene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2-Methylphenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2-Nitroaniline	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
2-Nitrophenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
3,3´-Dichlorobenzidine	ND (0.766)		8270D		2	09/05/19 14:19	C9I0053	CH93011
3+4-Methylphenol	ND (3.06)		8270D		2	09/05/19 14:19	C9I0053	CH93011
3-Nitroaniline	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4,6-Dinitro-2-Methylphenol	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4-Bromophenyl-phenylether	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4-Chloro-3-Methylphenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4-Chloroaniline	ND (3.06)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4-Chloro-phenyl-phenyl ether	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4-Nitroaniline	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
4-Nitrophenol	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Acenaphthene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Acenaphthylene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Acetophenone	ND (3.06)		8270D		2	09/05/19 14:19	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 14.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (3.06)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Anthracene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Azobenzene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzo(a)anthracene	ND (0.766)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzo(a)pyrene	ND (0.305)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzo(b)fluoranthene	ND (0.766)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzo(g,h,i)perylene	ND (0.459)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzo(k)fluoranthene	ND (0.766)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzoic Acid	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Benzyl Alcohol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
bis(2-Chloroethoxy)methane	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
bis(2-Chloroethyl)ether	ND (0.459)		8270D		2	09/05/19 14:19	C9I0053	CH93011
bis(2-chloroisopropyl)Ether	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
bis(2-Ethylhexyl)phthalate	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Butylbenzylphthalate	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Carbazole	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Chrysene	ND (0.305)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Dibenzo(a,h)Anthracene	ND (0.305)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Dibenzofuran	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Diethylphthalate	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Dimethylphthalate	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Di-n-butylphthalate	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Di-n-octylphthalate	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Fluoranthene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Fluorene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Hexachlorobenzene	ND (0.305)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Hexachlorobutadiene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Hexachlorocyclopentadiene	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Hexachloroethane	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Indeno(1,2,3-cd)Pyrene	ND (0.766)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Isophorone	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Naphthalene	ND (0.382)		8270D		2	09/05/19 14:19	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 0-2ft
Date Sampled: 08/30/19 08:20
Percent Solids: 88
Initial Volume: 14.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
N-Nitrosodimethylamine	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
N-Nitroso-Di-n-Propylamine	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
N-nitrosodiphenylamine	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Pentachlorophenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Phenanthrene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Phenol	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Pyrene	ND (1.53)		8270D		2	09/05/19 14:19	C9I0053	CH93011
Pyridine	ND (7.66)		8270D		2	09/05/19 14:19	C9I0053	CH93011

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*59 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*105 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*81 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*83 %*		*30-130*
Surrogate: 2-Fluorophenol	*63 %*		*30-130*
Surrogate: Nitrobenzene-d5	*55 %*		*30-130*
Surrogate: Phenol-d6	*76 %*		*30-130*
Surrogate: p-Terphenyl-d14	*111 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.75)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Arsenic	**9.20** (2.37)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Beryllium	**0.30** (0.10)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Cadmium	ND (0.47)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Chromium	**9.32** (0.95)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Copper	**23.1** (2.37)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Lead	**28.9** (4.75)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Mercury	**0.157** (0.024)		7471B		1	MKS	09/06/19 9:38	0.98	40	CI90552
Nickel	**9.50** (2.37)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Selenium	ND (4.75)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Silver	ND (0.47)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Thallium	ND (4.75)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551
Zinc	**41.4** (2.37)		6010C		1	KJK	09/06/19 4:41	2.49	100	CI90551

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2,4-Trimethylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2-Dichlorobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,3,5-Trimethylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,3-Dichlorobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,4-Dichlorobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1,4-Dioxane	ND (0.0923)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
1-Chlorohexane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
2-Butanone	ND (0.0462)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
2-Chlorotoluene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
2-Hexanone	ND (0.0462)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
4-Chlorotoluene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
4-Methyl-2-Pentanone	ND (0.0462)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Acetone	**0.0472** (0.0462)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Benzene	**0.0062** (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Bromobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Bromodichloromethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Bromoform	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Bromomethane	ND (0.0092)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Carbon Disulfide	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Chlorobenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Chloroethane	ND (0.0092)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Chloroform	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Chloromethane	ND (0.0092)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Dibromochloromethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Dibromomethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Dichlorodifluoromethane	ND (0.0092)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Diethyl Ether	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Di-isopropyl ether	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Ethylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Isopropylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Methylene Chloride	ND (0.0231)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Naphthalene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
n-Butylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
n-Propylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
sec-Butylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Styrene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
tert-Butylbenzene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Tetrachloroethene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Tetrahydrofuran	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Trichloroethene	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Vinyl Acetate	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Vinyl Chloride	ND (0.0092)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Xylene O	ND (0.0046)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Xylene P,M	ND (0.0092)		8260B Low		1	08/30/19 15:51	C9H0632	CH93024
Xylenes (Total)	ND (0.00923)		8260B Low		1	08/30/19 15:51		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*128 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*48 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*130 %*		*70-130*
Surrogate: Toluene-d8	*162 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 19.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,1,1-Trichloroethane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,1,2,2-Tetrachloroethane	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,1,2-Trichloroethane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,1-Dichloroethane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,1-Dichloroethene	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,1-Dichloropropene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2,3-Trichlorobenzene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2,3-Trichloropropane	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2,4-Trichlorobenzene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2,4-Trimethylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2-Dibromo-3-Chloropropane	ND (1.08)	0.216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2-Dibromoethane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2-Dichlorobenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2-Dichloroethane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,2-Dichloropropane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,3,5-Trimethylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,3-Dichlorobenzene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,3-Dichloropropane	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,4-Dichlorobenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
1,4-Dioxane - Screen	ND (43.1)	40.9	8260B		1	09/04/19 12:24	C9I0045	CI90432
1-Chlorohexane	ND (0.216)	0.0862	8260B		1	09/04/19 12:24	C9I0045	CI90432
2,2-Dichloropropane	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
2-Butanone	ND (1.08)	0.733	8260B		1	09/04/19 12:24	C9I0045	CI90432
2-Chlorotoluene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
2-Hexanone	ND (1.08)	0.323	8260B		1	09/04/19 12:24	C9I0045	CI90432
4-Chlorotoluene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
4-Isopropyltoluene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
4-Methyl-2-Pentanone	ND (1.08)	0.345	8260B		1	09/04/19 12:24	C9I0045	CI90432
Acetone	ND (1.08)	0.582	8260B		1	09/04/19 12:24	C9I0045	CI90432
Benzene	**0.291** (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Bromobenzene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 19.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
Bromodichloromethane	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Bromoform	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Bromomethane	ND (0.216)	0.0862	8260B		1	09/04/19 12:24	C9I0045	CI90432
Carbon Disulfide	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Carbon Tetrachloride	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Chlorobenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Chloroethane	ND (0.216)	0.0862	8260B		1	09/04/19 12:24	C9I0045	CI90432
Chloroform	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Chloromethane	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
cis-1,2-Dichloroethene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
cis-1,3-Dichloropropene	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
Dibromochloromethane	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Dibromomethane	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
Dichlorodifluoromethane	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
Diethyl Ether	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
Di-isopropyl ether	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Ethyl tertiary-butyl ether	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Ethylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Hexachlorobutadiene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Isopropylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Methyl tert-Butyl Ether	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
Methylene Chloride	**J 0.0733** (0.431)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Naphthalene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
n-Butylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
n-Propylbenzene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
sec-Butylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Styrene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
tert-Butylbenzene	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Tertiary-amyl methyl ether	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Tetrachloroethene	**J 0.0560** (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Tetrahydrofuran	ND (1.08)	0.345	8260B		1	09/04/19 12:24	C9I0045	CI90432

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 19.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	**J 0.151** (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
trans-1,2-Dichloroethene	ND (0.216)	0.0647	8260B		1	09/04/19 12:24	C9I0045	CI90432
trans-1,3-Dichloropropene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Trichloroethene	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Trichlorofluoromethane	ND (0.216)	0.0862	8260B		1	09/04/19 12:24	C9I0045	CI90432
Vinyl Acetate	ND (0.216)	0.108	8260B		1	09/04/19 12:24	C9I0045	CI90432
Vinyl Chloride	ND (0.216)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Xylene O	ND (0.216)	0.0216	8260B		1	09/04/19 12:24	C9I0045	CI90432
Xylene P,M	**J 0.0539** (0.431)	0.0431	8260B		1	09/04/19 12:24	C9I0045	CI90432
Xylenes (Total)	ND (0.431)		8260B		1	09/04/19 12:24		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*115 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*111 %*		*70-130*
Surrogate: Dibromofluoromethane	*120 %*		*70-130*
Surrogate: Toluene-d8	*113 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 19.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/3/19 16:30

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1221	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1232	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1242	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1248	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1254	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1260	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1262	ND (0.06)		8082A		1	09/04/19 17:56		CI90307
Aroclor 1268	ND (0.06)		8082A		1	09/04/19 17:56		CI90307

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*37 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*45 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*37 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*46 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 19.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/30/19 16:29

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**735** (398)		8100M		20	09/04/19 0:27	C9I0015	CH93012

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 14.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.493)		8270D		2	09/05/19 14:47	C9I0053	CH93011
1,2,4-Trichlorobenzene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
1,2-Dichlorobenzene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
1,3-Dichlorobenzene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
1,4-Dichlorobenzene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,3,4,6-Tetrachlorophenol	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,4,5-Trichlorophenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,4,6-Trichlorophenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,4-Dichlorophenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,4-Dimethylphenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,4-Dinitrophenol	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,4-Dinitrotoluene	ND (0.823)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2,6-Dinitrotoluene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2-Chloronaphthalene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2-Chlorophenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2-Methylnaphthalene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2-Methylphenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2-Nitroaniline	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
2-Nitrophenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
3,3´-Dichlorobenzidine	ND (0.823)		8270D		2	09/05/19 14:47	C9I0053	CH93011
3+4-Methylphenol	ND (3.29)		8270D		2	09/05/19 14:47	C9I0053	CH93011
3-Nitroaniline	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4,6-Dinitro-2-Methylphenol	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4-Bromophenyl-phenylether	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4-Chloro-3-Methylphenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4-Chloroaniline	ND (3.29)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4-Chloro-phenyl-phenyl ether	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4-Nitroaniline	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
4-Nitrophenol	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Acenaphthene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Acenaphthylene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Acetophenone	ND (3.29)		8270D		2	09/05/19 14:47	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 14.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (3.29)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Anthracene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Azobenzene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzo(a)anthracene	ND (0.823)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzo(a)pyrene	**0.399** (0.328)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzo(b)fluoranthene	ND (0.823)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzo(g,h,i)perylene	ND (0.493)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzo(k)fluoranthene	ND (0.823)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzoic Acid	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Benzyl Alcohol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
bis(2-Chloroethoxy)methane	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
bis(2-Chloroethyl)ether	ND (0.493)		8270D		2	09/05/19 14:47	C9I0053	CH93011
bis(2-chloroisopropyl)Ether	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
bis(2-Ethylhexyl)phthalate	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Butylbenzylphthalate	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Carbazole	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Chrysene	**0.413** (0.328)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Dibenzo(a,h)Anthracene	ND (0.328)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Dibenzofuran	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Diethylphthalate	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Dimethylphthalate	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Di-n-butylphthalate	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Di-n-octylphthalate	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Fluoranthene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Fluorene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Hexachlorobenzene	ND (0.328)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Hexachlorobutadiene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Hexachlorocyclopentadiene	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Hexachloroethane	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Indeno(1,2,3-cd)Pyrene	ND (0.823)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Isophorone	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Naphthalene	ND (0.410)		8270D		2	09/05/19 14:47	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 2-4ft
Date Sampled: 08/30/19 08:35
Percent Solids: 85
Initial Volume: 14.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
N-Nitrosodimethylamine	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
N-Nitroso-Di-n-Propylamine	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
N-nitrosodiphenylamine	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Pentachlorophenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Phenanthrene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Phenol	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Pyrene	ND (1.64)		8270D		2	09/05/19 14:47	C9I0053	CH93011
Pyridine	ND (8.23)		8270D		2	09/05/19 14:47	C9I0053	CH93011

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*57 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*106 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*72 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*82 %*		*30-130*
Surrogate: 2-Fluorophenol	*60 %*		*30-130*
Surrogate: Nitrobenzene-d5	*43 %*		*30-130*
Surrogate: Phenol-d6	*68 %*		*30-130*
Surrogate: p-Terphenyl-d14	*116 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (2.39)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Arsenic	**8.15** (1.19)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Beryllium	**0.41** (0.05)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Cadmium	ND (0.24)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Chromium	**9.59** (0.48)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Copper	**20.7** (1.19)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Lead	**21.8** (2.39)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Mercury	**0.092** (0.011)		7471B		1	MKS	09/06/19 9:40	2.19	40	CI90552
Nickel	**9.89** (1.19)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Selenium	ND (2.39)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551
Silver	ND (0.48)		6010C		2	KJK	09/06/19 13:16	5.17	100	CI90551
Thallium	ND (0.24)		6020A		1	NAR	09/06/19 14:23	5.17	100	CI90551
Zinc	**37.1** (1.19)		6010C		1	KJK	09/06/19 4:56	5.17	100	CI90551

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 5.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,1,1-Trichloroethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,1,2,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,1,2-Trichloroethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,1-Dichloroethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,1-Dichloroethene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,1-Dichloropropene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2,3-Trichlorobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2,3-Trichloropropane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2,4-Trichlorobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2,4-Trimethylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2-Dibromo-3-Chloropropane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2-Dibromoethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2-Dichlorobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2-Dichloroethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,2-Dichloropropane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,3,5-Trimethylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,3-Dichlorobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,3-Dichloropropane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,4-Dichlorobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1,4-Dioxane	ND (0.116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
1-Chlorohexane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
2,2-Dichloropropane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
2-Butanone	ND (0.0582)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
2-Chlorotoluene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
2-Hexanone	ND (0.0582)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
4-Chlorotoluene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
4-Isopropyltoluene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
4-Methyl-2-Pentanone	ND (0.0582)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Acetone	ND (0.0582)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Benzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Bromobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 5.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Bromodichloromethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Bromoform	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Bromomethane	ND (0.0116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Carbon Disulfide	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Carbon Tetrachloride	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Chlorobenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Chloroethane	ND (0.0116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Chloroform	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Chloromethane	ND (0.0116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
cis-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
cis-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Dibromochloromethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Dibromomethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Dichlorodifluoromethane	ND (0.0116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Diethyl Ether	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Di-isopropyl ether	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Ethyl tertiary-butyl ether	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Ethylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Hexachlorobutadiene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Isopropylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Methyl tert-Butyl Ether	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Methylene Chloride	ND (0.0291)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Naphthalene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
n-Butylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
n-Propylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
sec-Butylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Styrene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
tert-Butylbenzene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Tertiary-amyl methyl ether	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Tetrachloroethene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Tetrahydrofuran	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 5.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
trans-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
trans-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Trichloroethene	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Trichlorofluoromethane	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Vinyl Acetate	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Vinyl Chloride	ND (0.0116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Xylene O	ND (0.0058)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Xylene P,M	ND (0.0116)		8260B Low		1	08/30/19 16:16	C9H0632	CH93024
Xylenes (Total)	ND (0.0116)		8260B Low		1	08/30/19 16:16		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*156 %*	*SC*	*70-130*
Surrogate: 4-Bromofluorobenzene	*45 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*165 %*	*SC*	*70-130*
Surrogate: Toluene-d8	*175 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 16.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,1,1-Trichloroethane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,1,2,2-Tetrachloroethane	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,1,2-Trichloroethane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,1-Dichloroethane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,1-Dichloroethene	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,1-Dichloropropene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2,3-Trichlorobenzene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2,3-Trichloropropane	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2,4-Trichlorobenzene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2,4-Trimethylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2-Dibromo-3-Chloropropane	ND (1.36)	0.271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2-Dibromoethane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2-Dichlorobenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2-Dichloroethane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,2-Dichloropropane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,3,5-Trimethylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,3-Dichlorobenzene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,3-Dichloropropane	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,4-Dichlorobenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
1,4-Dioxane - Screen	ND (54.3)	51.5	8260B		1	09/04/19 12:51	C9I0045	CI90432
1-Chlorohexane	ND (0.271)	0.109	8260B		1	09/04/19 12:51	C9I0045	CI90432
2,2-Dichloropropane	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
2-Butanone	ND (1.36)	0.922	8260B		1	09/04/19 12:51	C9I0045	CI90432
2-Chlorotoluene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
2-Hexanone	ND (1.36)	0.407	8260B		1	09/04/19 12:51	C9I0045	CI90432
4-Chlorotoluene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
4-Isopropyltoluene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
4-Methyl-2-Pentanone	ND (1.36)	0.434	8260B		1	09/04/19 12:51	C9I0045	CI90432
Acetone	ND (1.36)	0.732	8260B		1	09/04/19 12:51	C9I0045	CI90432
Benzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Bromobenzene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 16.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
Bromodichloromethane	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Bromoform	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Bromomethane	ND (0.271)	0.109	8260B		1	09/04/19 12:51	C9I0045	CI90432
Carbon Disulfide	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Carbon Tetrachloride	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Chlorobenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Chloroethane	ND (0.271)	0.109	8260B		1	09/04/19 12:51	C9I0045	CI90432
Chloroform	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Chloromethane	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
cis-1,2-Dichloroethene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
cis-1,3-Dichloropropene	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
Dibromochloromethane	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Dibromomethane	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
Dichlorodifluoromethane	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
Diethyl Ether	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
Di-isopropyl ether	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Ethyl tertiary-butyl ether	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Ethylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Hexachlorobutadiene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Isopropylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Methyl tert-Butyl Ether	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
Methylene Chloride	**J 0.0732** (0.543)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Naphthalene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
n-Butylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
n-Propylbenzene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
sec-Butylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Styrene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
tert-Butylbenzene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Tertiary-amyl methyl ether	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Tetrachloroethene	**J 0.0787** (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Tetrahydrofuran	ND (1.36)	0.434	8260B		1	09/04/19 12:51	C9I0045	CI90432

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 16.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
trans-1,2-Dichloroethene	ND (0.271)	0.0814	8260B		1	09/04/19 12:51	C9I0045	CI90432
trans-1,3-Dichloropropene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Trichloroethene	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Trichlorofluoromethane	ND (0.271)	0.109	8260B		1	09/04/19 12:51	C9I0045	CI90432
Vinyl Acetate	ND (0.271)	0.136	8260B		1	09/04/19 12:51	C9I0045	CI90432
Vinyl Chloride	ND (0.271)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Xylene O	ND (0.271)	0.0271	8260B		1	09/04/19 12:51	C9I0045	CI90432
Xylene P,M	ND (0.543)	0.0543	8260B		1	09/04/19 12:51	C9I0045	CI90432
Xylenes (Total)	ND (0.543)		8260B		1	09/04/19 12:51		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*99 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*100 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*99 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 19.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/3/19 16:30

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1221	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1232	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1242	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1248	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1254	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1260	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1262	ND (0.06)		8082A		1	09/04/19 18:15		CI90307
Aroclor 1268	ND (0.06)		8082A		1	09/04/19 18:15		CI90307

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*37 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*47 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*41 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*50 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 19.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/30/19 16:29

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**1220** (954)		8100M		20	09/04/19 0:59	C9I0015	CH93012

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 14.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.500)		8270D		2	09/05/19 15:16	C9I0053	CH93011
1,2,4-Trichlorobenzene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
1,2-Dichlorobenzene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
1,3-Dichlorobenzene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
1,4-Dichlorobenzene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,3,4,6-Tetrachlorophenol	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,4,5-Trichlorophenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,4,6-Trichlorophenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,4-Dichlorophenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,4-Dimethylphenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,4-Dinitrophenol	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,4-Dinitrotoluene	ND (0.836)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2,6-Dinitrotoluene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2-Chloronaphthalene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2-Chlorophenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2-Methylnaphthalene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2-Methylphenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2-Nitroaniline	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
2-Nitrophenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
3,3´-Dichlorobenzidine	ND (0.836)		8270D		2	09/05/19 15:16	C9I0053	CH93011
3+4-Methylphenol	ND (3.34)		8270D		2	09/05/19 15:16	C9I0053	CH93011
3-Nitroaniline	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4,6-Dinitro-2-Methylphenol	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4-Bromophenyl-phenylether	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4-Chloro-3-Methylphenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4-Chloroaniline	ND (3.34)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4-Chloro-phenyl-phenyl ether	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4-Nitroaniline	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
4-Nitrophenol	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Acenaphthene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Acenaphthylene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Acetophenone	ND (3.34)		8270D		2	09/05/19 15:16	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 14.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (3.34)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Anthracene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Azobenzene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzo(a)anthracene	ND (0.836)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzo(a)pyrene	**0.394** (0.333)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzo(b)fluoranthene	ND (0.836)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzo(g,h,i)perylene	ND (0.500)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzo(k)fluoranthene	ND (0.836)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzoic Acid	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Benzyl Alcohol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
bis(2-Chloroethoxy)methane	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
bis(2-Chloroethyl)ether	ND (0.500)		8270D		2	09/05/19 15:16	C9I0053	CH93011
bis(2-chloroisopropyl)Ether	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
bis(2-Ethylhexyl)phthalate	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Butylbenzylphthalate	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Carbazole	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Chrysene	**0.485** (0.333)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Dibenzo(a,h)Anthracene	ND (0.333)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Dibenzofuran	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Diethylphthalate	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Dimethylphthalate	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Di-n-butylphthalate	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Di-n-octylphthalate	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Fluoranthene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Fluorene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Hexachlorobenzene	ND (0.333)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Hexachlorobutadiene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Hexachlorocyclopentadiene	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Hexachloroethane	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Indeno(1,2,3-cd)Pyrene	ND (0.836)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Isophorone	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Naphthalene	ND (0.417)		8270D		2	09/05/19 15:16	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 4-6ft
Date Sampled: 08/30/19 08:50
Percent Solids: 81
Initial Volume: 14.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
N-Nitrosodimethylamine	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
N-Nitroso-Di-n-Propylamine	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
N-nitrosodiphenylamine	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Pentachlorophenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Phenanthrene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Phenol	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Pyrene	ND (1.67)		8270D		2	09/05/19 15:16	C9I0053	CH93011
Pyridine	ND (8.36)		8270D		2	09/05/19 15:16	C9I0053	CH93011

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*58 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*102 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*74 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*79 %*		*30-130*
Surrogate: 2-Fluorophenol	*59 %*		*30-130*
Surrogate: Nitrobenzene-d5	*46 %*		*30-130*
Surrogate: Phenol-d6	*69 %*		*30-130*
Surrogate: p-Terphenyl-d14	*121 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	**5.24** (0.25)		6020A		1	NAR	09/06/19 14:28	5.16	100	CI90551
Arsenic	**52.5** (1.23)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551
Beryllium	ND (0.05)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551
Cadmium	**EL** ND (2.46)		6010C		10	KJK	09/06/19 13:20	5.16	100	CI90551
Chromium	**17.2** (0.49)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551
Copper	**327** (1.23)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551
Lead	**153** (2.46)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551
Mercury	**0.177** (0.011)		7471B		1	MKS	09/06/19 9:42	2.25	40	CI90552
Nickel	**105** (1.23)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551
Selenium	**0.72** (0.25)		6020A		1	NAR	09/06/19 14:28	5.16	100	CI90551
Silver	**EL** ND (2.46)		6010C		10	KJK	09/06/19 13:20	5.16	100	CI90551
Thallium	ND (0.25)		6020A		1	NAR	09/06/19 14:28	5.16	100	CI90551
Zinc	**106** (1.23)		6010C		1	KJK	09/06/19 5:00	5.16	100	CI90551

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Lead	**0.054** (0.050)		1311/6010C		1	NAR	09/09/19 14:57	50	50	CI90902

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 7.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1,4-Dioxane	ND (0.0814)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
1-Chlorohexane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
2-Butanone	ND (0.0407)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
2-Chlorotoluene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
2-Hexanone	ND (0.0407)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
4-Chlorotoluene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
4-Methyl-2-Pentanone	ND (0.0407)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Acetone	ND (0.0407)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Benzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Bromobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 7.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Bromodichloromethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Bromoform	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Bromomethane	ND (0.0081)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Carbon Disulfide	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Chlorobenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Chloroethane	ND (0.0081)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Chloroform	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Chloromethane	ND (0.0081)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Dibromochloromethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Dibromomethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Diethyl Ether	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Di-isopropyl ether	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Ethylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Isopropylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Methylene Chloride	ND (0.0204)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Naphthalene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
n-Butylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
n-Propylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
sec-Butylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Styrene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
tert-Butylbenzene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Tetrachloroethene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Tetrahydrofuran	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 7.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Trichloroethene	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Vinyl Acetate	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Vinyl Chloride	ND (0.0081)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Xylene O	ND (0.0041)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Xylene P,M	ND (0.0081)		8260B Low		1	08/30/19 16:42	C9H0632	CH93024
Xylenes (Total)	ND (0.00814)		8260B Low		1	08/30/19 16:42		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*111 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*88 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 20.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/3/19 16:30

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1221	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1232	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1242	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1248	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1254	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1260	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1262	ND (0.06)		8082A		1	09/04/19 18:34		CI90307
Aroclor 1268	ND (0.06)		8082A		1	09/04/19 18:34		CI90307

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*62 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*60 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*82 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 19.6
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 8/30/19 16:29

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**143** (48.6)		8100M		1	09/03/19 21:45	C9I0015	CH93012

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*99 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.125)		8270D		1	09/05/19 15:44	C9I0053	CH93011
1,2,4-Trichlorobenzene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
1,2-Dichlorobenzene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
1,3-Dichlorobenzene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
1,4-Dichlorobenzene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,3,4,6-Tetrachlorophenol	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,4,5-Trichlorophenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,4,6-Trichlorophenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,4-Dichlorophenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,4-Dimethylphenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,4-Dinitrophenol	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,4-Dinitrotoluene	ND (0.208)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2,6-Dinitrotoluene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2-Chloronaphthalene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2-Chlorophenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2-Methylnaphthalene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2-Methylphenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2-Nitroaniline	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
2-Nitrophenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
3,3´-Dichlorobenzidine	ND (0.208)		8270D		1	09/05/19 15:44	C9I0053	CH93011
3+4-Methylphenol	ND (0.831)		8270D		1	09/05/19 15:44	C9I0053	CH93011
3-Nitroaniline	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4,6-Dinitro-2-Methylphenol	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4-Bromophenyl-phenylether	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4-Chloro-3-Methylphenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4-Chloroaniline	ND (0.831)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4-Chloro-phenyl-phenyl ether	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4-Nitroaniline	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
4-Nitrophenol	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Acenaphthene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Acenaphthylene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Acetophenone	ND (0.831)		8270D		1	09/05/19 15:44	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.831)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Anthracene	**0.523** (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Azobenzene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzo(a)anthracene	**1.83** (0.208)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzo(a)pyrene	**1.70** (0.083)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzo(b)fluoranthene	**1.49** (0.208)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzo(g,h,i)perylene	**0.847** (0.125)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzo(k)fluoranthene	**1.58** (0.208)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzoic Acid	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Benzyl Alcohol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
bis(2-Chloroethoxy)methane	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
bis(2-Chloroethyl)ether	ND (0.125)		8270D		1	09/05/19 15:44	C9I0053	CH93011
bis(2-chloroisopropyl)Ether	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
bis(2-Ethylhexyl)phthalate	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Butylbenzylphthalate	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Carbazole	**0.505** (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Chrysene	**1.95** (0.083)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Dibenzo(a,h)Anthracene	**0.305** (0.083)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Dibenzofuran	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Diethylphthalate	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Dimethylphthalate	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Di-n-butylphthalate	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Di-n-octylphthalate	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Fluoranthene	**4.49** (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Fluorene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Hexachlorobenzene	ND (0.083)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Hexachlorobutadiene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Hexachlorocyclopentadiene	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Hexachloroethane	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Indeno(1,2,3-cd)Pyrene	**0.811** (0.208)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Isophorone	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Naphthalene	**0.401** (0.104)		8270D		1	09/05/19 15:44	C9I0053	CH93011

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/30/19 16:29

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
N-Nitrosodimethylamine	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
N-Nitroso-Di-n-Propylamine	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
N-nitrosodiphenylamine	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Pentachlorophenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Phenanthrene	**3.47** (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Phenol	ND (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Pyrene	**3.73** (0.415)		8270D		1	09/05/19 15:44	C9I0053	CH93011
Pyridine	ND (2.08)		8270D		1	09/05/19 15:44	C9I0053	CH93011

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*73 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*87 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*79 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*73 %*		*30-130*
Surrogate: 2-Fluorophenol	*73 %*		*30-130*
Surrogate: Nitrobenzene-d5	*56 %*		*30-130*
Surrogate: Phenol-d6	*73 %*		*30-130*
Surrogate: p-Terphenyl-d14	*96 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: B-7 6-10ft
Date Sampled: 08/30/19 09:10
Percent Solids: 79
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 19H0999
ESS Laboratory Sample ID: 19H0999-04
Sample Matrix: Soil
Units: °C
Analyst: KJK
Prepared: 9/6/19 20:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**20.4** (N/A)		1311		1	KJK	09/07/19 12:10	CI90635
Temperature (Max C)	**21.2** (N/A)		1311		1	KJK	09/07/19 12:10	CI90635
Temperature (Range)	**Temperature is not within 23 +/-2 ºC.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				Total Metals						
Batch CI90551 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Antimony	ND	0.50	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	47.0	17.5	mg/kg wet	42.40		111	80-120			
Arsenic	128	8.77	mg/kg wet	128.0		100	80-120			
Beryllium	220	0.39	mg/kg wet	217.0		101	80-120			
Cadmium	103	1.75	mg/kg wet	99.00		104	80-120			
Chromium	120	3.51	mg/kg wet	116.0		103	80-120			
Copper	91.1	8.77	mg/kg wet	89.60		102	80-120			
Lead	288	17.5	mg/kg wet	277.0		104	80-120			
Nickel	109	8.77	mg/kg wet	107.0		102	80-120			
Selenium	239	17.5	mg/kg wet	242.0		99	80-120			
Silver	65.8	1.75	mg/kg wet	64.30		102	80-120			
Thallium	189	17.5	mg/kg wet	183.0		103	80-120			
Zinc	566	8.77	mg/kg wet	561.0		101	80-120			
LCS										
Antimony	45.3	8.77	mg/kg wet	42.40		107	80-120			
Selenium	261	8.77	mg/kg wet	242.0		108	80-120			
Thallium	196	8.77	mg/kg wet	183.0		107	80-120			
LCS Dup										
Antimony	42.9	16.9	mg/kg wet	42.40		101	80-120	9	20	
Arsenic	123	8.47	mg/kg wet	128.0		96	80-120	4	20	
Beryllium	216	0.37	mg/kg wet	217.0		99	80-120	2	20	
Cadmium	97.8	1.69	mg/kg wet	99.00		99	80-120	5	20	
Chromium	117	3.39	mg/kg wet	116.0		100	80-120	3	20	
Copper	87.9	8.47	mg/kg wet	89.60		98	80-120	4	20	
Lead	275	16.9	mg/kg wet	277.0		99	80-120	4	20	
Nickel	110	8.47	mg/kg wet	107.0		103	80-120	0.8	20	
Selenium	229	16.9	mg/kg wet	242.0		95	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CI90551 - 3050B										
Silver	64.4	1.69	mg/kg wet	64.30		100	80-120	2	20	
Thallium	182	16.9	mg/kg wet	183.0		100	80-120	3	20	
Zinc	550	8.47	mg/kg wet	561.0		98	80-120	3	20	
LCS Dup										
Antimony	38.9	8.47	mg/kg wet	42.40		92	80-120	15	30	
Selenium	242	8.47	mg/kg wet	242.0		100	80-120	8	30	
Thallium	179	8.47	mg/kg wet	183.0		98	80-120	9	30	
Batch CI90552 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	23.5	3.36	mg/kg wet	27.30		86	80-120			
LCS Dup										
Mercury	22.2	3.54	mg/kg wet	27.30		81	80-120	6	20	
1311 TCLP Metals										
Batch CI90902 - 3005A_TCLP										
Blank										
Lead	ND	0.050	mg/L							
LCS										
Lead	0.451	0.050	mg/L	0.5000		90	80-120			
LCS Dup										
Lead	0.445	0.050	mg/L	0.5000		89	80-120	1	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0526*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0440*		mg/kg wet	*0.05000*		*88*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0527*		mg/kg wet	*0.05000*		*105*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,1-Trichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,1,2,2-Tetrachloroethane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
1,1,2-Trichloroethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,1-Dichloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,1-Dichloroethene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloropropene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
1,2,3-Trichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,3-Trichloropropane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
1,2,4-Trichlorobenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,4-Trimethylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dibromo-3-Chloropropane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
1,2-Dibromoethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloropropane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
1,3,5-Trimethylbenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
1,3-Dichloropropane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
1,4-Dioxane	0.719	0.100	mg/kg wet	1.000		72	70-130			
1-Chlorohexane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
2,2-Dichloropropane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
2-Butanone	0.214	0.0500	mg/kg wet	0.2500		85	70-130			
2-Chlorotoluene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
2-Hexanone	0.207	0.0500	mg/kg wet	0.2500		83	70-130			
4-Chlorotoluene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CH93024 - 5035										
4-Isopropyltoluene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
4-Methyl-2-Pentanone	0.215	0.0500	mg/kg wet	0.2500		86	70-130			
Acetone	0.181	0.0500	mg/kg wet	0.2500		72	70-130			
Benzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Bromobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Bromochloromethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Bromodichloromethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Bromoform	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Bromomethane	0.0633	0.0100	mg/kg wet	0.05000		127	70-130			
Carbon Disulfide	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Carbon Tetrachloride	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Chlorobenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Chloroethane	0.0391	0.0100	mg/kg wet	0.05000		78	70-130			
Chloroform	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Chloromethane	0.0338	0.0100	mg/kg wet	0.05000		68	70-130			B-
cis-1,2-Dichloroethene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
cis-1,3-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Dibromochloromethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Dibromomethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Dichlorodifluoromethane	0.0341	0.0100	mg/kg wet	0.05000		68	70-130			B-
Diethyl Ether	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Di-isopropyl ether	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
Ethyl tertiary-butyl ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Ethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Hexachlorobutadiene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Isopropylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Methyl tert-Butyl Ether	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
Methylene Chloride	0.0522	0.0250	mg/kg wet	0.05000		104	70-130			
Naphthalene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
n-Butylbenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
n-Propylbenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
sec-Butylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Tetrachloroethene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
Tetrahydrofuran	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			
Toluene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
trans-1,2-Dichloroethene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
trans-1,3-Dichloropropene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
Trichloroethene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
Trichlorofluoromethane	0.0421	0.0050	mg/kg wet	0.05000		84	70-130			
Vinyl Acetate	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Vinyl Chloride	0.0393	0.0100	mg/kg wet	0.05000		79	70-130			
Xylene O	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
Xylene P,M	0.0995	0.0100	mg/kg wet	0.1000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0479*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
1,1,1-Trichloroethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
1,1,2,2-Tetrachloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,1,2-Trichloroethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,1-Dichloroethene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,1-Dichloropropene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
1,2,3-Trichlorobenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	5	25	
1,2,3-Trichloropropane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,2,4-Trichlorobenzene	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
1,2,4-Trimethylbenzene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
1,2-Dibromo-3-Chloropropane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	14	25	
1,2-Dibromoethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
1,2-Dichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
1,2-Dichloroethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,2-Dichloropropane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
1,3,5-Trimethylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	5	25	
1,3-Dichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,3-Dichloropropane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
1,4-Dichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,4-Dioxane	0.848	0.100	mg/kg wet	1.000		85	70-130	17	20	
1-Chlorohexane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	8	25	
2,2-Dichloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
2-Butanone	0.232	0.0500	mg/kg wet	0.2500		93	70-130	8	25	
2-Chlorotoluene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
2-Hexanone	0.236	0.0500	mg/kg wet	0.2500		95	70-130	13	25	
4-Chlorotoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
4-Isopropyltoluene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
4-Methyl-2-Pentanone	0.240	0.0500	mg/kg wet	0.2500		96	70-130	11	25	
Acetone	0.212	0.0500	mg/kg wet	0.2500		85	70-130	16	25	
Benzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	5	25	
Bromobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
Bromochloromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
Bromodichloromethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Bromoform	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
Bromomethane	0.0645	0.0100	mg/kg wet	0.05000		129	70-130	2	25	
Carbon Disulfide	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	7	25	
Carbon Tetrachloride	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
Chlorobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CH93024 - 5035										
Chloroethane	0.0409	0.0100	mg/kg wet	0.05000		82	70-130	5	25	
Chloroform	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Chloromethane	0.0359	0.0100	mg/kg wet	0.05000		72	70-130	6	25	
cis-1,2-Dichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
cis-1,3-Dichloropropene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	2	25	
Dibromochloromethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	3	25	
Dibromomethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Dichlorodifluoromethane	0.0365	0.0100	mg/kg wet	0.05000		73	70-130	7	25	
Diethyl Ether	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	4	25	
Di-isopropyl ether	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	3	25	
Ethyl tertiary-butyl ether	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
Ethylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
Hexachlorobutadiene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	7	25	
Isopropylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
Methyl tert-Butyl Ether	0.0574	0.0050	mg/kg wet	0.05000		115	70-130	5	25	
Methylene Chloride	0.0545	0.0250	mg/kg wet	0.05000		109	70-130	4	25	
Naphthalene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	12	25	
n-Butylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
n-Propylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
sec-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	7	25	
Styrene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
tert-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
Tertiary-amyl methyl ether	0.0608	0.0050	mg/kg wet	0.05000		122	70-130	7	25	
Tetrachloroethene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	5	25	
Tetrahydrofuran	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	10	25	
Toluene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
trans-1,2-Dichloroethene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	7	25	
trans-1,3-Dichloropropene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
Trichloroethene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	5	25	
Trichlorofluoromethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
Vinyl Acetate	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
Vinyl Chloride	0.0425	0.0100	mg/kg wet	0.05000		85	70-130	8	25	
Xylene O	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	6	25	
Xylene P,M	0.105	0.0100	mg/kg wet	0.1000		105	70-130	6	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0466*		mg/kg wet	*0.05000*		*93*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0478*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0485*		mg/kg wet	*0.05000*		*97*	*70-130*			
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI90432 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI90432 - 5035										
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
1-Chlorohexane	ND	0.200	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI90432 - 5035										
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	0.0900	0.400	mg/kg wet							J
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	0.0500	0.200	mg/kg wet							J
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Acetate	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.35*		mg/kg wet	*5.000*		*107*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.10*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*5.35*		mg/kg wet	*5.000*		*107*	*70-130*			
Surrogate: Toluene-d8	*5.10*		mg/kg wet	*5.000*		*102*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,1,1-Trichloroethane	2.12	0.200	mg/kg wet	2.000		106	70-130			
1,1,2,2-Tetrachloroethane	1.83	0.200	mg/kg wet	2.000		91	70-130			
1,1,2-Trichloroethane	1.95	0.200	mg/kg wet	2.000		98	70-130			
1,1-Dichloroethane	2.30	0.200	mg/kg wet	2.000		115	70-130			
1,1-Dichloroethene	2.43	0.200	mg/kg wet	2.000		122	70-130			
1,1-Dichloropropene	2.17	0.200	mg/kg wet	2.000		109	70-130			
1,2,3-Trichlorobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
1,2,3-Trichloropropane	1.82	0.200	mg/kg wet	2.000		91	70-130			
1,2,4-Trichlorobenzene	2.10	0.200	mg/kg wet	2.000		105	70-130			
1,2,4-Trimethylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130			
1,2-Dibromo-3-Chloropropane	1.46	1.00	mg/kg wet	2.000		73	70-130			
1,2-Dibromoethane	2.19	0.200	mg/kg wet	2.000		110	70-130			
1,2-Dichlorobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
1,2-Dichloroethane	2.13	0.200	mg/kg wet	2.000		106	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI90432 - 5035										
1,2-Dichloropropane	1.93	0.200	mg/kg wet	2.000		97	70-130			
1,3,5-Trimethylbenzene	2.11	0.200	mg/kg wet	2.000		106	70-130			
1,3-Dichlorobenzene	2.18	0.200	mg/kg wet	2.000		109	70-130			
1,3-Dichloropropane	2.10	0.200	mg/kg wet	2.000		105	70-130			
1,4-Dichlorobenzene	2.05	0.200	mg/kg wet	2.000		102	70-130			
1,4-Dioxane - Screen	54.7	40.0	mg/kg wet	40.00		137	44-241			
1-Chlorohexane	2.11	0.200	mg/kg wet	2.000		106	70-130			
2,2-Dichloropropane	2.33	0.200	mg/kg wet	2.000		116	70-130			
2-Butanone	10.3	1.00	mg/kg wet	10.00		103	70-130			
2-Chlorotoluene	2.23	0.200	mg/kg wet	2.000		111	70-130			
2-Hexanone	9.05	1.00	mg/kg wet	10.00		90	70-130			
4-Chlorotoluene	2.17	0.200	mg/kg wet	2.000		109	70-130			
4-Isopropyltoluene	2.10	0.200	mg/kg wet	2.000		105	70-130			
4-Methyl-2-Pentanone	8.45	1.00	mg/kg wet	10.00		84	70-130			
Acetone	10.0	1.00	mg/kg wet	10.00		100	70-130			
Benzene	2.24	0.200	mg/kg wet	2.000		112	70-130			
Bromobenzene	2.25	0.200	mg/kg wet	2.000		112	70-130			
Bromochloromethane	2.23	0.200	mg/kg wet	2.000		111	70-130			
Bromodichloromethane	1.85	0.200	mg/kg wet	2.000		93	70-130			
Bromoform	1.60	0.200	mg/kg wet	2.000		80	70-130			
Bromomethane	2.24	0.200	mg/kg wet	2.000		112	70-130			
Carbon Disulfide	2.40	0.200	mg/kg wet	2.000		120	70-130			
Carbon Tetrachloride	2.15	0.200	mg/kg wet	2.000		107	70-130			
Chlorobenzene	2.28	0.200	mg/kg wet	2.000		114	70-130			
Chloroethane	1.70	0.200	mg/kg wet	2.000		85	70-130			
Chloroform	2.24	0.200	mg/kg wet	2.000		112	70-130			
Chloromethane	1.89	0.200	mg/kg wet	2.000		94	70-130			
cis-1,2-Dichloroethene	2.17	0.200	mg/kg wet	2.000		108	70-130			
cis-1,3-Dichloropropene	2.00	0.200	mg/kg wet	2.000		100	70-130			
Dibromochloromethane	1.84	0.200	mg/kg wet	2.000		92	70-130			
Dibromomethane	2.14	0.200	mg/kg wet	2.000		107	70-130			
Dichlorodifluoromethane	1.65	0.200	mg/kg wet	2.000		82	70-130			
Diethyl Ether	1.84	0.200	mg/kg wet	2.000		92	70-130			
Di-isopropyl ether	2.24	0.200	mg/kg wet	2.000		112	70-130			
Ethyl tertiary-butyl ether	2.02	0.200	mg/kg wet	2.000		101	70-130			
Ethylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130			
Hexachlorobutadiene	2.14	0.200	mg/kg wet	2.000		107	70-130			
Isopropylbenzene	2.25	0.200	mg/kg wet	2.000		113	70-130			
Methyl tert-Butyl Ether	2.02	0.200	mg/kg wet	2.000		101	70-130			
Methylene Chloride	2.35	0.400	mg/kg wet	2.000		118	70-130			
Naphthalene	1.87	0.200	mg/kg wet	2.000		93	70-130			
n-Butylbenzene	2.32	0.200	mg/kg wet	2.000		116	70-130			
n-Propylbenzene	2.18	0.200	mg/kg wet	2.000		109	70-130			
sec-Butylbenzene	2.11	0.200	mg/kg wet	2.000		105	70-130			
Styrene	2.14	0.200	mg/kg wet	2.000		107	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI90432 - 5035										
tert-Butylbenzene	2.18	0.200	mg/kg wet	2.000		109	70-130			
Tertiary-amyl methyl ether	2.08	0.200	mg/kg wet	2.000		104	70-130			
Tetrachloroethene	2.02	0.200	mg/kg wet	2.000		101	70-130			
Tetrahydrofuran	2.18	1.00	mg/kg wet	2.000		109	70-130			
Toluene	2.17	0.200	mg/kg wet	2.000		108	70-130			
trans-1,2-Dichloroethene	2.32	0.200	mg/kg wet	2.000		116	70-130			
trans-1,3-Dichloropropene	1.99	0.200	mg/kg wet	2.000		100	70-130			
Trichloroethene	2.07	0.200	mg/kg wet	2.000		103	70-130			
Trichlorofluoromethane	2.24	0.200	mg/kg wet	2.000		112	70-130			
Vinyl Acetate	1.90	0.200	mg/kg wet	2.000		95	70-130			
Vinyl Chloride	1.88	0.200	mg/kg wet	2.000		94	70-130			
Xylene O	2.14	0.200	mg/kg wet	2.000		107	70-130			
Xylene P,M	4.43	0.400	mg/kg wet	4.000		111	70-130			
Surrogate: 1,2-Dichloroethane-d4	*4.00*		mg/kg wet	*5.000*		*80*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.59*		mg/kg wet	*5.000*		*92*	*70-130*			
Surrogate: Dibromofluoromethane	*4.21*		mg/kg wet	*5.000*		*84*	*70-130*			
Surrogate: Toluene-d8	*4.14*		mg/kg wet	*5.000*		*83*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	1.99	0.200	mg/kg wet	2.000		100	70-130	4	25	
1,1,1-Trichloroethane	2.13	0.200	mg/kg wet	2.000		106	70-130	0.5	25	
1,1,2,2-Tetrachloroethane	1.71	0.200	mg/kg wet	2.000		86	70-130	6	25	
1,1,2-Trichloroethane	1.87	0.200	mg/kg wet	2.000		93	70-130	4	25	
1,1-Dichloroethane	2.29	0.200	mg/kg wet	2.000		114	70-130	0.3	25	
1,1-Dichloroethene	2.26	0.200	mg/kg wet	2.000		113	70-130	7	25	
1,1-Dichloropropene	2.09	0.200	mg/kg wet	2.000		104	70-130	4	25	
1,2,3-Trichlorobenzene	1.86	0.200	mg/kg wet	2.000		93	70-130	15	25	
1,2,3-Trichloropropane	1.81	0.200	mg/kg wet	2.000		90	70-130	0.4	25	
1,2,4-Trichlorobenzene	1.93	0.200	mg/kg wet	2.000		97	70-130	8	25	
1,2,4-Trimethylbenzene	2.07	0.200	mg/kg wet	2.000		103	70-130	3	25	
1,2-Dibromo-3-Chloropropane	1.33	1.00	mg/kg wet	2.000		66	70-130	10	25	B-
1,2-Dibromoethane	2.10	0.200	mg/kg wet	2.000		105	70-130	4	25	
1,2-Dichlorobenzene	2.12	0.200	mg/kg wet	2.000		106	70-130	2	25	
1,2-Dichloroethane	2.22	0.200	mg/kg wet	2.000		111	70-130	4	25	
1,2-Dichloropropane	1.99	0.200	mg/kg wet	2.000		99	70-130	3	25	
1,3,5-Trimethylbenzene	2.09	0.200	mg/kg wet	2.000		105	70-130	0.9	25	
1,3-Dichlorobenzene	2.13	0.200	mg/kg wet	2.000		107	70-130	2	25	
1,3-Dichloropropane	2.22	0.200	mg/kg wet	2.000		111	70-130	5	25	
1,4-Dichlorobenzene	2.09	0.200	mg/kg wet	2.000		104	70-130	2	25	
1,4-Dioxane - Screen	ND	40.0	mg/kg wet	40.00		0	44-241	200	200	B-
1-Chlorohexane	2.11	0.200	mg/kg wet	2.000		105	70-130	0.3	25	
2,2-Dichloropropane	2.32	0.200	mg/kg wet	2.000		116	70-130	0.3	25	
2-Butanone	10.1	1.00	mg/kg wet	10.00		101	70-130	2	25	
2-Chlorotoluene	2.22	0.200	mg/kg wet	2.000		111	70-130	0.09	25	
2-Hexanone	8.53	1.00	mg/kg wet	10.00		85	70-130	6	25	
4-Chlorotoluene	2.21	0.200	mg/kg wet	2.000		111	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI90432 - 5035										
4-Isopropyltoluene	2.02	0.200	mg/kg wet	2.000		101	70-130	4	25	
4-Methyl-2-Pentanone	8.23	1.00	mg/kg wet	10.00		82	70-130	3	25	
Acetone	8.97	1.00	mg/kg wet	10.00		90	70-130	11	25	
Benzene	2.17	0.200	mg/kg wet	2.000		109	70-130	3	25	
Bromobenzene	2.30	0.200	mg/kg wet	2.000		115	70-130	2	25	
Bromochloromethane	2.26	0.200	mg/kg wet	2.000		113	70-130	2	25	
Bromodichloromethane	1.97	0.200	mg/kg wet	2.000		99	70-130	6	25	
Bromoform	1.61	0.200	mg/kg wet	2.000		80	70-130	0.2	25	
Bromomethane	2.17	0.200	mg/kg wet	2.000		108	70-130	4	25	
Carbon Disulfide	2.34	0.200	mg/kg wet	2.000		117	70-130	2	25	
Carbon Tetrachloride	2.09	0.200	mg/kg wet	2.000		105	70-130	2	25	
Chlorobenzene	2.24	0.200	mg/kg wet	2.000		112	70-130	1	25	
Chloroethane	1.86	0.200	mg/kg wet	2.000		93	70-130	9	25	
Chloroform	2.26	0.200	mg/kg wet	2.000		113	70-130	1	25	
Chloromethane	1.94	0.200	mg/kg wet	2.000		97	70-130	3	25	
cis-1,2-Dichloroethene	2.16	0.200	mg/kg wet	2.000		108	70-130	0.2	25	
cis-1,3-Dichloropropene	2.06	0.200	mg/kg wet	2.000		103	70-130	3	25	
Dibromochloromethane	1.87	0.200	mg/kg wet	2.000		94	70-130	2	25	
Dibromomethane	2.08	0.200	mg/kg wet	2.000		104	70-130	3	25	
Dichlorodifluoromethane	1.57	0.200	mg/kg wet	2.000		79	70-130	5	25	
Diethyl Ether	1.78	0.200	mg/kg wet	2.000		89	70-130	4	25	
Di-isopropyl ether	2.26	0.200	mg/kg wet	2.000		113	70-130	1	25	
Ethyl tertiary-butyl ether	1.97	0.200	mg/kg wet	2.000		99	70-130	2	25	
Ethylbenzene	2.18	0.200	mg/kg wet	2.000		109	70-130	3	25	
Hexachlorobutadiene	2.02	0.200	mg/kg wet	2.000		101	70-130	6	25	
Isopropylbenzene	2.16	0.200	mg/kg wet	2.000		108	70-130	4	25	
Methyl tert-Butyl Ether	2.00	0.200	mg/kg wet	2.000		100	70-130	1	25	
Methylene Chloride	2.38	0.400	mg/kg wet	2.000		119	70-130	1	25	
Naphthalene	1.73	0.200	mg/kg wet	2.000		86	70-130	8	25	
n-Butylbenzene	2.20	0.200	mg/kg wet	2.000		110	70-130	6	25	
n-Propylbenzene	2.14	0.200	mg/kg wet	2.000		107	70-130	2	25	
sec-Butylbenzene	2.10	0.200	mg/kg wet	2.000		105	70-130	0.3	25	
Styrene	2.14	0.200	mg/kg wet	2.000		107	70-130	0.2	25	
tert-Butylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130	3	25	
Tertiary-amyl methyl ether	2.07	0.200	mg/kg wet	2.000		103	70-130	0.9	25	
Tetrachloroethene	2.04	0.200	mg/kg wet	2.000		102	70-130	0.8	25	
Tetrahydrofuran	1.98	1.00	mg/kg wet	2.000		99	70-130	10	25	
Toluene	2.13	0.200	mg/kg wet	2.000		107	70-130	1	25	
trans-1,2-Dichloroethene	2.30	0.200	mg/kg wet	2.000		115	70-130	0.6	25	
trans-1,3-Dichloropropene	1.94	0.200	mg/kg wet	2.000		97	70-130	3	25	
Trichloroethene	2.21	0.200	mg/kg wet	2.000		111	70-130	7	25	
Trichlorofluoromethane	2.24	0.200	mg/kg wet	2.000		112	70-130	0.2	25	
Vinyl Acetate	1.84	0.200	mg/kg wet	2.000		92	70-130	3	25	
Vinyl Chloride	2.02	0.200	mg/kg wet	2.000		101	70-130	7	25	
Xylene O	2.22	0.200	mg/kg wet	2.000		111	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI90432 - 5035										
Xylene P,M	4.38	0.400	mg/kg wet	4.000		110	70-130	1	25	
Surrogate: 1,2-Dichloroethane-d4	*3.91*		mg/kg wet	*5.000*		*78*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.67*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*4.17*		mg/kg wet	*5.000*		*83*	*70-130*			
Surrogate: Toluene-d8	*4.24*		mg/kg wet	*5.000*		*85*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CI90307 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							
Aroclor 1268	ND	0.02	mg/kg wet							
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0229*		mg/kg wet	*0.02500*		*92*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0242*		mg/kg wet	*0.02500*		*97*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0161*		mg/kg wet	*0.02500*		*65*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0208*		mg/kg wet	*0.02500*		*83*	*30-150*			
LCS										
Aroclor 1016	0.4	0.05	mg/kg wet	0.5000		89	40-140			
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		103	40-140			
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		100	40-140			
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		98	40-140			
Surrogate: Decachlorobiphenyl	*0.0231*		mg/kg wet	*0.02500*		*92*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0246*		mg/kg wet	*0.02500*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0181*		mg/kg wet	*0.02500*		*72*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0208*		mg/kg wet	*0.02500*		*83*	*30-150*			
LCS Dup										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		92	40-140	4	30	
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		106	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CI90307 - 3540C										
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		104	40-140	4	30	
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		101	40-140	3	30	
Surrogate: Decachlorobiphenyl	*0.0239*		mg/kg wet	*0.02500*		*96*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0254*		mg/kg wet	*0.02500*		*102*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0190*		mg/kg wet	*0.02500*		*76*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0216*		mg/kg wet	*0.02500*		*86*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CH93012 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	16.2	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.66*		mg/kg wet	*5.000*		*93*	*40-140*			
LCS										
Decane (C10)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		102	40-140			
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Eicosane (C20)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		98	40-140			
Hexadecane (C16)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		106	40-140			
Nonane (C9)	1.8	0.2	mg/kg wet	2.500		74	30-140			
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Octadecane (C18)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Total Petroleum Hydrocarbons	32.4	37.5	mg/kg wet	35.00		93	40-140			
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Surrogate: O-Terphenyl	*4.98*		mg/kg wet	*5.000*		*100*	*40-140*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CH93012 - 3546										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		71	40-140	14	25	
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		88	40-140	14	25	
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		77	40-140	12	25	
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		87	40-140	15	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		85	40-140	14	25	
Hexadecane (C16)	2.1	0.2	mg/kg wet	2.500		84	40-140	14	25	
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		92	40-140	14	25	
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		64	30-140	14	25	
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		83	40-140	14	25	
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		88	40-140	14	25	
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		87	40-140	14	25	
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		81	40-140	13	25	
Total Petroleum Hydrocarbons	28.2	37.5	mg/kg wet	35.00		81	40-140	14	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		80	40-140	13	25	
Surrogate: O-Terphenyl	*4.30*		mg/kg wet	*5.000*		*86*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Blank										
1,1-Biphenyl	ND	0.100	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.167	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.167	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.167	mg/kg wet							
Benzo(a)pyrene	ND	0.067	mg/kg wet							
Benzo(b)fluoranthene	ND	0.167	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.100	mg/kg wet							
Benzo(k)fluoranthene	ND	0.167	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.100	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.067	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.067	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.067	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.167	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.083	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*1.99*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.55*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.17*		mg/kg wet	*5.000*		*63*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.27*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2-Fluorophenol	*2.98*		mg/kg wet	*5.000*		*60*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.08*		mg/kg wet	*3.333*		*62*	*30-130*			
Surrogate: Phenol-d6	*2.90*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.89*		mg/kg wet	*3.333*		*87*	*30-130*			
LCS										
1,1-Biphenyl	2.18	0.100	mg/kg wet	3.333		66	40-140			
1,2,4-Trichlorobenzene	2.21	0.333	mg/kg wet	3.333		66	40-140			
1,2-Dichlorobenzene	1.98	0.333	mg/kg wet	3.333		59	40-140			
1,3-Dichlorobenzene	1.88	0.333	mg/kg wet	3.333		56	40-140			
1,4-Dichlorobenzene	1.87	0.333	mg/kg wet	3.333		56	40-140			
2,3,4,6-Tetrachlorophenol	2.95	1.67	mg/kg wet	3.333		88	30-130			
2,4,5-Trichlorophenol	2.86	0.333	mg/kg wet	3.333		86	30-130			
2,4,6-Trichlorophenol	2.56	0.333	mg/kg wet	3.333		77	30-130			
2,4-Dichlorophenol	2.43	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dimethylphenol	2.10	0.333	mg/kg wet	3.333		63	30-130			
2,4-Dinitrophenol	2.79	1.67	mg/kg wet	3.333		84	30-130			
2,4-Dinitrotoluene	2.76	0.167	mg/kg wet	3.333		83	40-140			
2,6-Dinitrotoluene	2.78	0.333	mg/kg wet	3.333		83	40-140			
2-Chloronaphthalene	2.16	0.333	mg/kg wet	3.333		65	40-140			
2-Chlorophenol	1.90	0.333	mg/kg wet	3.333		57	30-130			
2-Methylnaphthalene	2.24	0.333	mg/kg wet	3.333		67	40-140			
2-Methylphenol	1.93	0.333	mg/kg wet	3.333		58	30-130			
2-Nitroaniline	1.88	0.333	mg/kg wet	3.333		56	40-140			
2-Nitrophenol	1.99	0.333	mg/kg wet	3.333		60	30-130			
3,3´-Dichlorobenzidine	2.86	0.167	mg/kg wet	3.333		86	40-140			
3+4-Methylphenol	4.34	0.667	mg/kg wet	6.667		65	30-130			
3-Nitroaniline	2.31	0.333	mg/kg wet	3.333		69	40-140			
4,6-Dinitro-2-Methylphenol	2.83	1.67	mg/kg wet	3.333		85	30-130			
4-Bromophenyl-phenylether	3.15	0.333	mg/kg wet	3.333		95	40-140			
4-Chloro-3-Methylphenol	2.59	0.333	mg/kg wet	3.333		78	30-130			
4-Chloroaniline	1.66	0.667	mg/kg wet	3.333		50	40-140			
4-Chloro-phenyl-phenyl ether	2.85	0.333	mg/kg wet	3.333		85	40-140			
4-Nitroaniline	2.39	0.333	mg/kg wet	3.333		72	40-140			
4-Nitrophenol	1.96	1.67	mg/kg wet	3.333		59	30-130			
Acenaphthene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Acenaphthylene	2.08	0.333	mg/kg wet	3.333		63	40-140			
Acetophenone	1.73	0.667	mg/kg wet	3.333		52	40-140			
Aniline	1.29	0.667	mg/kg wet	3.333		39	40-140			B-

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Anthracene	2.67	0.333	mg/kg wet	3.333		80	40-140			
Azobenzene	2.04	0.333	mg/kg wet	3.333		61	40-140			
Benzo(a)anthracene	2.87	0.167	mg/kg wet	3.333		86	40-140			
Benzo(a)pyrene	2.64	0.067	mg/kg wet	3.333		79	40-140			
Benzo(b)fluoranthene	2.63	0.167	mg/kg wet	3.333		79	40-140			
Benzo(g,h,i)perylene	2.80	0.100	mg/kg wet	3.333		84	40-140			
Benzo(k)fluoranthene	2.68	0.167	mg/kg wet	3.333		80	40-140			
Benzoic Acid	2.35	1.67	mg/kg wet	3.333		70	40-140			
Benzyl Alcohol	1.46	0.333	mg/kg wet	3.333		44	40-140			
bis(2-Chloroethoxy)methane	1.76	0.333	mg/kg wet	3.333		53	40-140			
bis(2-Chloroethyl)ether	1.73	0.100	mg/kg wet	3.333		52	40-140			
bis(2-chloroisopropyl)Ether	1.77	0.333	mg/kg wet	3.333		53	40-140			
bis(2-Ethylhexyl)phthalate	2.94	0.333	mg/kg wet	3.333		88	40-140			
Butylbenzylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140			
Carbazole	2.74	0.333	mg/kg wet	3.333		82	40-140			
Chrysene	2.72	0.067	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.72	0.067	mg/kg wet	3.333		82	40-140			
Dibenzofuran	2.46	0.333	mg/kg wet	3.333		74	40-140			
Diethylphthalate	2.81	0.333	mg/kg wet	3.333		84	40-140			
Dimethylphthalate	2.82	0.333	mg/kg wet	3.333		85	40-140			
Di-n-butylphthalate	3.15	0.333	mg/kg wet	3.333		94	40-140			
Di-n-octylphthalate	2.92	0.333	mg/kg wet	3.333		88	40-140			
Fluoranthene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Fluorene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Hexachlorobenzene	3.17	0.067	mg/kg wet	3.333		95	40-140			
Hexachlorobutadiene	2.21	0.333	mg/kg wet	3.333		66	40-140			
Hexachlorocyclopentadiene	1.28	1.67	mg/kg wet	3.333		38	40-140			B-
Hexachloroethane	1.63	0.333	mg/kg wet	3.333		49	40-140			
Indeno(1,2,3-cd)Pyrene	2.70	0.167	mg/kg wet	3.333		81	40-140			
Isophorone	1.54	0.333	mg/kg wet	3.333		46	40-140			
Naphthalene	2.00	0.083	mg/kg wet	3.333		60	40-140			
Nitrobenzene	1.60	0.333	mg/kg wet	3.333		48	40-140			
N-Nitrosodimethylamine	1.64	0.333	mg/kg wet	3.333		49	40-140			
N-Nitroso-Di-n-Propylamine	1.64	0.333	mg/kg wet	3.333		49	40-140			
N-nitrosodiphenylamine	2.79	0.333	mg/kg wet	3.333		84	40-140			
Pentachlorophenol	3.18	0.333	mg/kg wet	3.333		95	30-130			
Phenanthrene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Phenol	1.80	0.333	mg/kg wet	3.333		54	30-130			
Pyrene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Pyridine	1.61	1.67	mg/kg wet	3.333		48	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.81*		mg/kg wet	*3.333*		*54*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.62*		mg/kg wet	*5.000*		*92*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*2.95*		mg/kg wet	*5.000*		*59*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.29*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2-Fluorophenol	*2.90*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.78*		mg/kg wet	*3.333*		*53*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Surrogate: Phenol-d6	*2.80*		mg/kg wet	*5.000*		*56*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.92*		mg/kg wet	*3.333*		*88*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.16	0.100	mg/kg wet	3.333		65	40-140	1	30	
1,2,4-Trichlorobenzene	2.24	0.333	mg/kg wet	3.333		67	40-140	1	30	
1,2-Dichlorobenzene	2.00	0.333	mg/kg wet	3.333		60	40-140	1	30	
1,3-Dichlorobenzene	1.92	0.333	mg/kg wet	3.333		57	40-140	2	30	
1,4-Dichlorobenzene	1.87	0.333	mg/kg wet	3.333		56	40-140	0.03	30	
2,3,4,6-Tetrachlorophenol	2.88	1.67	mg/kg wet	3.333		86	30-130	2	30	
2,4,5-Trichlorophenol	2.77	0.333	mg/kg wet	3.333		83	30-130	3	30	
2,4,6-Trichlorophenol	2.51	0.333	mg/kg wet	3.333		75	30-130	2	30	
2,4-Dichlorophenol	2.39	0.333	mg/kg wet	3.333		72	30-130	1	30	
2,4-Dimethylphenol	2.07	0.333	mg/kg wet	3.333		62	30-130	1	30	
2,4-Dinitrophenol	2.70	1.67	mg/kg wet	3.333		81	30-130	3	30	
2,4-Dinitrotoluene	2.71	0.167	mg/kg wet	3.333		81	40-140	2	30	
2,6-Dinitrotoluene	2.79	0.333	mg/kg wet	3.333		84	40-140	0.2	30	
2-Chloronaphthalene	2.11	0.333	mg/kg wet	3.333		63	40-140	3	30	
2-Chlorophenol	1.98	0.333	mg/kg wet	3.333		59	30-130	4	30	
2-Methylnaphthalene	2.21	0.333	mg/kg wet	3.333		66	40-140	1	30	
2-Methylphenol	1.93	0.333	mg/kg wet	3.333		58	30-130	0.009	30	
2-Nitroaniline	1.87	0.333	mg/kg wet	3.333		56	40-140	0.2	30	
2-Nitrophenol	1.92	0.333	mg/kg wet	3.333		58	30-130	3	30	
3,3´-Dichlorobenzidine	2.72	0.167	mg/kg wet	3.333		82	40-140	5	30	
3+4-Methylphenol	4.39	0.667	mg/kg wet	6.667		66	30-130	1	30	
3-Nitroaniline	2.30	0.333	mg/kg wet	3.333		69	40-140	0.3	30	
4,6-Dinitro-2-Methylphenol	2.75	1.67	mg/kg wet	3.333		83	30-130	3	30	
4-Bromophenyl-phenylether	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
4-Chloro-3-Methylphenol	2.54	0.333	mg/kg wet	3.333		76	30-130	2	30	
4-Chloroaniline	1.65	0.667	mg/kg wet	3.333		49	40-140	0.9	30	
4-Chloro-phenyl-phenyl ether	2.71	0.333	mg/kg wet	3.333		81	40-140	5	30	
4-Nitroaniline	2.37	0.333	mg/kg wet	3.333		71	40-140	1	30	
4-Nitrophenol	1.83	1.67	mg/kg wet	3.333		55	30-130	7	30	
Acenaphthene	2.34	0.333	mg/kg wet	3.333		70	40-140	0.7	30	
Acenaphthylene	2.08	0.333	mg/kg wet	3.333		62	40-140	0.2	30	
Acetophenone	1.77	0.667	mg/kg wet	3.333		53	40-140	2	30	
Aniline	1.30	0.667	mg/kg wet	3.333		39	40-140	0.5	30	B-
Anthracene	2.63	0.333	mg/kg wet	3.333		79	40-140	1	30	
Azobenzene	2.01	0.333	mg/kg wet	3.333		60	40-140	2	30	
Benzo(a)anthracene	2.74	0.167	mg/kg wet	3.333		82	40-140	5	30	
Benzo(a)pyrene	2.57	0.067	mg/kg wet	3.333		77	40-140	3	30	
Benzo(b)fluoranthene	2.50	0.167	mg/kg wet	3.333		75	40-140	5	30	
Benzo(g,h,i)perylene	2.82	0.100	mg/kg wet	3.333		85	40-140	0.8	30	
Benzo(k)fluoranthene	2.71	0.167	mg/kg wet	3.333		81	40-140	1	30	
Benzoic Acid	2.31	1.67	mg/kg wet	3.333		69	40-140	2	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CH93011 - 3546										
Benzyl Alcohol	1.49	0.333	mg/kg wet	3.333		45	40-140	2	30	
bis(2-Chloroethoxy)methane	1.80	0.333	mg/kg wet	3.333		54	40-140	2	30	
bis(2-Chloroethyl)ether	1.79	0.100	mg/kg wet	3.333		54	40-140	4	30	
bis(2-chloroisopropyl)Ether	1.83	0.333	mg/kg wet	3.333		55	40-140	3	30	
bis(2-Ethylhexyl)phthalate	2.70	0.333	mg/kg wet	3.333		81	40-140	8	30	
Butylbenzylphthalate	2.65	0.333	mg/kg wet	3.333		79	40-140	9	30	
Carbazole	2.64	0.333	mg/kg wet	3.333		79	40-140	4	30	
Chrysene	2.68	0.067	mg/kg wet	3.333		81	40-140	1	30	
Dibenzo(a,h)Anthracene	2.77	0.067	mg/kg wet	3.333		83	40-140	2	30	
Dibenzofuran	2.47	0.333	mg/kg wet	3.333		74	40-140	0.1	30	
Diethylphthalate	2.82	0.333	mg/kg wet	3.333		84	40-140	0.2	30	
Dimethylphthalate	2.81	0.333	mg/kg wet	3.333		84	40-140	0.3	30	
Di-n-butylphthalate	2.89	0.333	mg/kg wet	3.333		87	40-140	9	30	
Di-n-octylphthalate	2.72	0.333	mg/kg wet	3.333		82	40-140	7	30	
Fluoranthene	2.85	0.333	mg/kg wet	3.333		85	40-140	6	30	
Fluorene	2.64	0.333	mg/kg wet	3.333		79	40-140	0.2	30	
Hexachlorobenzene	3.07	0.067	mg/kg wet	3.333		92	40-140	3	30	
Hexachlorobutadiene	2.12	0.333	mg/kg wet	3.333		64	40-140	4	30	
Hexachlorocyclopentadiene	1.28	1.67	mg/kg wet	3.333		38	40-140	0.03	30	B-
Hexachloroethane	1.63	0.333	mg/kg wet	3.333		49	40-140	0.3	30	
Indeno(1,2,3-cd)Pyrene	2.76	0.167	mg/kg wet	3.333		83	40-140	2	30	
Isophorone	1.53	0.333	mg/kg wet	3.333		46	40-140	0.4	30	
Naphthalene	2.00	0.083	mg/kg wet	3.333		60	40-140	0.1	30	
Nitrobenzene	1.60	0.333	mg/kg wet	3.333		48	40-140	0.05	30	
N-Nitrosodimethylamine	1.27	0.333	mg/kg wet	3.333		38	40-140	26	30	B-
N-Nitroso-Di-n-Propylamine	1.71	0.333	mg/kg wet	3.333		51	40-140	4	30	
N-nitrosodiphenylamine	2.78	0.333	mg/kg wet	3.333		83	40-140	0.2	30	
Pentachlorophenol	3.13	0.333	mg/kg wet	3.333		94	30-130	2	30	
Phenanthrene	2.63	0.333	mg/kg wet	3.333		79	40-140	4	30	
Phenol	1.80	0.333	mg/kg wet	3.333		54	30-130	0.3	30	
Pyrene	2.67	0.333	mg/kg wet	3.333		80	40-140	5	30	
Pyridine	1.31	1.67	mg/kg wet	3.333		39	40-140	21	30	B-
Surrogate: 1,2-Dichlorobenzene-d4	*1.79*		mg/kg wet	*3.333*		*54*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.32*		mg/kg wet	*5.000*		*86*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*2.91*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.22*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: 2-Fluorophenol	*3.12*		mg/kg wet	*5.000*		*62*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.72*		mg/kg wet	*3.333*		*52*	*30-130*			
Surrogate: Phenol-d6	*2.75*		mg/kg wet	*5.000*		*55*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.76*		mg/kg wet	*3.333*		*83*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

Notes and Definitions

Z18	Temperature is not within 23 +/-2 ºC.
U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
SC	Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
Q	Calibration required quadratic regression (Q).
PT	Pentachlorophenol tailing factor > 2.
J	Reported between MDL and MRL
IC	Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 19H0999

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

Shipped/Delivered Via: Client

ESS Project ID: 19H0999
Date Received: 8/30/2019
Project Due Date: 9/9/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 8/30/19 Time: 1452 By: U

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	383141	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	383148	Yes	NA	Yes	VOA Vial - Other	Other	
01	383149	Yes	NA	Yes	VOA Vial - Other	Other	
01	383153	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	383140	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	383146	Yes	NA	Yes	VOA Vial - Other	Other	
02	383147	Yes	NA	Yes	VOA Vial - Other	Other	
02	383152	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	383139	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	383144	Yes	NA	Yes	VOA Vial - Other	Other	
03	383145	Yes	NA	Yes	VOA Vial - Other	Other	
03	383151	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	383138	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	383142	Yes	NA	Yes	VOA Vial - Other	Other	
04	383143	Yes	NA	Yes	VOA Vial - Other	Other	
04	383150	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/ML

ESS Project ID: 19H0999
Date Received: 8/30/2019

Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 8/30/19 1440

Reviewed By: _____ Date & Time: 8/30/19 1453

Delivered By: _____ 8/30/19 1453

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time	Std	Days	
Regulatory State	RI		
Is this project for any of the following?:	○CT RCP	○MA MCP	○RGP

ESS Lab # 1910999

Reporting Limits: RIDEM RaDEC/IcDEC

Electonic Deliverables: ☒Data Checker ☒Excel ☐Other (Please Specify →)

Company Name	Project #	Project Name
Beta Group		NBC IIIA-4 and IIIA-5

Contact Person	Address
Joe McLoughlin	701 Georgia Washington Hwy

City	State	Zip Code	PO #
Lincoln	RI	02865	

Telephone Number	FAX Number	Email Address
401.333.2382		jmcloughlin@beta-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	PR 13 metals
1	8/30/19	8:20	Grab	Soil	B-7 0-2'	X	X	X	X	X
2	↓	8:35	↓	↓	B-7 2-4'	X	X	X	X	X
3	↓	8:50	↓	↓	B-7 4-6'	X	X	X	X	X
4	↓	9:10	Comp	↓	B-7 6-10'	X	X	X	X	X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V	AG	—	—	—	—							
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*	7	10	—	—	—						
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*	6/16	1	—	—	—						
Number of Containers per Sample:												3	1	1	1	1						

Laboratory Use Only

Cooler Present: Y ○Drop Off
Seals Intact: NA ○Pickup
Cooler Temperature: 4.8 °C

Sampled by: Scott Nec

Comments: Please specify "Other" preservative and containers types in this space

20X Rule as per client jjs 9/6/19

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
8/30/19 13:37	8/30/19 1337		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time	Std	Days	
Regulatory State	RI		
Is this project for any of the following?:	○CT RCP	○MA MCP	○RGP

ESS Lab # 1910999

Reporting Limits: RIDEM RaDEC/IcDEC

Electonic Deliverables: ☒Data Checker ☒Excel ☐Other (Please Specify →)

Company Name	Project #	Project Name
Beta Group		NBC IIIA-4 and IIIA-5

Contact Person	Address
Joe McLoughlin	701 Georgia Washington Hwy

City	State	Zip Code	PO #
Lincoln	RI	02865	

Telephone Number	FAX Number	Email Address
401.333.2382		jmcloughlin@beta-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	TPH	PCBs	RCRA metals
1	8/30/19	8:20	Grab	Soil	B-7 0-2'	X	X	X	X	X
2		8:35			B-7 2-4'	X	X	X	X	X
3		8:50			B-7 4-6'	X	X	X	X	X
4		9:10	Comp		B-7 6-10'	X	X	X	X	X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V	AG	—	—	—	—							
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*	7	10	—	—	—						
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*	6/16	1	—	—	—						
Number of Containers per Sample:												3	1	1	1	1						

Laboratory Use Only

Cooler Present: Y ○Drop Off
Seals Intact: NA ○Pickup
Cooler Temperature: 4.8 °C

Sampled by: Scott Nec

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
8/30/19 13:37	8/30/19 1337		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

APPENDIX G

GROUNDWATER SAMPLING LOGS

WELL SAMPLING LOG

Project No.	6412
Well ID	MW-4
Page #	1
Date	3/12/2020
Sampler	SN

Equipment Used: Geotech pump and YSI 6820

Calibratrion Performed (Ask for zero calib of DO)

A: Set Up:

Well/Road Box condition: Okay

Well Gauging Reference Point: (i.e. road box, PVC casing): Top of PVC

Well Screen Depth Interval Reference Point:

Bottom Depth (if known, if not known do not measure as it will increase turbidity): 24'

Initial Groundwater Depth from reference point: 17.93'

Pump Intake Depth:

B: Flow Rate

B-1 - Calculated Allowable Drawdown

Calculated Depth not to exceed: 18.23'

B-2 - Measure Flow Rate (generally 100 to 500 ml/min) (VOA Vials are 40 ml)

Volume/Time= 40 mL/30 seconds

Allowable Drawdown Exceeded (Y/N N

(if water table was in screen interval, allowable drawdown can be exceeded if at lowest flow setting

C: Stabilization

C-1 - Calculate Time Interval for Independent Water Quality Readings

(Flow-thru cell volume approx. 400 ml) (Cell volume/flow rate generally 2-4 min.)

Cell Volume/Flow Rate=

C-2 - Measure Stabilized Water Quality parameters and Turbidity

Time	Temperature	SpCond	DO	pH	ORP	Turbidity	Water Depth	Flow	Comments
hr:min	Celsius	uS/cm	mg/L	units	mV	NTU	ft.	ml/min	
Criteria		3%	10% or 0.2	0.2	20 mV	10% or <1			
10:35	**12.49**	**1,204**	**2.18**	**6.55**	**79.7**	**--**	**17.98**	**80**	
10:40	**12.3**	**1,221**	**1.84**	**6.54**	**80.5**	**--**	**18.01**	**80**	
10:45	**12.24**	**1,238**	**1.49**	**6.53**	**81.7**	**--**	**18.05**	**80**	
10:50	**12.35**	**1,231**	**1.33**	**6.53**	**79.8**	**--**	**18.11**	**80**	
10:55	**12.37**	**1,221**	**1.28**	**6.53**	**77.3**	**--**	**18.18**	**80**	
11:00	**12.39**	**1,219**	**1.26**	**6.52**	**76.1**	**--**	**18.16**	**80**	

). Sample Collection

Sample from pump discharge line (if not disconnected from flow thru cell, decon and filed bland are needed)

Appearance of sample water: Clear

Sample Time: 9:43

WELL SAMPLING LOG

Project No.	6412
Well ID	MW-7
Page #	1
Date	3/12/2020
Sampler	SN

Equipment Used: Geotech pump and YSI 6820

Calibratrion Performed (Ask for zero calib of DO)

A: Set Up:

Well/Road Box condition: Okay

Well Gauging Reference Point: (i.e. road box, PVC casing): Top of PVC

Well Screen Depth Interval Reference Point:

Bottom Depth (if known, if not known do not measure as it will increase turbidity): 20.0

Initial Groundwater Depth from reference point: 8.32

Pump Intake Depth:

B: Flow Rate

B-1 - Calculated Allowable Drawdown

Calculated Depth not to exceed: 8.62'

B-2 - Measure Flow Rate (generally 100 to 500 ml/min) (VOA Vials are 40 ml)

Volume/Time= 40 mL/30 seconds

Allowable Drawdown Exceeded (Y/N N

(if water table was in screen interval, allowable drawdown can be exceeded if at lowest flow setting

C: Stabilization

C-1 - Calculate Time Interval for Independent Water Quality Readings

(Flow-thru cell volume approx. 400 ml) (Cell volume/flow rate generally 2-4 min.)

Cell Volume/Flow Rate=

C-2 - Measure Stabilized Water Quality parameters and Turbidity

Time	Temperature	SpCond	DO	pH	ORP	Turbidity	Water Depth	Flow	Comments
hr:min	Celsius	uS/cm	mg/L	units	mV	NTU	ft.	ml/min	
Criteria		3%	10% or 0.2	0.2	20 mV	10% or <1			
8:55	**11.21**	**607**	**2.78**	**7.14**	**-78.90**	**--**	**8.35**	**80**	
9:00	**11.68**	**619**	**1.50**	**6.99**	**-56.60**	**--**	**8.37**	**80**	
9:05	**11.63**	**604**	**1.41**	**6.90**	**-41.80**	**--**	**8.39**	**80**	
9:10	**11.59**	**589**	**1.23**	**6.83**	**-37.50**	**--**	**8.41**	**80**	
9:15	**11.53**	**611**	**1.21**	**6.80**	**-23.40**	**--**	**8.43**	**80**	
9:20	**11.49**	**627**	**1.18**	**6.77**	**-3.00**	**--**	**8.44**	**80**	
9:25	**11.51**	**622**	**1.16**	**6.77**	**-4.90**	**--**	**8.45**	**80**	
9:30	**11.53**	**623**	**1.15**	**6.77**	**-6.00**	**--**	**8.46**	**80**	
9:35	**11.56**	**626**	**1.15**	**6.77**	**-6.80**	**--**	**8.48**	**80**	

). Sample Collection

Sample from pump discharge line (if not disconnected from flow thru cell, decon and filed bland are needed)

Appearance of sample water: Clear

Sample Time: 9:35

APPENDIX H

GROUNDWATER LABORATORY CERTIFICATES OF ANALYSIS

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: NBC III (6412)
ESS Laboratory Work Order Number: 20C0407

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:37 pm, Mar 20, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

SAMPLE RECEIPT

The following samples were received on March 12, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
20C0407-01	MW-4	Ground Water	6010C, 6020A, 7010, 7470A, 8082A, 8100M, 8260B, 8270D, 8270D SIM
20C0407-02	MW-7	Ground Water	6010C, 6020A, 7010, 7470A, 8082A, 8100M, 8260B, 8270D, 8270D SIM

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

PROJECT NARRATIVE

8270D Semi-Volatile Organic Compounds

D0C0310-CCV2 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (125% @ 80-120%), 4,6-Dinitro-2-Methylphenol (118% @ 80-120%), Benzoic Acid (112% @ 80-120%)

D0C0310-CCV2 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (25% @ 20%), 2-Nitroaniline (25% @ 20%)

D0C0310-CCV2 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexachlorocyclopentadiene (30% @ 20%)

8270D(SIM) Semi-Volatile Organic Compounds

D0C0353-CCV1 **Calibration required quadratic regression (Q).**
Pentachlorophenol (80% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (1.0)		6020A		1	BJV	03/17/20 11:51	50	25	DC01341
Arsenic	**3.0** (2.5)		7010		1	KJK	03/17/20 19:56	50	25	DC01341
Beryllium	ND (0.5)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Cadmium	ND (2.5)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Chromium	**10.1** (10.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Copper	**13.4** (10.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Lead	ND (10.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Mercury	ND (0.20)		7470A		1	MKS	03/16/20 12:38	20	40	DC01342
Nickel	ND (25.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Selenium	ND (25.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Silver	ND (5.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341
Thallium	ND (0.5)		6020A		1	BJV	03/17/20 11:51	50	25	DC01341
Zinc	ND (25.0)		6010C		1	KJK	03/13/20 23:45	50	25	DC01341

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 3/13/20 10:03

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1221	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1232	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1242	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1248	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1254	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1260	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1262	ND (0.09)		8082A		1	03/13/20 13:47		DC01204
Aroclor 1268	ND (0.09)		8082A		1	03/13/20 13:47		DC01204

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*93 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*89 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*71 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*80 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: CAD
Prepared: 3/17/20 13:01

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (0.19)		8100M		1	03/17/20 17:33	D0C0268	DC01705

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*99 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,1,1-Trichloroethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,1,2,2-Tetrachloroethane	ND (0.0005)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,1,2-Trichloroethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,1-Dichloroethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,1-Dichloroethene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,1-Dichloropropene	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2,3-Trichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2,3-Trichloropropane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2,4-Trichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2,4-Trimethylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2-Dibromoethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2-Dichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2-Dichloroethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,2-Dichloropropane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,3,5-Trimethylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,3-Dichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,3-Dichloropropane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,4-Dichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1,4-Dioxane - Screen	ND (0.500)		8260B		1	03/12/20 17:27	D0C0232	DC01261
1-Chlorohexane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
2,2-Dichloropropane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
2-Butanone	ND (0.0100)		8260B		1	03/12/20 17:27	D0C0232	DC01261
2-Chlorotoluene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
2-Hexanone	ND (0.0100)		8260B		1	03/12/20 17:27	D0C0232	DC01261
4-Chlorotoluene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
4-Isopropyltoluene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
4-Methyl-2-Pentanone	ND (0.0250)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Acetone	ND (0.0100)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Benzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Bromobenzene	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Bromodichloromethane	ND (0.0006)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Bromoform	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Bromomethane	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Carbon Disulfide	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Carbon Tetrachloride	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Chlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Chloroethane	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Chloroform	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Chloromethane	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
cis-1,2-Dichloroethene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
cis-1,3-Dichloropropene	ND (0.0004)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Dibromochloromethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Dibromomethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Dichlorodifluoromethane	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Diethyl Ether	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Di-isopropyl ether	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Ethyl tertiary-butyl ether	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Ethylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Hexachlorobutadiene	ND (0.0006)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Hexachloroethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Isopropylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Methyl tert-Butyl Ether	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Methylene Chloride	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Naphthalene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
n-Butylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
n-Propylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
sec-Butylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Styrene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
tert-Butylbenzene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Tertiary-amyl methyl ether	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Tetrachloroethene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrahydrofuran	ND (0.0050)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Toluene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
trans-1,2-Dichloroethene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
trans-1,3-Dichloropropene	ND (0.0004)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Trichloroethene	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Trichlorofluoromethane	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Vinyl Acetate	ND (0.0050)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Vinyl Chloride	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Xylene O	ND (0.0010)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Xylene P,M	ND (0.0020)		8260B		1	03/12/20 17:27	D0C0232	DC01261
Xylenes (Total)	ND (0.00200)		8260B		1	03/12/20 17:27		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*91 %*		*70-130*
Surrogate: Dibromofluoromethane	*119 %*		*70-130*
Surrogate: Toluene-d8	*102 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: TJ
Prepared: 3/16/20 16:00

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
1,2,4-Trichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
1,2-Dichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
1,3-Dichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
1,4-Dichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,3,4,6-Tetrachlorophenol	ND (0.047)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,4,5-Trichlorophenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,4,6-Trichlorophenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,4-Dichlorophenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,4-Dimethylphenol	ND (0.047)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,4-Dinitrophenol	ND (0.047)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,4-Dinitrotoluene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2,6-Dinitrotoluene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2-Chloronaphthalene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2-Chlorophenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2-Methylphenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2-Nitroaniline	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
2-Nitrophenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
3,3´-Dichlorobenzidine	ND (0.019)		8270D		1	03/17/20 23:07	D0C0310	DC01608
3+4-Methylphenol	ND (0.019)		8270D		1	03/17/20 23:07	D0C0310	DC01608
3-Nitroaniline	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4,6-Dinitro-2-Methylphenol	ND (0.047)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4-Bromophenyl-phenylether	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4-Chloro-3-Methylphenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4-Chloroaniline	ND (0.019)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4-Chloro-phenyl-phenyl ether	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4-Nitroaniline	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
4-Nitrophenol	ND (0.047)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Acetophenone	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Aniline	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Azobenzene	ND (0.019)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Benzoic Acid	ND (0.093)		8270D		1	03/17/20 23:07	D0C0310	DC01608

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: TJ
Prepared: 3/16/20 16:00

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzyl Alcohol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
bis(2-Chloroethoxy)methane	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
bis(2-Chloroethyl)ether	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
bis(2-chloroisopropyl)Ether	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
bis(2-Ethylhexyl)phthalate	ND (0.006)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Butylbenzylphthalate	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Carbazole	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Dibenzofuran	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Diethylphthalate	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Dimethylphthalate	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Di-n-butylphthalate	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Di-n-octylphthalate	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Hexachlorobutadiene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Hexachlorocyclopentadiene	ND (0.023)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Hexachloroethane	ND (0.005)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Isophorone	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Nitrobenzene	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
N-Nitrosodimethylamine	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
N-Nitroso-Di-n-Propylamine	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
N-nitrosodiphenylamine	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Phenol	ND (0.009)		8270D		1	03/17/20 23:07	D0C0310	DC01608
Pyridine	ND (0.093)		8270D		1	03/17/20 23:07	D0C0310	DC01608

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*73 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*85 %*		*15-110*
Surrogate: 2-Chlorophenol-d4	*76 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: 2-Fluorophenol	*68 %*		*15-110*
Surrogate: Nitrobenzene-d5	*83 %*		*30-130*
Surrogate: Phenol-d6	*79 %*		*15-110*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-4
Date Sampled: 03/12/20 11:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3520C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: VSC
Prepared: 3/16/20 16:00

8270D(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Acenaphthene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Acenaphthylene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Anthracene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Benzo(a)anthracene	ND (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Benzo(a)pyrene	ND (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Benzo(b)fluoranthene	**0.00005** (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Benzo(g,h,i)perylene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Benzo(k)fluoranthene	ND (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Chrysene	ND (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Dibenzo(a,h)Anthracene	ND (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Fluoranthene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Fluorene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Hexachlorobenzene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Indeno(1,2,3-cd)Pyrene	ND (0.00005)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Naphthalene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Pentachlorophenol	ND (0.00084)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Phenanthrene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608
Pyrene	ND (0.00019)		8270D SIM		1	03/19/20 19:18	D0C0353	DC01608

%Recovery	Qualifier	Limits

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (1.0)		6020A		1	BJV	03/17/20 12:18	50	25	DC01341
Arsenic	**2.7** (2.5)		7010		1	KJK	03/17/20 20:25	50	25	DC01341
Beryllium	ND (0.5)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Cadmium	ND (2.5)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Chromium	ND (10.0)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Copper	**14.2** (10.0)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Lead	**17.5** (10.0)		6010C		1	KJK	03/17/20 15:29	50	25	DC01341
Mercury	ND (0.20)		7470A		1	MKS	03/16/20 12:41	20	40	DC01342
Nickel	ND (25.0)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Selenium	ND (25.0)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Silver	ND (5.0)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341
Thallium	ND (0.5)		6020A		1	BJV	03/17/20 12:18	50	25	DC01341
Zinc	**27.9** (25.0)		6010C		1	KJK	03/14/20 0:16	50	25	DC01341

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 3/13/20 10:03

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1221	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1232	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1242	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1248	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1254	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1260	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1262	ND (0.09)		8082A		1	03/13/20 14:06		DC01204
Aroclor 1268	ND (0.09)		8082A		1	03/13/20 14:06		DC01204

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*84 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*80 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*87 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: CAD
Prepared: 3/17/20 13:01

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (0.19)		8100M		1	03/17/20 18:06	D0C0268	DC01705

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*96 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,1,1-Trichloroethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,1,2,2-Tetrachloroethane	ND (0.0005)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,1,2-Trichloroethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,1-Dichloroethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,1-Dichloroethene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,1-Dichloropropene	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2,3-Trichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2,3-Trichloropropane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2,4-Trichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2,4-Trimethylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2-Dibromoethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2-Dichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2-Dichloroethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,2-Dichloropropane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,3,5-Trimethylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,3-Dichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,3-Dichloropropane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,4-Dichlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1,4-Dioxane - Screen	ND (0.500)		8260B		1	03/12/20 17:55	D0C0232	DC01261
1-Chlorohexane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
2,2-Dichloropropane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
2-Butanone	ND (0.0100)		8260B		1	03/12/20 17:55	D0C0232	DC01261
2-Chlorotoluene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
2-Hexanone	ND (0.0100)		8260B		1	03/12/20 17:55	D0C0232	DC01261
4-Chlorotoluene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
4-Isopropyltoluene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
4-Methyl-2-Pentanone	ND (0.0250)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Acetone	ND (0.0100)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Benzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Bromobenzene	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Bromodichloromethane	ND (0.0006)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Bromoform	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Bromomethane	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Carbon Disulfide	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Carbon Tetrachloride	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Chlorobenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Chloroethane	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Chloroform	**0.0021** (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Chloromethane	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
cis-1,2-Dichloroethene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
cis-1,3-Dichloropropene	ND (0.0004)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Dibromochloromethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Dibromomethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Dichlorodifluoromethane	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Diethyl Ether	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Di-isopropyl ether	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Ethyl tertiary-butyl ether	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Ethylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Hexachlorobutadiene	ND (0.0006)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Hexachloroethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Isopropylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Methyl tert-Butyl Ether	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Methylene Chloride	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Naphthalene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
n-Butylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
n-Propylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
sec-Butylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Styrene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
tert-Butylbenzene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Tertiary-amyl methyl ether	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Tetrachloroethene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrahydrofuran	ND (0.0050)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Toluene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
trans-1,2-Dichloroethene	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
trans-1,3-Dichloropropene	ND (0.0004)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Trichloroethene	**0.0016** (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Trichlorofluoromethane	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Vinyl Acetate	ND (0.0050)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Vinyl Chloride	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Xylene O	ND (0.0010)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Xylene P,M	ND (0.0020)		8260B		1	03/12/20 17:55	D0C0232	DC01261
Xylenes (Total)	ND (0.00200)		8260B		1	03/12/20 17:55		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*118 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*88 %*		*70-130*
Surrogate: Dibromofluoromethane	*127 %*		*70-130*
Surrogate: Toluene-d8	*114 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: TJ
Prepared: 3/16/20 16:00

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
1,2,4-Trichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
1,2-Dichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
1,3-Dichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
1,4-Dichlorobenzene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,3,4,6-Tetrachlorophenol	ND (0.047)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,4,5-Trichlorophenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,4,6-Trichlorophenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,4-Dichlorophenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,4-Dimethylphenol	ND (0.047)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,4-Dinitrophenol	ND (0.047)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,4-Dinitrotoluene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2,6-Dinitrotoluene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2-Chloronaphthalene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2-Chlorophenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2-Methylphenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2-Nitroaniline	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
2-Nitrophenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
3,3´-Dichlorobenzidine	ND (0.019)		8270D		1	03/17/20 23:34	D0C0310	DC01608
3+4-Methylphenol	ND (0.019)		8270D		1	03/17/20 23:34	D0C0310	DC01608
3-Nitroaniline	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4,6-Dinitro-2-Methylphenol	ND (0.047)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4-Bromophenyl-phenylether	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4-Chloro-3-Methylphenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4-Chloroaniline	ND (0.019)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4-Chloro-phenyl-phenyl ether	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4-Nitroaniline	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
4-Nitrophenol	ND (0.047)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Acetophenone	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Aniline	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Azobenzene	ND (0.019)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Benzoic Acid	ND (0.093)		8270D		1	03/17/20 23:34	D0C0310	DC01608

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: TJ
Prepared: 3/16/20 16:00

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzyl Alcohol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
bis(2-Chloroethoxy)methane	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
bis(2-Chloroethyl)ether	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
bis(2-chloroisopropyl)Ether	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
bis(2-Ethylhexyl)phthalate	ND (0.006)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Butylbenzylphthalate	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Carbazole	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Dibenzofuran	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Diethylphthalate	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Dimethylphthalate	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Di-n-butylphthalate	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Di-n-octylphthalate	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Hexachlorobutadiene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Hexachlorocyclopentadiene	ND (0.023)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Hexachloroethane	ND (0.005)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Isophorone	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Nitrobenzene	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
N-Nitrosodimethylamine	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
N-Nitroso-Di-n-Propylamine	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
N-nitrosodiphenylamine	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Phenol	ND (0.009)		8270D		1	03/17/20 23:34	D0C0310	DC01608
Pyridine	ND (0.093)		8270D		1	03/17/20 23:34	D0C0310	DC01608

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*75 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*84 %*		*15-110*
Surrogate: 2-Chlorophenol-d4	*67 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*80 %*		*30-130*
Surrogate: 2-Fluorophenol	*52 %*		*15-110*
Surrogate: Nitrobenzene-d5	*85 %*		*30-130*
Surrogate: Phenol-d6	*71 %*		*15-110*
Surrogate: p-Terphenyl-d14	*91 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III
Client Sample ID: MW-7
Date Sampled: 03/12/20 09:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3520C

ESS Laboratory Work Order: 20C0407
ESS Laboratory Sample ID: 20C0407-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: VSC
Prepared: 3/16/20 16:00

8270D(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Acenaphthene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Acenaphthylene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Anthracene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Benzo(a)anthracene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Benzo(a)pyrene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Benzo(b)fluoranthene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Benzo(g,h,i)perylene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Benzo(k)fluoranthene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Chrysene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Dibenzo(a,h)Anthracene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Fluoranthene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Fluorene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Hexachlorobenzene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Indeno(1,2,3-cd)Pyrene	ND (0.00005)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Naphthalene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Pentachlorophenol	ND (0.00084)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Phenanthrene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608
Pyrene	ND (0.00019)		8270D SIM		1	03/19/20 20:06	D0C0353	DC01608

%Recovery	Qualifier	Limits

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DC01341 - 3005A/200.7										
Blank										
Beryllium	ND	0.5	ug/L							
Cadmium	ND	2.5	ug/L							
Chromium	ND	10.0	ug/L							
Copper	ND	10.0	ug/L							
Lead	ND	10.0	ug/L							
Nickel	ND	25.0	ug/L							
Selenium	ND	25.0	ug/L							
Silver	ND	5.0	ug/L							
Zinc	ND	25.0	ug/L							
Blank										
Antimony	ND	1.0	ug/L							
Thallium	ND	0.5	ug/L							
Blank										
Arsenic	ND	2.5	ug/L							
LCS										
Beryllium	22.4	0.5	ug/L	25.00		89	80-120			
Cadmium	112	2.5	ug/L	125.0		90	80-120			
Chromium	223	10.0	ug/L	250.0		89	80-120			
Copper	233	10.0	ug/L	250.0		93	80-120			
Lead	231	10.0	ug/L	250.0		92	80-120			
Nickel	225	25.0	ug/L	250.0		90	80-120			
Selenium	452	25.0	ug/L	500.0		90	80-120			
Silver	117	5.0	ug/L	125.0		94	80-120			
Zinc	222	25.0	ug/L	250.0		89	80-120			
LCS										
Antimony	276	5.0	ug/L	250.0		110	80-120			
Thallium	277	2.5	ug/L	250.0		111	80-120			
LCS										
Arsenic	212	62.5	ug/L	250.0		85	80-120			
LCS Dup										
Beryllium	22.4	0.5	ug/L	25.00		90	80-120	0.07	20	
Cadmium	110	2.5	ug/L	125.0		88	80-120	2	20	
Chromium	225	10.0	ug/L	250.0		90	80-120	1	20	
Copper	234	10.0	ug/L	250.0		93	80-120	0.2	20	
Lead	228	10.0	ug/L	250.0		91	80-120	2	20	
Nickel	226	25.0	ug/L	250.0		90	80-120	0.6	20	
Selenium	446	25.0	ug/L	500.0		89	80-120	1	20	
Silver	117	5.0	ug/L	125.0		94	80-120	0.01	20	
Zinc	222	25.0	ug/L	250.0		89	80-120	0.009	20	
LCS Dup										
Antimony	273	5.0	ug/L	250.0		109	80-120	1	20	
Thallium	273	2.5	ug/L	250.0		109	80-120	1	20	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DC01341 - 3005A/200.7										
LCS Dup										
Arsenic	214	62.5	ug/L	250.0		85	80-120	0.9	20	
Batch DC01342 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.60	0.20	ug/L	6.042		93	80-120			
LCS Dup										
Mercury	5.46	0.20	ug/L	6.042		90	80-120	3	20	
8082A Polychlorinated Biphenyls (PCB)										
Batch DC01204 - 3510C										
Blank										
Aroclor 1016	ND	0.05	ug/L							
Aroclor 1016 [2C]	ND	0.05	ug/L							
Aroclor 1221	ND	0.05	ug/L							
Aroclor 1221 [2C]	ND	0.05	ug/L							
Aroclor 1232	ND	0.05	ug/L							
Aroclor 1232 [2C]	ND	0.05	ug/L							
Aroclor 1242	ND	0.05	ug/L							
Aroclor 1242 [2C]	ND	0.05	ug/L							
Aroclor 1248	ND	0.05	ug/L							
Aroclor 1248 [2C]	ND	0.05	ug/L							
Aroclor 1254	ND	0.05	ug/L							
Aroclor 1254 [2C]	ND	0.05	ug/L							
Aroclor 1260	ND	0.05	ug/L							
Aroclor 1260 [2C]	ND	0.05	ug/L							
Aroclor 1262	ND	0.05	ug/L							
Aroclor 1262 [2C]	ND	0.05	ug/L							
Aroclor 1268	ND	0.05	ug/L							
Aroclor 1268 [2C]	ND	0.05	ug/L							
Surrogate: Decachlorobiphenyl	*0.0508*		ug/L	*0.05000*		*102*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0515*		ug/L	*0.05000*		*103*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0306*		ug/L	*0.05000*		*61*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0340*		ug/L	*0.05000*		*68*	*30-150*			
LCS										
Aroclor 1016	0.73	0.05	ug/L	1.000		73	40-140			
Aroclor 1016 [2C]	0.78	0.05	ug/L	1.000		78	40-140			
Aroclor 1260	0.87	0.05	ug/L	1.000		87	40-140			
Aroclor 1260 [2C]	0.91	0.05	ug/L	1.000		91	40-140			
Surrogate: Decachlorobiphenyl	*0.0538*		ug/L	*0.05000*		*108*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0543*		ug/L	*0.05000*		*109*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch DC01204 - 3510C										
Surrogate: Tetrachloro-m-xylene	*0.0318*		ug/L	*0.05000*		*64*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0347*		ug/L	*0.05000*		*69*	*30-150*			
LCS Dup										
Aroclor 1016	0.73	0.05	ug/L	1.000		73	40-140	0.6	20	
Aroclor 1016 [2C]	0.81	0.05	ug/L	1.000		81	40-140	3	20	
Aroclor 1260	0.85	0.05	ug/L	1.000		85	40-140	3	20	
Aroclor 1260 [2C]	0.90	0.05	ug/L	1.000		90	40-140	1	20	
Surrogate: Decachlorobiphenyl	*0.0541*		ug/L	*0.05000*		*108*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0542*		ug/L	*0.05000*		*108*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0305*		ug/L	*0.05000*		*61*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0360*		ug/L	*0.05000*		*72*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch DC01705 - 3510C										
Blank										
Decane (C10)	ND	0.005	mg/L							
Docosane (C22)	ND	0.005	mg/L							
Dodecane (C12)	ND	0.005	mg/L							
Eicosane (C20)	ND	0.005	mg/L							
Hexacosane (C26)	ND	0.005	mg/L							
Hexadecane (C16)	ND	0.005	mg/L							
Nonadecane (C19)	ND	0.005	mg/L							
Nonane (C9)	ND	0.005	mg/L							
Octacosane (C28)	ND	0.005	mg/L							
Octadecane (C18)	ND	0.005	mg/L							
Tetracosane (C24)	ND	0.005	mg/L							
Tetradecane (C14)	ND	0.005	mg/L							
Total Petroleum Hydrocarbons	ND	0.20	mg/L							
Triacontane (C30)	ND	0.005	mg/L							
Surrogate: O-Terphenyl	*0.0980*		mg/L	*0.1000*		*98*	*40-140*			
LCS										
Decane (C10)	0.041	0.005	mg/L	0.05000		81	40-140			
Docosane (C22)	0.048	0.005	mg/L	0.05000		96	40-140			
Dodecane (C12)	0.045	0.005	mg/L	0.05000		90	40-140			
Eicosane (C20)	0.048	0.005	mg/L	0.05000		95	40-140			
Hexacosane (C26)	0.048	0.005	mg/L	0.05000		96	40-140			
Hexadecane (C16)	0.047	0.005	mg/L	0.05000		94	40-140			
Nonadecane (C19)	0.048	0.005	mg/L	0.05000		95	40-140			
Nonane (C9)	0.036	0.005	mg/L	0.05000		71	30-140			
Octacosane (C28)	0.049	0.005	mg/L	0.05000		97	40-140			
Octadecane (C18)	0.047	0.005	mg/L	0.05000		94	40-140			
Tetracosane (C24)	0.048	0.005	mg/L	0.05000		96	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch DC01705 - 3510C										
Tetradecane (C14)	0.047	0.005	mg/L	0.05000		93	40-140			
Total Petroleum Hydrocarbons	0.641	0.20	mg/L	0.7000		92	40-140			
Triacontane (C30)	0.047	0.005	mg/L	0.05000		95	40-140			
Surrogate: O-Terphenyl	*0.100*		mg/L	*0.1000*		*100*	*40-140*			
LCS Dup										
Decane (C10)	0.041	0.005	mg/L	0.05000		81	40-140	0.2	25	
Docosane (C22)	0.047	0.005	mg/L	0.05000		94	40-140	1	25	
Dodecane (C12)	0.045	0.005	mg/L	0.05000		90	40-140	0.6	25	
Eicosane (C20)	0.047	0.005	mg/L	0.05000		94	40-140	2	25	
Hexacosane (C26)	0.047	0.005	mg/L	0.05000		94	40-140	2	25	
Hexadecane (C16)	0.046	0.005	mg/L	0.05000		92	40-140	1	25	
Nonadecane (C19)	0.047	0.005	mg/L	0.05000		94	40-140	2	25	
Nonane (C9)	0.036	0.005	mg/L	0.05000		72	30-140	1	25	
Octacosane (C28)	0.048	0.005	mg/L	0.05000		96	40-140	2	25	
Octadecane (C18)	0.046	0.005	mg/L	0.05000		93	40-140	1	25	
Tetracosane (C24)	0.047	0.005	mg/L	0.05000		94	40-140	1	25	
Tetradecane (C14)	0.046	0.005	mg/L	0.05000		92	40-140	2	25	
Total Petroleum Hydrocarbons	0.634	0.20	mg/L	0.7000		91	40-140	1	25	
Triacontane (C30)	0.047	0.005	mg/L	0.05000		94	40-140	1	25	
Surrogate: O-Terphenyl	*0.0971*		mg/L	*0.1000*		*97*	*40-140*			
8260B Volatile Organic Compounds										
Batch DC01261 - 5030B										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0010	mg/L							
1,1,1-Trichloroethane	ND	0.0010	mg/L							
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L							
1,1,2-Trichloroethane	ND	0.0010	mg/L							
1,1-Dichloroethane	ND	0.0010	mg/L							
1,1-Dichloroethene	ND	0.0010	mg/L							
1,1-Dichloropropene	ND	0.0020	mg/L							
1,2,3-Trichlorobenzene	ND	0.0010	mg/L							
1,2,3-Trichloropropane	ND	0.0010	mg/L							
1,2,4-Trichlorobenzene	ND	0.0010	mg/L							
1,2,4-Trimethylbenzene	ND	0.0010	mg/L							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/L							
1,2-Dibromoethane	ND	0.0010	mg/L							
1,2-Dichlorobenzene	ND	0.0010	mg/L							
1,2-Dichloroethane	ND	0.0010	mg/L							
1,2-Dichloropropane	ND	0.0010	mg/L							
1,3,5-Trimethylbenzene	ND	0.0010	mg/L							
1,3-Dichlorobenzene	ND	0.0010	mg/L							
1,3-Dichloropropane	ND	0.0010	mg/L							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch DC01261 - 5030B										
1,4-Dichlorobenzene	ND	0.0010	mg/L							
1,4-Dioxane - Screen	ND	0.500	mg/L							
1-Chlorohexane	ND	0.0010	mg/L							
2,2-Dichloropropane	ND	0.0010	mg/L							
2-Butanone	ND	0.0100	mg/L							
2-Chlorotoluene	ND	0.0010	mg/L							
2-Hexanone	ND	0.0100	mg/L							
4-Chlorotoluene	ND	0.0010	mg/L							
4-Isopropyltoluene	ND	0.0010	mg/L							
4-Methyl-2-Pentanone	ND	0.0250	mg/L							
Acetone	ND	0.0100	mg/L							
Benzene	ND	0.0010	mg/L							
Bromobenzene	ND	0.0020	mg/L							
Bromochloromethane	ND	0.0010	mg/L							
Bromodichloromethane	ND	0.0006	mg/L							
Bromoform	ND	0.0010	mg/L							
Bromomethane	ND	0.0020	mg/L							
Carbon Disulfide	ND	0.0010	mg/L							
Carbon Tetrachloride	ND	0.0010	mg/L							
Chlorobenzene	ND	0.0010	mg/L							
Chloroethane	ND	0.0020	mg/L							
Chloroform	ND	0.0010	mg/L							
Chloromethane	ND	0.0020	mg/L							
cis-1,2-Dichloroethene	ND	0.0010	mg/L							
cis-1,3-Dichloropropene	ND	0.0004	mg/L							
Dibromochloromethane	ND	0.0010	mg/L							
Dibromomethane	ND	0.0010	mg/L							
Dichlorodifluoromethane	ND	0.0020	mg/L							
Diethyl Ether	ND	0.0010	mg/L							
Di-isopropyl ether	ND	0.0010	mg/L							
Ethyl tertiary-butyl ether	ND	0.0010	mg/L							
Ethylbenzene	ND	0.0010	mg/L							
Hexachlorobutadiene	ND	0.0006	mg/L							
Hexachloroethane	ND	0.0010	mg/L							
Isopropylbenzene	ND	0.0010	mg/L							
Methyl tert-Butyl Ether	ND	0.0010	mg/L							
Methylene Chloride	ND	0.0020	mg/L							
Naphthalene	ND	0.0010	mg/L							
n-Butylbenzene	ND	0.0010	mg/L							
n-Propylbenzene	ND	0.0010	mg/L							
sec-Butylbenzene	ND	0.0010	mg/L							
Styrene	ND	0.0010	mg/L							
tert-Butylbenzene	ND	0.0010	mg/L							
Tertiary-amyl methyl ether	ND	0.0010	mg/L							
Tetrachloroethene	ND	0.0010	mg/L							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch DC01261 - 5030B										
Tetrahydrofuran	ND	0.0050	mg/L							
Toluene	ND	0.0010	mg/L							
trans-1,2-Dichloroethene	ND	0.0010	mg/L							
trans-1,3-Dichloropropene	ND	0.0004	mg/L							
Trichloroethene	ND	0.0010	mg/L							
Trichlorofluoromethane	ND	0.0010	mg/L							
Vinyl Acetate	ND	0.0050	mg/L							
Vinyl Chloride	ND	0.0010	mg/L							
Xylene O	ND	0.0010	mg/L							
Xylene P,M	ND	0.0020	mg/L							
Surrogate: 1,2-Dichloroethane-d4	*0.0273*		mg/L	*0.02500*		*109*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0235*		mg/L	*0.02500*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0286*		mg/L	*0.02500*		*114*	*70-130*			
Surrogate: Toluene-d8	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0085	0.0010	mg/L	0.01000		85	70-130			
1,1,1-Trichloroethane	0.0100	0.0010	mg/L	0.01000		100	70-130			
1,1,2,2-Tetrachloroethane	0.0114	0.0005	mg/L	0.01000		114	70-130			
1,1,2-Trichloroethane	0.0120	0.0010	mg/L	0.01000		120	70-130			
1,1-Dichloroethane	0.0109	0.0010	mg/L	0.01000		109	70-130			
1,1-Dichloroethene	0.0116	0.0010	mg/L	0.01000		116	70-130			
1,1-Dichloropropene	0.0110	0.0020	mg/L	0.01000		110	70-130			
1,2,3-Trichlorobenzene	0.0088	0.0010	mg/L	0.01000		88	70-130			
1,2,3-Trichloropropane	0.0099	0.0010	mg/L	0.01000		99	70-130			
1,2,4-Trichlorobenzene	0.0081	0.0010	mg/L	0.01000		81	70-130			
1,2,4-Trimethylbenzene	0.0101	0.0010	mg/L	0.01000		101	70-130			
1,2-Dibromo-3-Chloropropane	0.0093	0.0050	mg/L	0.01000		93	70-130			
1,2-Dibromoethane	0.0101	0.0010	mg/L	0.01000		101	70-130			
1,2-Dichlorobenzene	0.0092	0.0010	mg/L	0.01000		92	70-130			
1,2-Dichloroethane	0.0106	0.0010	mg/L	0.01000		106	70-130			
1,2-Dichloropropane	0.0123	0.0010	mg/L	0.01000		123	70-130			
1,3,5-Trimethylbenzene	0.0092	0.0010	mg/L	0.01000		92	70-130			
1,3-Dichlorobenzene	0.0095	0.0010	mg/L	0.01000		95	70-130			
1,3-Dichloropropane	0.0103	0.0010	mg/L	0.01000		103	70-130			
1,4-Dichlorobenzene	0.0100	0.0010	mg/L	0.01000		100	70-130			
1,4-Dioxane - Screen	0.220	0.500	mg/L	0.2000		110	0-332			
1-Chlorohexane	0.0091	0.0010	mg/L	0.01000		91	70-130			
2,2-Dichloropropane	0.0104	0.0010	mg/L	0.01000		104	70-130			
2-Butanone	0.0581	0.0100	mg/L	0.05000		116	70-130			
2-Chlorotoluene	0.0098	0.0010	mg/L	0.01000		98	70-130			
2-Hexanone	0.0488	0.0100	mg/L	0.05000		98	70-130			
4-Chlorotoluene	0.0097	0.0010	mg/L	0.01000		97	70-130			
4-Isopropyltoluene	0.0092	0.0010	mg/L	0.01000		92	70-130			
4-Methyl-2-Pentanone	0.0642	0.0250	mg/L	0.05000		128	70-130			
Acetone	0.0495	0.0100	mg/L	0.05000		99	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch DC01261 - 5030B										
Benzene	0.0116	0.0010	mg/L	0.01000		116	70-130			
Bromobenzene	0.0090	0.0020	mg/L	0.01000		90	70-130			
Bromochloromethane	0.0112	0.0010	mg/L	0.01000		112	70-130			
Bromodichloromethane	0.0108	0.0006	mg/L	0.01000		108	70-130			
Bromoform	0.0072	0.0010	mg/L	0.01000		72	70-130			
Bromomethane	0.0114	0.0020	mg/L	0.01000		114	70-130			
Carbon Disulfide	0.0119	0.0010	mg/L	0.01000		119	70-130			
Carbon Tetrachloride	0.0101	0.0010	mg/L	0.01000		101	70-130			
Chlorobenzene	0.0091	0.0010	mg/L	0.01000		91	70-130			
Chloroethane	0.0093	0.0020	mg/L	0.01000		93	70-130			
Chloroform	0.0106	0.0010	mg/L	0.01000		106	70-130			
Chloromethane	0.0108	0.0020	mg/L	0.01000		108	70-130			
cis-1,2-Dichloroethene	0.0114	0.0010	mg/L	0.01000		114	70-130			
cis-1,3-Dichloropropene	0.0118	0.0004	mg/L	0.01000		118	70-130			
Dibromochloromethane	0.0082	0.0010	mg/L	0.01000		82	70-130			
Dibromomethane	0.0113	0.0010	mg/L	0.01000		113	70-130			
Dichlorodifluoromethane	0.0090	0.0020	mg/L	0.01000		91	70-130			
Diethyl Ether	0.0115	0.0010	mg/L	0.01000		115	70-130			
Di-isopropyl ether	0.0117	0.0010	mg/L	0.01000		117	70-130			
Ethyl tertiary-butyl ether	0.0111	0.0010	mg/L	0.01000		111	70-130			
Ethylbenzene	0.0087	0.0010	mg/L	0.01000		87	70-130			
Hexachlorobutadiene	0.0096	0.0006	mg/L	0.01000		96	70-130			
Hexachloroethane	0.0095	0.0010	mg/L	0.01000		95	70-130			
Isopropylbenzene	0.0099	0.0010	mg/L	0.01000		99	70-130			
Methyl tert-Butyl Ether	0.0109	0.0010	mg/L	0.01000		109	70-130			
Methylene Chloride	0.0112	0.0020	mg/L	0.01000		112	70-130			
Naphthalene	0.0097	0.0010	mg/L	0.01000		97	70-130			
n-Butylbenzene	0.0102	0.0010	mg/L	0.01000		102	70-130			
n-Propylbenzene	0.0100	0.0010	mg/L	0.01000		100	70-130			
sec-Butylbenzene	0.0095	0.0010	mg/L	0.01000		95	70-130			
Styrene	0.0087	0.0010	mg/L	0.01000		87	70-130			
tert-Butylbenzene	0.0097	0.0010	mg/L	0.01000		97	70-130			
Tertiary-amyl methyl ether	0.0105	0.0010	mg/L	0.01000		105	70-130			
Tetrachloroethene	0.0072	0.0010	mg/L	0.01000		72	70-130			
Tetrahydrofuran	0.0123	0.0050	mg/L	0.01000		123	70-130			
Toluene	0.0105	0.0010	mg/L	0.01000		105	70-130			
trans-1,2-Dichloroethene	0.0108	0.0010	mg/L	0.01000		108	70-130			
trans-1,3-Dichloropropene	0.0099	0.0004	mg/L	0.01000		99	70-130			
Trichloroethene	0.0105	0.0010	mg/L	0.01000		105	70-130			
Trichlorofluoromethane	0.0103	0.0010	mg/L	0.01000		103	70-130			
Vinyl Acetate	0.0109	0.0050	mg/L	0.01000		109	70-130			
Vinyl Chloride	0.0095	0.0010	mg/L	0.01000		95	70-130			
Xylene O	0.0096	0.0010	mg/L	0.01000		96	70-130			
Xylene P,M	0.0179	0.0020	mg/L	0.02000		89	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0283*		mg/L	*0.02500*		*113*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch DC01261 - 5030B										
Surrogate: 4-Bromofluorobenzene	*0.0226*		mg/L	*0.02500*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0297*		mg/L	*0.02500*		*119*	*70-130*			
Surrogate: Toluene-d8	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0086	0.0010	mg/L	0.01000		86	70-130	1	25	
1,1,1-Trichloroethane	0.0100	0.0010	mg/L	0.01000		100	70-130	0.2	25	
1,1,2,2-Tetrachloroethane	0.0111	0.0005	mg/L	0.01000		111	70-130	2	25	
1,1,2-Trichloroethane	0.0111	0.0010	mg/L	0.01000		111	70-130	7	25	
1,1-Dichloroethane	0.0107	0.0010	mg/L	0.01000		107	70-130	2	25	
1,1-Dichloroethene	0.0107	0.0010	mg/L	0.01000		107	70-130	8	25	
1,1-Dichloropropene	0.0106	0.0020	mg/L	0.01000		106	70-130	3	25	
1,2,3-Trichlorobenzene	0.0083	0.0010	mg/L	0.01000		83	70-130	6	25	
1,2,3-Trichloropropane	0.0100	0.0010	mg/L	0.01000		100	70-130	0.7	25	
1,2,4-Trichlorobenzene	0.0076	0.0010	mg/L	0.01000		76	70-130	7	25	
1,2,4-Trimethylbenzene	0.0098	0.0010	mg/L	0.01000		98	70-130	3	25	
1,2-Dibromo-3-Chloropropane	0.0084	0.0050	mg/L	0.01000		84	70-130	11	25	
1,2-Dibromoethane	0.0094	0.0010	mg/L	0.01000		94	70-130	7	25	
1,2-Dichlorobenzene	0.0095	0.0010	mg/L	0.01000		95	70-130	3	25	
1,2-Dichloroethane	0.0101	0.0010	mg/L	0.01000		101	70-130	5	25	
1,2-Dichloropropane	0.0118	0.0010	mg/L	0.01000		118	70-130	4	25	
1,3,5-Trimethylbenzene	0.0097	0.0010	mg/L	0.01000		97	70-130	5	25	
1,3-Dichlorobenzene	0.0091	0.0010	mg/L	0.01000		91	70-130	4	25	
1,3-Dichloropropane	0.0099	0.0010	mg/L	0.01000		99	70-130	4	25	
1,4-Dichlorobenzene	0.0097	0.0010	mg/L	0.01000		97	70-130	2	25	
1,4-Dioxane - Screen	0.226	0.500	mg/L	0.2000		113	0-332	2	200	
1-Chlorohexane	0.0087	0.0010	mg/L	0.01000		87	70-130	4	25	
2,2-Dichloropropane	0.0096	0.0010	mg/L	0.01000		96	70-130	8	25	
2-Butanone	0.0621	0.0100	mg/L	0.05000		124	70-130	7	25	
2-Chlorotoluene	0.0099	0.0010	mg/L	0.01000		99	70-130	1	25	
2-Hexanone	0.0507	0.0100	mg/L	0.05000		101	70-130	4	25	
4-Chlorotoluene	0.0094	0.0010	mg/L	0.01000		94	70-130	4	25	
4-Isopropyltoluene	0.0094	0.0010	mg/L	0.01000		94	70-130	2	25	
4-Methyl-2-Pentanone	0.0589	0.0250	mg/L	0.05000		118	70-130	8	25	
Acetone	0.0559	0.0100	mg/L	0.05000		112	70-130	12	25	
Benzene	0.0113	0.0010	mg/L	0.01000		113	70-130	3	25	
Bromobenzene	0.0090	0.0020	mg/L	0.01000		90	70-130	0.4	25	
Bromochloromethane	0.0108	0.0010	mg/L	0.01000		108	70-130	3	25	
Bromodichloromethane	0.0109	0.0006	mg/L	0.01000		109	70-130	1	25	
Bromoform	0.0072	0.0010	mg/L	0.01000		72	70-130	0.8	25	
Bromomethane	0.0117	0.0020	mg/L	0.01000		117	70-130	3	25	
Carbon Disulfide	0.0114	0.0010	mg/L	0.01000		114	70-130	4	25	
Carbon Tetrachloride	0.0102	0.0010	mg/L	0.01000		102	70-130	0.6	25	
Chlorobenzene	0.0090	0.0010	mg/L	0.01000		90	70-130	0.8	25	
Chloroethane	0.0092	0.0020	mg/L	0.01000		92	70-130	0.8	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch DC01261 - 5030B										
Chloroform	0.0103	0.0010	mg/L	0.01000		103	70-130	3	25	
Chloromethane	0.0095	0.0020	mg/L	0.01000		95	70-130	12	25	
cis-1,2-Dichloroethene	0.0105	0.0010	mg/L	0.01000		105	70-130	8	25	
cis-1,3-Dichloropropene	0.0112	0.0004	mg/L	0.01000		112	70-130	5	25	
Dibromochloromethane	0.0080	0.0010	mg/L	0.01000		80	70-130	3	25	
Dibromomethane	0.0108	0.0010	mg/L	0.01000		108	70-130	5	25	
Dichlorodifluoromethane	0.0087	0.0020	mg/L	0.01000		87	70-130	4	25	
Diethyl Ether	0.0115	0.0010	mg/L	0.01000		115	70-130	0.4	25	
Di-isopropyl ether	0.0118	0.0010	mg/L	0.01000		118	70-130	0.6	25	
Ethyl tertiary-butyl ether	0.0102	0.0010	mg/L	0.01000		102	70-130	9	25	
Ethylbenzene	0.0086	0.0010	mg/L	0.01000		86	70-130	1	25	
Hexachlorobutadiene	0.0094	0.0006	mg/L	0.01000		94	70-130	2	25	
Hexachloroethane	0.0093	0.0010	mg/L	0.01000		93	70-130	3	25	
Isopropylbenzene	0.0100	0.0010	mg/L	0.01000		100	70-130	2	25	
Methyl tert-Butyl Ether	0.0105	0.0010	mg/L	0.01000		105	70-130	3	25	
Methylene Chloride	0.0109	0.0020	mg/L	0.01000		109	70-130	3	25	
Naphthalene	0.0090	0.0010	mg/L	0.01000		90	70-130	7	25	
n-Butylbenzene	0.0102	0.0010	mg/L	0.01000		102	70-130	0.1	25	
n-Propylbenzene	0.0098	0.0010	mg/L	0.01000		98	70-130	2	25	
sec-Butylbenzene	0.0096	0.0010	mg/L	0.01000		97	70-130	2	25	
Styrene	0.0086	0.0010	mg/L	0.01000		86	70-130	1	25	
tert-Butylbenzene	0.0095	0.0010	mg/L	0.01000		95	70-130	2	25	
Tertiary-amyl methyl ether	0.0103	0.0010	mg/L	0.01000		103	70-130	2	25	
Tetrachloroethene	0.0072	0.0010	mg/L	0.01000		72	70-130	0.3	25	
Tetrahydrofuran	0.0112	0.0050	mg/L	0.01000		112	70-130	9	25	
Toluene	0.0099	0.0010	mg/L	0.01000		99	70-130	6	25	
trans-1,2-Dichloroethene	0.0108	0.0010	mg/L	0.01000		108	70-130	0.6	25	
trans-1,3-Dichloropropene	0.0095	0.0004	mg/L	0.01000		95	70-130	4	25	
Trichloroethene	0.0110	0.0010	mg/L	0.01000		110	70-130	4	25	
Trichlorofluoromethane	0.0100	0.0010	mg/L	0.01000		100	70-130	3	25	
Vinyl Acetate	0.0106	0.0050	mg/L	0.01000		106	70-130	3	25	
Vinyl Chloride	0.0089	0.0010	mg/L	0.01000		89	70-130	6	25	
Xylene O	0.0091	0.0010	mg/L	0.01000		91	70-130	5	25	
Xylene P,M	0.0184	0.0020	mg/L	0.02000		92	70-130	3	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0276*		mg/L	*0.02500*		*111*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0239*		mg/L	*0.02500*		*95*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0278*		mg/L	*0.02500*		*111*	*70-130*			
Surrogate: Toluene-d8	*0.0245*		mg/L	*0.02500*		*98*	*70-130*			
8270D Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
Blank										
1,1-Biphenyl	ND	0.010	mg/L							
1,2,4-Trichlorobenzene	ND	0.010	mg/L							
1,2-Dichlorobenzene	ND	0.010	mg/L							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
1,3-Dichlorobenzene	ND	0.010	mg/L							
1,4-Dichlorobenzene	ND	0.010	mg/L							
2,3,4,6-Tetrachlorophenol	ND	0.050	mg/L							
2,4,5-Trichlorophenol	ND	0.010	mg/L							
2,4,6-Trichlorophenol	ND	0.010	mg/L							
2,4-Dichlorophenol	ND	0.010	mg/L							
2,4-Dimethylphenol	ND	0.050	mg/L							
2,4-Dinitrophenol	ND	0.050	mg/L							
2,4-Dinitrotoluene	ND	0.010	mg/L							
2,6-Dinitrotoluene	ND	0.010	mg/L							
2-Chloronaphthalene	ND	0.010	mg/L							
2-Chlorophenol	ND	0.010	mg/L							
2-Methylphenol	ND	0.010	mg/L							
2-Nitroaniline	ND	0.010	mg/L							
2-Nitrophenol	ND	0.010	mg/L							
3,3´-Dichlorobenzidine	ND	0.020	mg/L							
3+4-Methylphenol	ND	0.020	mg/L							
3-Nitroaniline	ND	0.010	mg/L							
4,6-Dinitro-2-Methylphenol	ND	0.050	mg/L							
4-Bromophenyl-phenylether	ND	0.010	mg/L							
4-Chloro-3-Methylphenol	ND	0.010	mg/L							
4-Chloroaniline	ND	0.020	mg/L							
4-Chloro-phenyl-phenyl ether	ND	0.010	mg/L							
4-Nitroaniline	ND	0.010	mg/L							
4-Nitrophenol	ND	0.050	mg/L							
Acetophenone	ND	0.010	mg/L							
Aniline	ND	0.010	mg/L							
Azobenzene	ND	0.020	mg/L							
Benzoic Acid	ND	0.100	mg/L							
Benzyl Alcohol	ND	0.010	mg/L							
bis(2-Chloroethoxy)methane	ND	0.010	mg/L							
bis(2-Chloroethyl)ether	ND	0.010	mg/L							
bis(2-chloroisopropyl)Ether	ND	0.010	mg/L							
bis(2-Ethylhexyl)phthalate	ND	0.006	mg/L							
Butylbenzylphthalate	ND	0.010	mg/L							
Carbazole	ND	0.010	mg/L							
Dibenzofuran	ND	0.010	mg/L							
Diethylphthalate	ND	0.010	mg/L							
Dimethylphthalate	ND	0.010	mg/L							
Di-n-butylphthalate	ND	0.010	mg/L							
Di-n-octylphthalate	ND	0.010	mg/L							
Hexachlorobutadiene	ND	0.010	mg/L							
Hexachlorocyclopentadiene	ND	0.025	mg/L							
Hexachloroethane	ND	0.005	mg/L							
Isophorone	ND	0.010	mg/L							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
Nitrobenzene	ND	0.010	mg/L							
N-Nitrosodimethylamine	ND	0.010	mg/L							
N-Nitroso-Di-n-Propylamine	ND	0.010	mg/L							
N-nitrosodiphenylamine	ND	0.010	mg/L							
Phenol	ND	0.010	mg/L							
Pyridine	ND	0.100	mg/L							
Surrogate: 1,2-Dichlorobenzene-d4	*0.0572*		mg/L	*0.1000*		*57*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*0.0934*		mg/L	*0.1500*		*62*	*15-110*			
Surrogate: 2-Chlorophenol-d4	*0.0859*		mg/L	*0.1500*		*57*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*0.0576*		mg/L	*0.1000*		*58*	*30-130*			
Surrogate: 2-Fluorophenol	*0.0682*		mg/L	*0.1500*		*45*	*15-110*			
Surrogate: Nitrobenzene-d5	*0.0653*		mg/L	*0.1000*		*65*	*30-130*			
Surrogate: Phenol-d6	*0.0834*		mg/L	*0.1500*		*56*	*15-110*			
Surrogate: p-Terphenyl-d14	*0.0662*		mg/L	*0.1000*		*66*	*30-130*			
LCS										
1,1-Biphenyl	0.088	0.010	mg/L	0.1000		88	40-140			
1,2,4-Trichlorobenzene	0.081	0.010	mg/L	0.1000		81	40-140			
1,2-Dichlorobenzene	0.080	0.010	mg/L	0.1000		80	40-140			
1,3-Dichlorobenzene	0.078	0.010	mg/L	0.1000		78	40-140			
1,4-Dichlorobenzene	0.079	0.010	mg/L	0.1000		79	40-140			
2,3,4,6-Tetrachlorophenol	0.086	0.050	mg/L	0.1000		86	40-140			
2,4,5-Trichlorophenol	0.092	0.010	mg/L	0.1000		92	30-130			
2,4,6-Trichlorophenol	0.088	0.010	mg/L	0.1000		88	30-130			
2,4-Dichlorophenol	0.083	0.010	mg/L	0.1000		83	30-130			
2,4-Dimethylphenol	0.076	0.050	mg/L	0.1000		76	30-130			
2,4-Dinitrophenol	0.107	0.050	mg/L	0.1000		107	30-130			
2,4-Dinitrotoluene	0.103	0.010	mg/L	0.1000		103	40-140			
2,6-Dinitrotoluene	0.092	0.010	mg/L	0.1000		92	40-140			
2-Chloronaphthalene	0.084	0.010	mg/L	0.1000		84	40-140			
2-Chlorophenol	0.076	0.010	mg/L	0.1000		76	30-130			
2-Methylphenol	0.079	0.010	mg/L	0.1000		79	30-130			
2-Nitroaniline	0.114	0.010	mg/L	0.1000		114	40-140			
2-Nitrophenol	0.084	0.010	mg/L	0.1000		84	30-130			
3,3´-Dichlorobenzidine	0.090	0.020	mg/L	0.1000		90	40-140			
3+4-Methylphenol	0.167	0.020	mg/L	0.2000		83	30-130			
3-Nitroaniline	0.097	0.010	mg/L	0.1000		97	40-140			
4,6-Dinitro-2-Methylphenol	0.110	0.050	mg/L	0.1000		110	30-130			
4-Bromophenyl-phenylether	0.091	0.010	mg/L	0.1000		91	40-140			
4-Chloro-3-Methylphenol	0.092	0.010	mg/L	0.1000		92	30-130			
4-Chloroaniline	0.064	0.020	mg/L	0.1000		64	40-140			
4-Chloro-phenyl-phenyl ether	0.089	0.010	mg/L	0.1000		89	40-140			
4-Nitroaniline	0.102	0.010	mg/L	0.1000		102	40-140			
4-Nitrophenol	0.104	0.050	mg/L	0.1000		104	30-130			
Acetophenone	0.083	0.010	mg/L	0.1000		83	40-140			
Aniline	0.079	0.010	mg/L	0.1000		79	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
Azobenzene	0.102	0.020	mg/L	0.1000		102	40-140			
Benzoic Acid	0.084	0.100	mg/L	0.1000		84	40-140			
Benzyl Alcohol	0.086	0.010	mg/L	0.1000		86	40-140			
bis(2-Chloroethoxy)methane	0.089	0.010	mg/L	0.1000		89	40-140			
bis(2-Chloroethyl)ether	0.088	0.010	mg/L	0.1000		88	40-140			
bis(2-chloroisopropyl)Ether	0.082	0.010	mg/L	0.1000		82	40-140			
bis(2-Ethylhexyl)phthalate	0.115	0.006	mg/L	0.1000		115	40-140			
Butylbenzylphthalate	0.112	0.010	mg/L	0.1000		112	40-140			
Carbazole	0.099	0.010	mg/L	0.1000		99	40-140			
Dibenzofuran	0.088	0.010	mg/L	0.1000		88	40-140			
Diethylphthalate	0.094	0.010	mg/L	0.1000		94	40-140			
Dimethylphthalate	0.094	0.010	mg/L	0.1000		94	40-140			
Di-n-butylphthalate	0.103	0.010	mg/L	0.1000		103	40-140			
Di-n-octylphthalate	0.107	0.010	mg/L	0.1000		107	40-140			
Hexachlorobutadiene	0.081	0.010	mg/L	0.1000		81	40-140			
Hexachlorocyclopentadiene	0.053	0.025	mg/L	0.1000		53	40-140			
Hexachloroethane	0.081	0.005	mg/L	0.1000		81	40-140			
Isophorone	0.077	0.010	mg/L	0.1000		77	40-140			
Nitrobenzene	0.089	0.010	mg/L	0.1000		89	40-140			
N-Nitrosodimethylamine	0.085	0.010	mg/L	0.1000		85	40-140			
N-Nitroso-Di-n-Propylamine	0.090	0.010	mg/L	0.1000		90	40-140			
N-nitrosodiphenylamine	0.087	0.010	mg/L	0.1000		87	40-140			
Phenol	0.087	0.010	mg/L	0.1000		87	30-130			
Pyridine	0.073	0.100	mg/L	0.1000		73	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*0.0841*		mg/L	*0.1000*		*84*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*0.147*		mg/L	*0.1500*		*98*	*15-110*			
Surrogate: 2-Chlorophenol-d4	*0.121*		mg/L	*0.1500*		*80*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*0.0911*		mg/L	*0.1000*		*91*	*30-130*			
Surrogate: 2-Fluorophenol	*0.101*		mg/L	*0.1500*		*67*	*15-110*			
Surrogate: Nitrobenzene-d5	*0.0988*		mg/L	*0.1000*		*99*	*30-130*			
Surrogate: Phenol-d6	*0.126*		mg/L	*0.1500*		*84*	*15-110*			
Surrogate: p-Terphenyl-d14	*0.105*		mg/L	*0.1000*		*105*	*30-130*			
LCS Dup										
1,1-Biphenyl	0.091	0.010	mg/L	0.1000		91	40-140	4	20	
1,2,4-Trichlorobenzene	0.083	0.010	mg/L	0.1000		83	40-140	2	20	
1,2-Dichlorobenzene	0.083	0.010	mg/L	0.1000		83	40-140	3	20	
1,3-Dichlorobenzene	0.080	0.010	mg/L	0.1000		80	40-140	3	20	
1,4-Dichlorobenzene	0.081	0.010	mg/L	0.1000		81	40-140	3	20	
2,3,4,6-Tetrachlorophenol	0.091	0.050	mg/L	0.1000		91	40-140	6	20	
2,4,5-Trichlorophenol	0.099	0.010	mg/L	0.1000		99	30-130	7	20	
2,4,6-Trichlorophenol	0.096	0.010	mg/L	0.1000		96	30-130	8	20	
2,4-Dichlorophenol	0.090	0.010	mg/L	0.1000		90	30-130	8	20	
2,4-Dimethylphenol	0.084	0.050	mg/L	0.1000		84	30-130	10	20	
2,4-Dinitrophenol	0.121	0.050	mg/L	0.1000		121	30-130	13	20	
2,4-Dinitrotoluene	0.108	0.010	mg/L	0.1000		108	40-140	5	20	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
2,6-Dinitrotoluene	0.097	0.010	mg/L	0.1000		97	40-140	5	20	
2-Chloronaphthalene	0.087	0.010	mg/L	0.1000		87	40-140	4	20	
2-Chlorophenol	0.084	0.010	mg/L	0.1000		84	30-130	10	20	
2-Methylphenol	0.088	0.010	mg/L	0.1000		88	30-130	10	20	
2-Nitroaniline	0.121	0.010	mg/L	0.1000		121	40-140	6	20	
2-Nitrophenol	0.090	0.010	mg/L	0.1000		90	30-130	7	20	
3,3´-Dichlorobenzidine	0.093	0.020	mg/L	0.1000		93	40-140	3	20	
3+4-Methylphenol	0.186	0.020	mg/L	0.2000		93	30-130	11	20	
3-Nitroaniline	0.102	0.010	mg/L	0.1000		102	40-140	5	20	
4,6-Dinitro-2-Methylphenol	0.120	0.050	mg/L	0.1000		120	30-130	8	20	
4-Bromophenyl-phenylether	0.096	0.010	mg/L	0.1000		96	40-140	5	20	
4-Chloro-3-Methylphenol	0.098	0.010	mg/L	0.1000		98	30-130	6	20	
4-Chloroaniline	0.068	0.020	mg/L	0.1000		68	40-140	6	20	
4-Chloro-phenyl-phenyl ether	0.094	0.010	mg/L	0.1000		94	40-140	6	20	
4-Nitroaniline	0.109	0.010	mg/L	0.1000		109	40-140	6	20	
4-Nitrophenol	0.110	0.050	mg/L	0.1000		110	30-130	6	20	
Acetophenone	0.089	0.010	mg/L	0.1000		89	40-140	7	20	
Aniline	0.087	0.010	mg/L	0.1000		87	40-140	9	20	
Azobenzene	0.121	0.020	mg/L	0.1000		121	40-140	17	20	
Benzoic Acid	0.101	0.100	mg/L	0.1000		101	40-140	18	20	
Benzyl Alcohol	0.088	0.010	mg/L	0.1000		88	40-140	3	20	
bis(2-Chloroethoxy)methane	0.093	0.010	mg/L	0.1000		93	40-140	4	20	
bis(2-Chloroethyl)ether	0.092	0.010	mg/L	0.1000		92	40-140	5	20	
bis(2-chloroisopropyl)Ether	0.087	0.010	mg/L	0.1000		87	40-140	5	20	
bis(2-Ethylhexyl)phthalate	0.122	0.006	mg/L	0.1000		122	40-140	6	20	
Butylbenzylphthalate	0.120	0.010	mg/L	0.1000		120	40-140	6	20	
Carbazole	0.102	0.010	mg/L	0.1000		102	40-140	3	20	
Dibenzofuran	0.092	0.010	mg/L	0.1000		92	40-140	4	20	
Diethylphthalate	0.099	0.010	mg/L	0.1000		99	40-140	5	20	
Dimethylphthalate	0.098	0.010	mg/L	0.1000		97	40-140	3	20	
Di-n-butylphthalate	0.107	0.010	mg/L	0.1000		107	40-140	4	20	
Di-n-octylphthalate	0.116	0.010	mg/L	0.1000		116	40-140	8	20	
Hexachlorobutadiene	0.081	0.010	mg/L	0.1000		81	40-140	0.8	20	
Hexachlorocyclopentadiene	0.056	0.025	mg/L	0.1000		56	40-140	5	20	
Hexachloroethane	0.083	0.005	mg/L	0.1000		83	40-140	2	20	
Isophorone	0.081	0.010	mg/L	0.1000		81	40-140	5	20	
Nitrobenzene	0.092	0.010	mg/L	0.1000		92	40-140	3	20	
N-Nitrosodimethylamine	0.086	0.010	mg/L	0.1000		86	40-140	2	20	
N-Nitroso-Di-n-Propylamine	0.097	0.010	mg/L	0.1000		97	40-140	8	20	
N-nitrosodiphenylamine	0.090	0.010	mg/L	0.1000		90	40-140	3	20	
Phenol	0.096	0.010	mg/L	0.1000		96	30-130	10	20	
Pyridine	0.075	0.100	mg/L	0.1000		75	40-140	3	20	
Surrogate: 1,2-Dichlorobenzene-d4	*0.0868*		mg/L	*0.1000*		*87*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*0.153*		mg/L	*0.1500*		*102*	*15-110*			
Surrogate: 2-Chlorophenol-d4	*0.131*		mg/L	*0.1500*		*87*	*15-110*			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
Surrogate: 2-Fluorobiphenyl	*0.0922*		mg/L	*0.1000*		*92*	*30-130*			
Surrogate: 2-Fluorophenol	*0.113*		mg/L	*0.1500*		*75*	*15-110*			
Surrogate: Nitrobenzene-d5	*0.0999*		mg/L	*0.1000*		*100*	*30-130*			
Surrogate: Phenol-d6	*0.136*		mg/L	*0.1500*		*91*	*15-110*			
Surrogate: p-Terphenyl-d14	*0.110*		mg/L	*0.1000*		*110*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
Blank										
2-Methylnaphthalene	ND	0.00020	mg/L							
Acenaphthene	ND	0.00020	mg/L							
Acenaphthylene	ND	0.00020	mg/L							
Anthracene	ND	0.00020	mg/L							
Benzo(a)anthracene	ND	0.00005	mg/L							
Benzo(a)pyrene	ND	0.00005	mg/L							
Benzo(b)fluoranthene	ND	0.00005	mg/L							
Benzo(g,h,i)perylene	ND	0.00020	mg/L							
Benzo(k)fluoranthene	ND	0.00005	mg/L							
Chrysene	ND	0.00005	mg/L							
Dibenzo(a,h)Anthracene	ND	0.00005	mg/L							
Fluoranthene	ND	0.00020	mg/L							
Fluorene	ND	0.00020	mg/L							
Hexachlorobenzene	ND	0.00020	mg/L							
Indeno(1,2,3-cd)Pyrene	ND	0.00005	mg/L							
Naphthalene	ND	0.00020	mg/L							
Pentachlorophenol	ND	0.00090	mg/L							
Phenanthrene	ND	0.00020	mg/L							
Pyrene	ND	0.00020	mg/L							
LCS										
2-Methylnaphthalene	0.0777	0.00400	mg/L	0.1000		78	40-140			
Acenaphthene	0.0856	0.00400	mg/L	0.1000		86	40-140			
Acenaphthylene	0.0791	0.00400	mg/L	0.1000		79	40-140			
Anthracene	0.0873	0.00400	mg/L	0.1000		87	40-140			
Benzo(a)anthracene	0.0848	0.00100	mg/L	0.1000		85	40-140			
Benzo(a)pyrene	0.0908	0.00100	mg/L	0.1000		91	40-140			
Benzo(b)fluoranthene	0.0933	0.00100	mg/L	0.1000		93	40-140			
Benzo(g,h,i)perylene	0.0917	0.00400	mg/L	0.1000		92	40-140			
Benzo(k)fluoranthene	0.0894	0.00100	mg/L	0.1000		89	40-140			
Chrysene	0.0895	0.00100	mg/L	0.1000		89	40-140			
Dibenzo(a,h)Anthracene	0.0939	0.00100	mg/L	0.1000		94	40-140			
Fluoranthene	0.0967	0.00400	mg/L	0.1000		97	40-140			
Fluorene	0.0926	0.00400	mg/L	0.1000		93	40-140			
Hexachlorobenzene	0.104	0.00400	mg/L	0.1000		104	40-140			
Indeno(1,2,3-cd)Pyrene	0.101	0.00100	mg/L	0.1000		101	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Semi-Volatile Organic Compounds										
Batch DC01608 - 3520C										
Naphthalene	0.0762	0.00400	mg/L	0.1000		76	40-140			
Pentachlorophenol	0.0713	0.0180	mg/L	0.1000		71	30-130			
Phenanthrene	0.0869	0.00400	mg/L	0.1000		87	40-140			
Pyrene	0.0968	0.00400	mg/L	0.1000		97	40-140			
LCS Dup										
2-Methylnaphthalene	0.0848	0.00400	mg/L	0.1000		85	40-140	9	20	
Acenaphthene	0.0917	0.00400	mg/L	0.1000		92	40-140	7	20	
Acenaphthylene	0.0853	0.00400	mg/L	0.1000		85	40-140	7	20	
Anthracene	0.0922	0.00400	mg/L	0.1000		92	40-140	5	20	
Benzo(a)anthracene	0.0895	0.00100	mg/L	0.1000		89	40-140	5	20	
Benzo(a)pyrene	0.0971	0.00100	mg/L	0.1000		97	40-140	7	20	
Benzo(b)fluoranthene	0.0993	0.00100	mg/L	0.1000		99	40-140	6	20	
Benzo(g,h,i)perylene	0.0947	0.00400	mg/L	0.1000		95	40-140	3	20	
Benzo(k)fluoranthene	0.0952	0.00100	mg/L	0.1000		95	40-140	6	20	
Chrysene	0.0936	0.00100	mg/L	0.1000		94	40-140	5	20	
Dibenzo(a,h)Anthracene	0.0961	0.00100	mg/L	0.1000		96	40-140	2	20	
Fluoranthene	0.102	0.00400	mg/L	0.1000		102	40-140	5	20	
Fluorene	0.0988	0.00400	mg/L	0.1000		99	40-140	7	20	
Hexachlorobenzene	0.115	0.00400	mg/L	0.1000		115	40-140	11	20	
Indeno(1,2,3-cd)Pyrene	0.104	0.00100	mg/L	0.1000		104	40-140	3	20	
Naphthalene	0.0798	0.00400	mg/L	0.1000		80	40-140	5	20	
Pentachlorophenol	0.0766	0.0180	mg/L	0.1000		77	30-130	7	20	
Phenanthrene	0.0922	0.00400	mg/L	0.1000		92	40-140	6	20	
Pyrene	0.105	0.00400	mg/L	0.1000		105	40-140	8	20	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: NBC III

ESS Laboratory Work Order: 20C0407

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/TB

Shipped/Delivered Via: Client

ESS Project ID: 20C0407
Date Received: 3/12/2020
Project Due Date: 3/19/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	23032	Yes	N/A	Yes	1L Amber	NP	
1	23033	Yes	N/A	Yes	1L Amber	NP	
1	23034	Yes	N/A	Yes	1L Amber	NP	
1	23035	Yes	N/A	Yes	1L Amber	NP	
1	23036	Yes	N/A	Yes	1L Amber	NP	
1	23042	Yes	N/A	Yes	250 mL Poly	HNO3	
1	23044	Yes	No	Yes	VOA Vial	HCl	
1	23045	Yes	No	Yes	VOA Vial	HCl	
1	23046	Yes	No	Yes	VOA Vial	HCl	
2	23037	Yes	N/A	Yes	1L Amber	NP	
2	23038	Yes	N/A	Yes	1L Amber	NP	
2	23039	Yes	N/A	Yes	1L Amber	NP	
2	23040	Yes	N/A	Yes	1L Amber	NP	
2	23041	Yes	N/A	Yes	1L Amber	NP	
2	23043	Yes	N/A	Yes	250 mL Poly	HNO3	
2	23047	Yes	No	Yes	VOA Vial	HCl	
2	23048	Yes	No	Yes	VOA Vial	HCl	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/TB

ESS Project ID: 20C0407
Date Received: 3/12/2020

2	23049	Yes	No	Yes	VOA Vial	HCl

2nd Review

Were all containers scanned into storage/lab? Initials _____ Yes / No

Are barcode labels on correct containers? Yes / No / NA

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 3/12/20 1517

Reviewed By: _____ Date & Time: 3/12/20 1643

Delivered By: _____ 3/12/20 1643

CHAIN OF CUSTODY

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

ESS Lab # 2C0407

Reporting Limits: RIDEM RADEC/ICPGC

Electonic Deliverables: ☒ Data Checker ☒ Excel ☐ Other (Please Specify →)

Turn Time: 5 Days

Regulatory State: RI

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Company Name: Bohl Group

Project #: 8412

Project Name: NBC IIA-4 and IIA-5

Contact Person: Jon McLaughlin

Address: 701 George Washington Highway

City: Lincoln

State: RI

Zip Code: 02865

PO #:

Telephone Number: 401.337.2382

FAX Number:

Email Address: jmclaughlin@bohl-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	SVOCs	PCBs	TPH	PP-13 Metals
1	3/12/20	11:00	Grab	GW	MW-4	X	X	X	X	X
2	3/12/20	9:35	Grab	GW	MW-7	X	X	X	X	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*

Number of Containers per Sample:

	VOCs	SVOCs	PCBs	TPH	PP-13 Metals
V	7	2	3		
AG	6	1	5		
P	3	4	1		

Sampled by: Scott Mc

Comments: Please specify "Other" preservative and containers types in this space

Laboratory Use Only

Cooler Present: Y ○ Drop Off

Seals Intact: NA ○ Pickup

Cooler Temperature: 1.9 °C

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
3/12/20 13:57	3/12/20 1357		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

APEPNDIX I

RIDOT I-95 ELUR AND SMP

ENVIRONMENTAL LAND USAGE RESTRICTION

This Declaration of Environmental Land Usage Restriction (.Restriction.) is made on this _____ day of _____, 20___ by Rhode Island Department of Transportation (RIDOT), and its successors and/or assigns (hereinafter, the "Grantor").

WITNESSETH:

WHEREAS, the Grantor Rhode Island Department of Transportation is the owner in fee simple of certain real property identified as A.P 23 Lot 589, A.P. 23 Lot 619, A.P 53 Lot 703, A.P. Lot 766 and a portion of A.P. 54 Lot 806 in Pawtucket, Rhode Island (the "Property"), more particularly described in Exhibit 1A (Legal Descriptions) which is attached hereto and made a part hereof;

WHEREAS, the Property [as identified in the Class I survey which is attached hereto as Exhibit 2A (ELUR Parcels)] and is made a part hereof has been determined to contain soil which is contaminated with certain hazardous materials and/or petroleum in excess of applicable residential direct exposure criteria pursuant to the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases ("Remediation Regulations");

WHEREAS, the Grantor and the Rhode Island Department of Environmental Management ("Department") have determined that the environmental land use restrictions set forth below are consistent with the regulations adopted by the Department pursuant to R.I.G.L. § 23-19.14-1 and that this restriction shall be a Conservation Restriction pursuant to R.I.G.L. § 34-39--1 et. seq. and shall not be subject to the 30 year limitation provided in R.I.G.L. § 34-4-21;

WHEREAS, the Department's written approval of this Restriction is contained in the document entitled: Remedial Approval Letter CASE # 2009-013 dated January 21, 2010 issued pursuant to the Remediation Regulations;

WHEREAS, to prevent exposure to or migration of hazardous materials and petroleum and to abate hazards to human health and/or the environment, and in accordance with the Remedial Approval Letter, the Grantor desires to impose certain restrictions upon the use, occupancy, and activities of and at the Property;

WHEREAS, the Grantor believes that this Restriction will effectively protect public health and the environment from such contamination; and

WHEREAS, the Grantor intends that such restrictions shall run with the land and be binding upon and enforceable against the Grantor and the Grantor's successors and assigns.

NOW, THEREFORE, Grantor agrees as follows:

A. Restrictions Applicable to the Property: In accordance with the Remedial Approval Letter, the use, occupancy and activity of and at the Property is restricted as follows:

i. No residential use of the Property shall be permitted. Any future use of the property is limited to industrial/commercial activity that is not contrary to Department approvals and restrictions contained herein;

ii. No groundwater at the Property shall be used as potable water;

iii. No soil at the Property shall be disturbed in any manner without written permission of the Department's Office of Waste Management, except as permitted in the Remedial Action Work Plan (RAWP) and Soil Management Plan (SMP) approved by the Department in a written Remedial Approval Letter CASE # 2009-013 dated January 21, 2010 Exhibit 1B and attached hereto;

iv. Humans engaged in activities at the Property shall not be exposed to soils containing hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved direct exposure criteria set forth in the Remediation Regulations;

v. The engineered controls at the Property described in the Post Remediation Soil Management Plan contained in Exhibit 2B attached hereto shall not be disturbed and shall be properly maintained to prevent humans from being exposed to soils containing hazardous materials and/or petroleum in concentrations exceeding the applicable Department-approved residential direct exposure criteria in accordance with the Remediation Regulations;

B. No action shall be taken, allowed, suffered, or omitted at the Property if such action or omission is reasonably likely to:

i Create a risk of migration of hazardous materials and/or petroleum;

ii Create a potential hazard to human health or the environment; or

iii Result in the disturbance of any engineered controls utilized at the Property, except as permitted in the Department-approved Post Remediation Soil Management Plan contained in Exhibit 2B.

C. Emergencies: In the event of any emergency which presents a significant risk to human health or to the environment, including but not limited to, maintenance and repair of utility lines or a response to emergencies such as fire or flood, the application of Paragraphs A (iii. - viii.) and B above may be suspended, provided such risk cannot be abated without suspending such Paragraphs and the Grantor complies with the following:

i Grantor shall notify the Department's Office of Waste Management in writing of the emergency as soon as possible but no more than three (3) business days after Grantor's having learned of the emergency. (This does not remove Grantor's obligation to notify any other necessary state, local or federal agencies.);

ii Grantor shall limit both the extent and duration of the suspension to the minimum period

reasonable and necessary to adequately respond to the emergency;

iii Grantor shall implement reasonable measures necessary to prevent actual, potential, present and future risk to human health and the environment resulting from such suspension;

iv Grantor shall communicate at the time of written notification to the Department its intention to conduct the emergency response actions and provide a schedule to complete the emergency response actions;

v Grantor shall continue to implement the emergency response actions, on the schedule submitted to the Department, to ensure that the Property is remediated, if applicable in accordance with the Remediation Regulations (or applicable variance) or restored to its condition prior to such emergency. Based upon information submitted to the Department at the time the ELUR was recorded pertaining to known environmental conditions at the Property, emergency maintenance and repair of utility lines shall only require restoration of the Property to its condition prior to the maintenance and repair of the utility lines; and

vi Grantor shall submit to the Department, within ten (10) days after the completion of the emergency response action, a status report describing the emergency activities that have been completed.

D. Release of Restriction; Alterations of Subject Area: The Grantor shall not make, or allow or suffer to be made, any alteration of any kind in, to, or about any portion of the Property inconsistent with this Restriction unless the Grantor has received the Department's prior written approval for such alteration. If the Department determines that the proposed alteration is significant, the Department may require the amendment of this Restriction. Alterations deemed insignificant by the Department will be approved via a letter from the Department. The Department shall not approve any such alteration and shall not release the Property from the provisions of this Restriction unless the Grantor demonstrates to the Department's satisfaction that Grantor has managed the Property in accordance with applicable regulations.

E. Notice of Lessees and Other Holders of Interests in the Property: The Grantor, or any future holder of any interest in the Property, shall cause any lease, grant, or other transfer of any interest in the Property to include a provision expressly requiring the lessee, grantee, or transferee to comply with this Restriction. The failure to include such provision shall not affect the validity or applicability of this Restriction to the Property.

F. Enforceability: If any court of competent jurisdiction determines that any provision of this Restriction is invalid or unenforceable, the Grantor shall notify the Department in writing within fourteen (14) days of such determination.

G. Binding Effect: All of the terms, covenants, and conditions of this Restriction shall run with the land and shall be binding on the Grantor, its successors and assigns, and each Owner and any other party entitled to control, possession or use of the Property during such period of

Ownership or possession.

H. Inspection & Non-Compliance: It shall be the obligation of the Grantor, or any future holder of any interest in the Property, to provide for annual inspections of the Property for compliance with the ELUR in accordance with Department requirements. See Exhibit 3B

A qualified environmental professional will, on behalf of the Grantor or future holder of any interest in the Property, evaluate the compliance status of the Property on an annual basis. Upon completion of the evaluation, the environmental professional will prepare and simultaneously submit to the Department and to the Grantor or future holder of any interest in the Property an evaluation report detailing the findings of the inspection, and noting any compliance violations at the Property. If the Property is determined to be out of compliance with the terms of the ELUR, the Grantor or future holder of any interest in the Property shall submit a corrective action plan in writing to the Department within ten (10) days of receipt of the evaluation report, indicating the plans to bring the Property into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

In the event of any violation of the terms of this Restriction, which remains uncured more than ninety (90) days after written notice of violation, all Department approvals and agreements relating to the Property may be voided at the sole discretion of the Department.

I. Terms Used Herein: The definitions of terms used herein shall be the same as the definitions contained in Section 3 (DEFINITIONS) of the Remediation Regulations.

IN WITNESS WHEREOF, the Grantor has hereunto set (his/her) hand and seal on the day and year set forth above.

[**Name of Person(s), company, LLC or LLP**]

By: _____ _____

Grantor (signature) Grantor (typed name)

STATE OF RHODE ISLAND

COUNTY OF PROVIDENCE

In Pawtucket, in said County and State, on the _____ day of _____ , 20___, before me personally appeared _____ , to me known and known by me to be the party executing the foregoing instrument and (he/she) acknowledged said instrument by (him/her) executed to be (his/her) free act and deed.

Notary Public: _____

My Comm. Expires: _____

EXHIBIT 1A

LEGAL DESCRIPTIONS

E.L.U.R. PARCEL A.P. 23 LOT 575

That certain tract or parcel of land situated on the westerly side of River Street, and the northerly side of Division St. in the City of Pawtucket, County of Providence and State of Rhode Island being more particularly bounded and described as follows:

Beginning at a point on the northerly sideline of said Division Street, said point being the southwesterly corner of herein described parcel;

Thence N20° - 28' – 40" W for a distance of one hundred six and 55/100 (106.55) feet to a point;

Thence N76° - 31' – 38" E for a distance of two hundred ninety-seven and 82/100 (297.82) feet to a point in the westerly sideline of said River Street;

Thence S14° - 28' – 40" E along the westerly sideline of said River Street for a distance of one hundred twenty-one and 51/100 (121.51) feet to a point;

Thence southerly bearing southwesterly along the arc of a curve having a radius of twenty and 00/100 (20.00) feet and an arc length of eleven and 91/100 (11.91) feet to a point in the northerly sideline of said Division Street;

Thence S80° - 00' – 57" W along the northerly sideline of said Division Street for a distance of one hundred fifty-four and 26/100 (154.26) feet to a point;

Thence S84° - 15' – 57" W along the northerly sideline of said Division Street for a distance of one hundred thirty and 93/100 (130.93) feet to the point and place of beginning.

The above described parcel contains an area of 35,562 square feet of land more or less (0.82 ac ±) and is shown as A.P. 23 Lot 575 on a plan titled "Environmental Land Usage Restriction Parcels Bridge Replacement Pawtucket Bridge No. 550 Pawtucket, Rhode Island scale 1"=50', date Dec 5, 2014, prepared for Commonwealth Engineers and Consultants Inc. by Crossman Engineering."

E.L.U.R. PARCEL A.P. 23 LOT 589

That certain tract or parcel of land situated between School St. and Water St., and northerly of Division St. in the City of Pawtucket, County of Providence and State of Rhode Island being more particularly bounded and described as follows:

Beginning at a point on the easterly sideline of said Water Street, said point being the southwesterly corner of herein describes parcel;

Thence N08° - 53’ – 48” W along the easterly sideline of said Water Street for a distance of two hundred fifty-seven and 89/100 (257.89) feet to a point;

Thence N60° - 30’ – 27” E for a distance of forty-nine and 90/100 (49.90) feet to a point;

Thence N43° - 51’ – 46” E for a distance of one hundred twenty-two and 40/100 (122.40) feet to a point;

Thence N79° - 39’ – 45” E for a distance of twenty and 11/100 (20.11) feet to a point on the westerly sideline of said School Street;

Thence S09° - 19’ – 57” E along the westerly sideline of said School Street for a distance of two hundred ninety-four and 81/100 (294.81) feet to a point;

Thence S80° - 17’ – 47” W for a distance of eighty and 23/100 (80.23) feet to a point;

Thence S08° - 38’ – 47” E for a distance of twenty-four and 23/100 (24.23) feet to a point, said last 2 courses bounded southerly and easterly by land now or formerly of Sun Refining and Marketing Co.;

Thence S61° - 59’ – 31” W for a distance of ninety-one and 20/100 (91.20) feet to the point and place of beginning, the last course bounded southerly by land now or formerly of Pawtucket Business Associates.

The above described parcel contains an area of 44,717 square feet of land more or less (1.03 ac ±) and is shown as A.P. 23 Lot 589 on a plan titled “Environmental Land Usage Restriction Parcels Bridge Replacement Pawtucket Bridge No. 550 Pawtucket, Rhode Island scale 1”=50’, date Dec 5, 2014, prepared for Commonwealth Engineers and Consultants Inc. by Crossman Engineering.”

E.L.U.R. PARCEL A.P. 23 LOT 619

That certain tract or parcel of land situated between Water Street and the Seekonk River, and northerly of Division St. in the City of Pawtucket, County of Providence and State of Rhode Island being more particularly bounded and described as follows:

Beginning at a point on the easterly side of the Seekonk River, said point being the southwesterly corner of herein described parcel;

Thence N01° - 08' – 52" E for a distance of two hundred fifty-one and 80/100 (251.80) feet to a point;

Thence N81° - 18' – 03" E for a distance of two hundred forty-six and 27/100 (246.27) feet to a point;

Thence N03° - 15' – 42" W for a distance of forty-eight and 38/100 (48.38) feet to a point;

Thence N80° - 25' – 51" E for a distance of one hundred eighty-eight and 80/100 (188.80) feet to a point;

Thence N07° - 10' – 06" W for a distance of twenty and 49/100 (20.49) feet to a point;

Thence N82° - 46' – 46" E for a distance of thirty-six and 00/100 (36.00) feet to a point;

Thence N80° - 25' -51" E for a distance of one hundred forty-nine and 27/100 (149.27) feet to a point;

Thence N60° - 30' – 27" E for a distance of eleven and 75/100 (11.75) feet to a point;

Thence N80° - 26' – 05" E for a distance of nine and 04/100 (9.04) feet to a pint in the westerly sideline of said Water Street;

Thence S08° - 53' – 44" E along the westerly sideline of said Water Street for a distance of two hundred fifty-seven and 24/100 (257.24) feet to a point;

Thence S67° - 51' – 54" W for a distance of seventy-eight and 35/100 (78.35) feet to a point;

Thence S59° - 38' – 08" W for a distance of thirty-seven and 99/100 (37.99) feet to a point;

Thence S84° - 13' – 30" W for a distance of seventy and 00/100 (70.00) feet to a point;

Thence S63° - 05' – 48" W for a distance of thirty-eight and 58/100 (38.58) feet to a point;

Thence S80° - 51' – 51" W for a distance of one hundred forty and 71/100 (140.71) feet to a point on the easterly sideline of River Street;

Thence N14° - 46’ – 52” W along the easterly sideline of said River Street for a distance of twenty-seven and 17/100 (27.17) feet to a point;

Thence S75° - 13’ – 08” W along the northerly side of said River Street for a distance of thirty-three and 66/100 (33.66) feet to a point;

Thence S14° - 28’ – 23” E along the westerly sideline of said River Street for a distance of twenty-five and 02/100 (25.02) feet to a point;

Thence S76° - 31’ – 38” W for a distance of two hundred ninety-seven and 82/100 (297.82) feet to the point and place of beginning.

The above described parcel contains an area of 170,901 square feet of land more or less (3.92 ac ±) and is shown as A.P. 23 Lot 619 on a plan titled “Environmental Land Usage Restriction Parcels Bridge Replacement Pawtucket Bridge No. 550 Pawtucket, Rhode Island scale 1”=50’, date Dec 5, 2014, prepared for Commonwealth Engineers and Consultants Inc. by Crossman Engineering.”

E.L.U.R. PARCEL A.P. 54 LOT 766 AND A PORTION OF A.P. 54 LOT 806

That certain tract or parcel of land situated between Taft Street and Pleasant Street, and northerly of Division St. in the City of Pawtucket, County of Providence and State of Rhode Island being more particularly bounded and described as follows:

Beginning at a point on the easterly sideline of said Pleasant Street, said point being the southwesterly corner of herein described parcel;

Thence N04º – 56' – 31" E along the easterly sideline of said Pleasant Street for a distance of two hundred seventy-five and 76/100 (275.76) feet to a point;

Thence S84° - 09' – 55" E for a distance of one hundred five and 22/100 (105.22) feet to a point on the westerly sideline of said Taft Street, said last course bounded northerly by land now or formerly of Elkin, Alfred A. and Gisele J.;

Thence S01° - 19' - 25" E along the westerly sideline of said Taft Street for a distance of two hundred thirty-eight and 94/100 (238.94) feet to a point;

Thence S79° - 21' – 38" W for a distance of one hundred thirty-six and 29/100 (136.29) feet to the point and place of beginning, said last course bounded southerly by land now or formerly of The City of Pawtucket.

The above described parcel contains an area of 30,573 square feet of land more or less (0.70 ac ±) and is shown as A.P. 54 Lot 766 and a portion of A.P. 54 Lot 806 on a plan titled "Environmental Land Usage Restriction Parcels Bridge Replacement Pawtucket Bridge No. 550 Pawtucket, Rhode Island scale 1"=50', date Dec 5, 2014, prepared for Commonwealth Engineers and Consultants Inc. by Crossman Engineering."

E.L.U.R. PARCEL A.P. 54 LOT 703

That certain tract or parcel of land situated between Taft Street and the Seekonk River, and northerly of Division St. in the City of Pawtucket, County of Providence and State of Rhode Island being more particularly bounded and described as follows:

Beginning at a point on the easterly sideline of said Taft Street, said point being the southwesterly corner of herein described parcel;

Thence N01º – 19' – 25" W along the easterly sideline of said Taft Street for a distance of one hundred ninety nine and 99/100 (199.99) feet to a point;

Thence N88° - 40' – 35" E for a distance of thirty-three and 29/100 (33.29) feet to a point;

Thence S07° - 46' - 57" W for a distance of one hundred twelve and 07/100 (112.07) feet to a point;

Thence S12° - 41' – 17" E for a distance of ninety-one and 12/100 (91.12) feet to a point;

Thence S88° - 40' – 37" W for a distance of thirty-three and 51/100 (33.51) feet to the point and place of beginning, said last course bounded southerly by land now or formerly of the State of RI and Providence Plantations.

The above described parcel contains an area of 4,894 square feet of land more or less (0.11 ac ±) and is shown as A.P. 54 Lot 703 on a plan titled "Environmental Land Usage Restriction Parcels Bridge Replacement Pawtucket Bridge No. 550 Pawtucket, Rhode Island scale 1"=50', date Dec 5, 2014, prepared for Commonwealth Engineers and Consultants Inc. by Crossman Engineering."

EXHIBIT 2A

STAMPED SITE PLAN

LEGEND

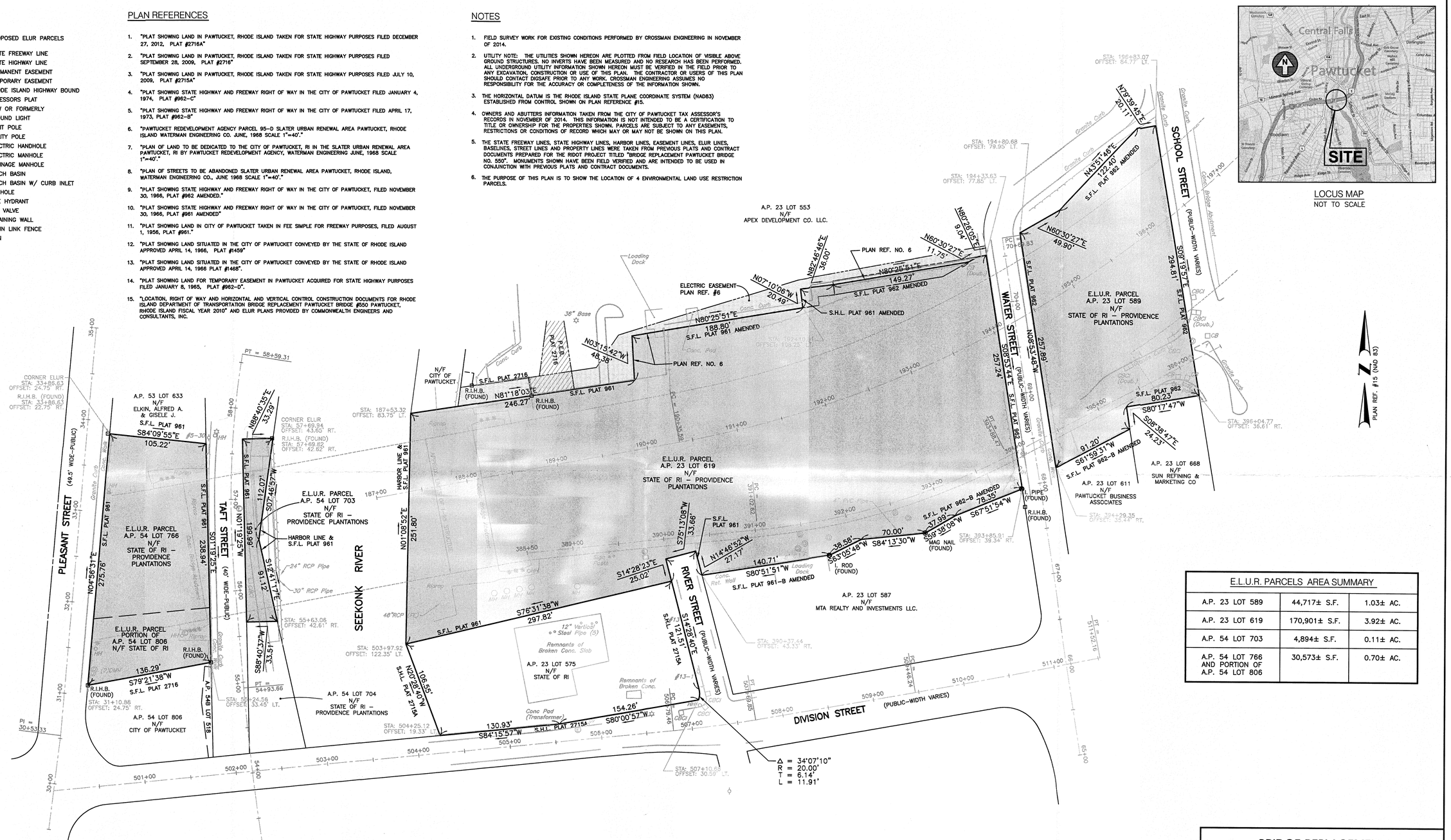
- PROPOSED ELUR PARCELS
- STATE FREEWAY LINE
- STATE HIGHWAY LINE
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- R.I.H.B. — RHODE ISLAND HIGHWAY BOUND
- A.P. — ASSESSORS PLAT
- N/F — NOW OR FORMERLY
- GROUND LIGHT
- LIGHT POLE
- UTILITY POLE
- HH — ELECTRIC HANDHOLE
- E — ELECTRIC MANHOLE
- D — DRAINAGE MANHOLE
- CB — CATCH BASIN
- CBCI — CATCH BASIN W/ CURB INLET
- MH — MANHOLE
- FH — FIRE HYDRANT
- GV — GAS VALVE
- RETAINING WALL
- C.L.F. — CHAIN LINK FENCE
- SIGN

PLAN REFERENCES

1. "PLAT SHOWING LAND IN PAWTUCKET, RHODE ISLAND TAKEN FOR STATE HIGHWAY PURPOSES FILED DECEMBER 27, 2012, PLAT #2716A"
2. "PLAT SHOWING LAND IN PAWTUCKET, RHODE ISLAND TAKEN FOR STATE HIGHWAY PURPOSES FILED SEPTEMBER 28, 2009, PLAT #2716"
3. "PLAT SHOWING LAND IN PAWTUCKET, RHODE ISLAND TAKEN FOR STATE HIGHWAY PURPOSES FILED JULY 10, 2009, PLAT #2715A"
4. "PLAT SHOWING STATE HIGHWAY AND FREEWAY RIGHT OF WAY IN THE CITY OF PAWTUCKET FILED JANUARY 4, 1974, PLAT #962–C"
5. "PLAT SHOWING STATE HIGHWAY AND FREEWAY RIGHT OF WAY IN THE CITY OF PAWTUCKET FILED APRIL 17, 1973, PLAT #962–B"
6. "PAWTUCKET REDEVELOPMENT AGENCY PARCEL 95–D SLATER URBAN RENEWAL AREA PAWTUCKET, RHODE ISLAND WATERMAN ENGINEERING CO. JUNE, 1968 SCALE 1"=40'."
7. "PLAN OF LAND TO BE DEDICATED TO THE CITY OF PAWTUCKET, RI IN THE SLATER URBAN RENEWAL AREA PAWTUCKET, RI BY PAWTUCKET REDEVELOPMENT AGENCY, WATERMAN ENGINEERING JUNE, 1968 SCALE 1"=40'."
8. "PLAN OF STREETS TO BE ABANDONED SLATER URBAN RENEWAL AREA PAWTUCKET, RHODE ISLAND, WATERMAN ENGINEERING CO., JUNE 1968 SCALE 1"=40'."
9. "PLAT SHOWING STATE HIGHWAY AND FREEWAY RIGHT OF WAY IN THE CITY OF PAWTUCKET, FILED NOVEMBER 30, 1966, PLAT #962 AMENDED."
10. "PLAT SHOWING STATE HIGHWAY AND FREEWAY RIGHT OF WAY IN THE CITY OF PAWTUCKET, FILED NOVEMBER 30, 1966, PLAT #961 AMENDED"
11. "PLAT SHOWING LAND IN CITY OF PAWTUCKET TAKEN IN FEE SIMPLE FOR FREEWAY PURPOSES, FILED AUGUST 1, 1956, PLAT #961."
12. "PLAT SHOWING LAND SITUATED IN THE CITY OF PAWTUCKET CONVEYED BY THE STATE OF RHODE ISLAND APPROVED APRIL 14, 1966, PLAT #1459"
13. "PLAT SHOWING LAND SITUATED IN THE CITY OF PAWTUCKET CONVEYED BY THE STATE OF RHODE ISLAND APPROVED APRIL 14, 1966 PLAT #1468".
14. "PLAT SHOWING LAND FOR TEMPORARY EASEMENT IN PAWTUCKET ACQUIRED FOR STATE HIGHWAY PURPOSES FILED JANUARY 8, 1965, PLAT #962–D".
15. "LOCATION, RIGHT OF WAY AND HORIZONTAL AND VERTICAL CONTROL CONSTRUCTION DOCUMENTS FOR RHODE ISLAND DEPARTMENT OF TRANSPORTATION BRIDGE REPLACEMENT PAWTUCKET BRIDGE #550 PAWTUCKET, RHODE ISLAND FISCAL YEAR 2010" AND ELUR PLANS PROVIDED BY COMMONWEALTH ENGINEERS AND CONSULTANTS, INC.

NOTES

1. FIELD SURVEY WORK FOR EXISTING CONDITIONS PERFORMED BY CROSSMAN ENGINEERING IN NOVEMBER OF 2014.
2. UTILITY NOTE: THE UTILITES SHOWN HEREON ARE PLOTTED FROM FIELD LOCATION OF VISIBLE ABOVE GROUND STRUCTURES. NO INVERTS HAVE BEEN MEASURED AND NO RESEARCH HAS BEEN PERFORMED. ALL UNDERGROUND UTILITY INFORMATION SHOWN HEREON MUST BE VERIFIED IN THE FIELD PRIOR TO ANY EXCAVATION, CONSTRUCTION OR USE OF THIS PLAN. THE CONTRACTOR OR USERS OF THIS PLAN SHOULD CONTACT DIGSAFE PRIOR TO ANY WORK. CROSSMAN ENGINEERING ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
3. THE HORIZONTAL DATUM IS THE RHODE ISLAND STATE PLANE COORDINATE SYSTEM (NAD83) ESTABLISHED FROM CONTROL SHOWN ON PLAN REFERENCE #15.
4. OWNERS AND ABUTTERS INFORMATION TAKEN FROM THE CITY OF PAWTUCKET TAX ASSESSOR'S RECORDS IN NOVEMBER OF 2014. THIS INFORMATION IS NOT INTENDED TO BE A CERTIFICATION TO TITLE OR OWNERSHIP FOR THE PROPERTIES SHOWN. PARCELS ARE SUBJECT TO ANY EASEMENTS, RESTRICTIONS OR CONDITIONS OF RECORD WHICH MAY OR MAY NOT BE SHOWN ON THIS PLAN.
5. THE STATE FREEWAY LINES, STATE HIGHWAY LINES, HARBOR LINES, EASEMENT LINES, ELUR LINES, BASELINES, STREET LINES AND PROPERTY LINES WERE TAKEN FROM PREVIOUS PLATS AND CONTRACT DOCUMENTS PREPARED FOR THE RIDOT PROJECT TITLED "BRIDGE REPLACEMENT PAWTUCKET BRIDGE NO. 550". MONUMENTS SHOWN HAVE BEEN FIELD VERIFIED AND ARE INTENDED TO BE USED IN CONJUNCTION WITH PREVIOUS PLATS AND CONTRACT DOCUMENTS.
6. THE PURPOSE OF THIS PLAN IS TO SHOW THE LOCATION OF 4 ENVIRONMENTAL LAND USE RESTRICTION PARCELS.



LOCUS MAP
NOT TO SCALE

E.L.U.R. PARCELS AREA SUMMARY		
A.P. 23 LOT 589	44,717± S.F.	1.03± AC.
A.P. 23 LOT 619	170,901± S.F.	3.92± AC.
A.P. 54 LOT 703	4,894± S.F.	0.11± AC.
A.P. 54 LOT 766 AND PORTION OF A.P. 54 LOT 806	30,573± S.F.	0.70± AC.

CERTIFICATION

THIS PLAN SUBSTANTIALLY CONFORMS TO A CLASS 1 STANDARD AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS.

BY: Roger D. Briggs 12/5/14

REGISTERED PROFESSIONAL LAND SURVEYOR — DATE
CROSSMAN ENGINEERING

ROGER D. BRIGGS — No. 1943 — PROFESSIONAL LAND SURVEYOR — 12/5/14

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

CROSSMAN ENGINEERING
151 Centerville Road | Warwick, Rhode Island 02886

BRIDGE REPLACEMENT PAWTUCKET BRIDGE NO. 550

PAWTUCKET — RHODE ISLAND

ENVIRONMENTAL LAND USAGE RESTRICTION PARCELS

CHECKED BY R.D.B. DATE DEC. 5, 2014 SCALE 1" = 50'

V:\1485-ELUR\dwg\CURRENT\1485-ELUR.dwg, Layout1, 12/12/2014 9:47:29 AM, 1:1

EXHIBIT 1B

Remedial Approval Letter CASE # 2009-013

Dated January 21, 2010

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

State of Rhode Island
Dept. of Transportation
JAN 22 2010
Engineering
Received

REMEDIAL APPROVAL LETTER
CASE # 2009-013

Mr. Peter Healey, P.E.
Supervising Chief Engineer
RI Department of Transportation
Two Capital Hill
Providence, Rhode Island 02903-1124

January 21, 2010

RE: Contract #1: Pawtucket Bridge #550 Replacement and Improvements and ROW Elm Street, Water Street, River Street, George Street, Garden Street, Pleasant Street Pine Street and Taft Street (Plat 23, Lots 619, 589/ Plat 54, Lots 703,766,827)

Dear Mr. Healey:

On February 24, 2004, the Rhode Island Department of Environmental Management's (the Department) Office of Waste Management (the Office) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in a timely and cost-effective manner. A Remedial Approval Letter is a document used by the Department to approve remedial actions at contaminated sites that do not involve the use of complex engineered systems or techniques (e.g., groundwater pump and treat systems, soil vapor extraction systems, etc.).

The Office has received and reviewed the following documents:

- Site Investigation Report (Two Volumes) by Wright-Pierce, Inc. (WPI) dated September 18, 2009, and received September 22, 2009;

- Remedial Action Work Plan (Revised) for the Pawtucket River Bridge #550 Replacement and Improvements, Pawtucket R.I. dated December 23, 2009, received January 6, 2010, and prepared by Wright-Pierce Engineering for Commonwealth Engineers & Consultants, Inc. on behalf of the R.I. Department of Transportation.

- Construction Phase Soil Management Plan (Revised) for the Pawtucket River Bridge #550 Replacement and Improvements, Pawtucket R.I. dated December 23, 2009,

30% post-consumer fiber

received January 6, 2010, and prepared by Wright-Pierce Engineering for Commonwealth Engineers & Consultants, Inc. on behalf of the R.I. Department of Transportation; and

- Public Notice to abutters dated October 20, 2009.

Together these documents fulfill the requirements of Section 8.00 (Risk Management) and Section 9.00 (Remedial Action Work Plan (RAWP)) of the Remediation Regulations.

At this time, the Office of Waste Management offers its concurrence with the RAWP and Construction Phase Soil Management Plan (SMP) that details the following proposed remedial action at the property:

Contract #1- Implement the approved Remedial Action Work Plan (RAWP) and Construction SMP for all contaminated soils associated with the Pawtucket Bridge #550 Replacement and Improvement project.

Upon completion of all site construction and remedial work associated with each contract, RIDOT shall submit a Closure Report with all disposal documentation, laboratory analysis and a draft Environmental Land Usage Restriction (ELUR) with an SMP, for review and approval. The ELUR to be recorded on the property will restrict certain activities on the entire site and will also ensure that the engineered cap is not disturbed. The ELUR will include a post-construction SMP, which will outline the procedures for managing the soils onsite should disturbances below the cap be required after construction. The ELUR will require maintenance of all engineered controls and will act to further limit direct exposure to contaminated areas. As part of the ELUR, it is the responsibility of the RIDOT to provide for annual inspections of the property by a qualified environmental professional, and to submit a report, subject to review by the Department, which shall certify that the property is in compliance with the terms of the ELUR.

Soil material excavated as part of this project which is not going to be placed under an approved capped surface, as part of the abovementioned engineered and institutional controls must be assumed to be contaminated and therefore jurisdictional until analytical testing has determined otherwise. It is the responsibility of the RIDOT and its contractor (s) to ensure that all soil materials and solid waste excavated is properly characterized and is managed according to all appropriate local, State and Federal regulations. All solid waste must be disposed of at a licensed disposal facility. Additionally, any inaccessible contaminated soil and/or residual groundwater that cannot be remediated may be subject to additional post closure remedial requirements.

The Department approves the proposed RAWP and SMP provided that all activities and procedures detailed in the RAWP are strictly adhered to. Any significant changes to the

RAWP shall be pre-approved by the Department, and any minor changes shall be reported to the Department by telephone within one (1) day and in writing within five (5) working days.

RIDOT is reminded of its obligation to submit bimonthly updates regarding the status of the remediation work being performed at the Site. These updates must be submitted to the Department in an electronic format, via e-mail (with supporting photo-documentation, if appropriate) during the duration of the remediation project. One hard copy must also be submitted for the Department's file. In addition, dust suppression techniques must be employed at all times during all soil disturbing/handling activities at the Site in order to minimize the generation of fugitive dust.

This Remedial Approval Letter does not remove your obligation to obtain any other necessary permits from other local, state, and/or federal agencies. Please notify the Department at least forty-eight (48) hours in advance of any remedial work.

Within thirty (30) days of completion of all remedial work, including site capping and bridge construction completion, please forward a Closure Report summarizing the performed activities, inclusive of any disposal documentation and laboratory sampling analysis. Concurrently, the Department shall review the draft ELUR and SMP provided in the RAWP for final review and approval. Upon approval by the Department of the Closure Report, ELUR and SMP, the RIDOT shall record the ELUR and SMP in the Land Evidence Records for the City of Pawtucket and return a recorded copy of the document to the Department within 15 days of recording. Upon receipt, the Department will issue a Letter of Compliance.

If you have any questions regarding this letter, please contact me by telephone at (401) 222-2797, ext. 7102 or by e-mail at jeff.crawford@dem.ri.gov.

Sincerely,

Jeffrey Crawford
Principal Environmental Scientist

Authorized:

Kelly Owens
Kelly Owens
Supervising Engineer

EXHIBIT 2B

POST REMEDIATION SOIL MANAGEMENT PLAN

POST REMEDIATION SOIL MANAGEMENT PLAN
RIDOT I-95 ROW ("PROPERTY")
(A.P 23 LOT 589, A.P. 23 LOT 619, A.P 53 LOT 703, A.P. LOT 766
& A PORTION OF A.P. 54 LOT 806)
PAWTUCKET, RHODE ISLAND

This Post Remediation Soil Management Plan (PRSMP) has been prepared to establish procedures that will be followed should future construction/maintenance activities at the Property require the need to manage soils excavated from the subsurface or when existing site surfaces/Rhode Island Department of Environmental Management ("Department") approved engineered controls (asphalt, concrete, landscaping, unfenced grass areas, fenced grassed areas, riprap and/or foundations) are disturbed. The plan serves to supplement, and will be initiated by, the RIDEM notification requirement established by the Environmental Land Use Restriction (ELUR) for the property.

Background

The Property, located within the limits of the RIDOT I-95 ROW underwent remedial activities in conjunction with the RIDOT's Pawtucket Bridge No.550 Replacement and Improvements. All remedial activities discussed were conducted in accordance with the Department's Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (short title: Remediation Regulations), August 1996, as amended February 2004 and November 2011, RIDEM's Remedial Decision Letter dated January 8, 2010 and RIDEM's Remedial Approval Letter dated January 21, 2010.

The Property was found to contain arsenic, lead, Total Petroleum Hydrocarbon (TPHs), Polycyclic Aromatic Hydrocarbon (PAH) and Volatile Organic Compounds (VOCs) based on Phase I, Phase II and Phase II Environmental Site Assessments and investigations performed on the Property. As identified in the Revised December 2009 Remedial Action Work Plan, the Department approved remedial activities conducted on the Property consisted of: precharacterizing insitu soils prior to and during construction via test pitting to enable excavation, removal, hauling and disposal at an approved disposal site by the Contractor; conducting asbestos abatement and demolishing the building on Parcel 230575 to the slab foundation; stockpiling excavated soils and characterizing stockpiled soils prior to removal, hauling and disposal of soils at an approved disposal site by the Contractor; having a qualified 3rd party remediation company characterize, excavate, remove, haul and dispose of hot spot soils; and reviewing available analytical results for imported backfill to ensure material met RDEC requirements.

The regulated site soils have been either completely removed and disposal at an approved disposal site or covered with Department approved engineered controls, consisting of bridge or MSE wall foundations, asphalt pavement, concrete, landscaping, unfenced grass areas, fenced grassed areas, riprap and/or foundations in order to prevent direct exposure to regulated soils

and/or infiltration through soils which exceed the Department's Method 1 (GA or GB) Leachability Criteria.

The remedial action, in conjunction with the implementation of an Environmental Land Usage Restriction (ELUR) and this Post Remediation Soil Management Plan will ensure that the RIDOT I-95 ROW, or restricted portion thereof, is not used for any residential activity in the future and that any future use of the property is limited to industrial/commercial activity.

Applicable Area

The remedial action, in conjunction with the implementation of this Post Remediation Soil Management Plan and affiliated Environmental Land Usage Restriction (ELUR) will ensure that the entire RIDOT I-95 ROW Property is not used for any residential activity in the future and that any future use of the property is limited to industrial/commercial activity that is not contrary to Department approvals and restrictions. See Exhibit 2A Site Plan for area covered by this restriction.

Soil Management

The direct exposure pathway is the primary concern at the site. Individuals engaged in activities on the Property may be exposed through incidental ingestion, dermal contact, or inhalation of entrained soil particles if proper precautions are not taken. Therefore, the following procedures will be followed to minimize the potential of exposure.

Most of the RIDOT I-95 ROW Property is fenced with locked gates to restrict unauthorized access around elevated portions of the RIDOT's Pawtucket Bridge No.550 and I-95. The remaining non-roadway RIDOT I-95 and City of Pawtucket ROW associated with at grade entrance or exit ramps are grassed but not fenced. During site work of RIDOT ROW, appropriate notification to RIDOT shall be made and precautions must be taken to restrict unauthorized access to the Property.

During all site/earth work, dust suppression (e.g. watering, etc) techniques must be employed at all times. Due to the nature of past contaminants of concern all deep excavations (greater than 8 feet) in natural insitu soil and soil generated during site activities must be monitored for VOCs. [For example, deep utility excavations (greater than 8 feet) in locations not previously excavated for RIDOT I-95 Improvements.] Due to the nature of past contaminants of concern odors will not be generated.

In the event, an unexpected observation or situation arises during site work (as stated below), such activities will immediately stop. Workers will not attempt to handle the situation themselves but will contact the appropriate authority for further direction.

Most, if not all of the RIDOT ROW Property has been either precharacterized prior to removal and disposal or characterized after excavation and prior to disposal. Due the removal and replacement of the bridge and utilities most the ROW has been characterized with most of the contaminated soils removed and replaced with clean backfill. That said, in the unlikely event that

site work encounters natural insitu soil that may not have been previously characterized, these soils are presumed to be regulated until such time that it is demonstrated to the Department, through soil sampling and laboratory analysis that they are not regulated [Department's Method 1 Residential Direct Exposure Criteria (RDEC) or below]. [For example, deep utility excavations (greater than 8 feet) in locations not previously excavated for RIDOT I-95 Improvements.]

In general, most site/earth work excavated materials will remain on site due to past precharacterization, characterization and backfilling of clean backfill materials on the Property. Excavated material will be used to backfill excavations and area disturbed by excavation returned to its original condition. All excess soil generated or excavated to be disposed offsite will remain on the Property until such time soil sampling and analytical testing is performed by an environmental professional to determine the appropriate disposal and/or management options. Excess soil must be placed on double layers of 10 mil polyethylene/plastic sheeting and covered with 10 mil polyethylene /plastic sheeting during the entire duration of its staging and secured with appropriate controls to limit the loss of the cover and protect against stormwater and/or wind erosion (e.g. hay bales, silt fencing, rocks, etc).

All excess soil will be temporarily stored in a designated area of the Property. Within reason, the storage location will be in an area away from stormwater impacts and limits unauthorized access to the materials (e.g., away from public roadways/walkways). No regulated soil will be stockpiled on the Property for greater than 60 days without prior Department approval.

In general, all site/earth work materials excavated that seem to pose a risk or threat of leaching contaminated materials based on visual observation, smell or air monitoring (unexpected observation) shall be deposited back in the hole, equipment decontaminated and the work stopped until appropriate management options are determined. In the unlikely event that after stockpiling the excavated material it begins to pose a risk or threat of leaching contaminated materials, replace the polyethylene/plastic liner system with a proper leak-proof container (e.g. lined roll-off) or provide containment around stockpile using booms and/or absorbent pads.

Uncharacterized excavated material shall not be re-used as backfill on commercial/industrial properties until such time that it is demonstrated to the Department, through soil sampling and laboratory analysis that they meet the Department's Method 1 RDEC for all constituents listed in Table 1 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations). Copies of laboratory analysis results shall be maintained by the Property Owner and included in the annual inspection report for the Property, or the Remedial Action Closure Report, as applicable. In the event that the soil does not meet Method 1 RDEC, the material must be properly managed and disposed of off site at a licensed facility.

Uncharacterized excavated material and excess soil generated or excavated to be disposed offsite soils, must be done so at a licensed facility in accordance with all local, state, and federal laws. Copies of the material shipping records associated with the disposal of the material shall be maintained by the Property owner and included in the annual inspection report for the site.

Best soil management practices should be employed at all times and regulated soils should be segregated into separate piles (or cells or containers) as appropriate based upon the results of analytical testing, when multiple reuse options are planned (e.g. reuse on-site or disposal at a Department approved licensed facility).

All non-disposable equipment used during the soil disturbance activities will be properly decontaminated, as appropriate prior to removal from the site. All disposable equipment used during the soil disturbance activities will be properly containerized and disposed of following completion of the work. All vehicles utilized during the work shall be properly decontaminated, as appropriate prior to leaving the site.

At the completion of site work, all exposed soils are required to be recapped with Department approved engineered controls (2 ft of clean fill or equivalent: building foundations, 4 inches of pavement/concrete underlain with 6 inches of clean fill, and/or 1 foot of clean fill underlain with a geotextile liner) or better than the site surface conditions prior to the work that took place. These measures must also be consistent with the Department approved ELUR recorded on the property. Any clean fill material brought on site is required to meet the Department's Method 1 RDEC or be designated by an environmental professional as Non-Jurisdictional under the Remediation Regulations. The Annual Inspection Report for the site, or Remedial Action Closure Report, as applicable should include either analytical sampling results from the fill demonstrating compliance or alternatively include written certification by an Environmental Professional that the fill is Non-Jurisdictional.

Worker Health and Safety

To ensure the health and safety of any on-site workers in the future, persons involved in the excavation and handling of the material on site are required to wear a minimum of Level D personal protection equipment, including gloves, work boots and eye protection. Workers are also required to wash their hands with soap and water prior to eating, drinking, smoking, or leaving the site.

Department Approval

In accordance with Section A iii of the ELUR, no soil at the Property is to be disturbed in any manner without prior written permission of the Department's Office of Waste Management, except for minor inspections, maintenance, and landscaping activities that do not disturb the contaminated soil at the Site. As part of the notification process, the Property owner shall provide a brief written description of the anticipated Property activity involving soil excavation. The Notification should be submitted to the Department no later than 60 days prior to the proposed initiation of the start of site activities. The description shall include an estimate of the volume of soil to be excavated, a list of the known and anticipated contaminants of concern, a site figure clearly identifying the proposed areas to be disturbed or excavated, the duration of the project and the proposed disposal location of the soil.

Following written Notification, the Department will determine the post closure reporting requirements. Significant disturbances of regulated soil will require submission of a Remedial

Closure Report for Department review and approval documenting that the activities were performed in accordance with this PCSMP and the Department approved ELUR. Minor disturbances of regulated soil may be documented through the attached annual certification submitted in accordance with Section H (**Inspection & Non-Compliance**) of the Department approved ELUR. The Department will also make a determination regarding the necessity of performing Public Notice to abutting property owners/tenants concerning the proposed activities. Work associated with the Notification will not commence until written Department approval has been issued. Once Department approval has been issued, the Department will be notified a minimum of two (2) days prior to the start of activities at the site. Shall any significant alterations to the Department approved plan be necessary, a written description of the proposed deviation, will be submitted to the Department for review and approval prior to initiating such changes.

EXHIBIT 3B

RIDEM ELUR ANNUAL COMPLIANCE FORM

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
ENVIRONMENTAL LAND USAGE RESTRICTION (ELUR)
ANNUAL COMPLIANCE SELF-EVALUATION FORM
(Please type or print)

Site Name: _____ Property Owner: _____

RIDEM File No.:_____ Owner Mailing Address: _____

RIDEM Project Manager: _____ _____

ELUR Recording Date: _____ Inspection Date: _____

Owner Telephone Number: _____ E-Mail:_____

This Annual Compliance Self-Evaluation Form is not appropriate for use on sites that require the use of any active remediation systems (e.g. active SSDS, ongoing air or groundwater monitoring, etc.) unless explicit, written permission has been granted by the Department.

1. Site Description

a. Site Address: _____

_____

b. Plat: _____ Lot(s): _____

c. Is the ELUR applicable to the entire site? _____ Yes _____ No

If no, please describe the portion of the property subject to the ELUR: _____

_____

d. What does the ELUR restrict? (Select all that apply)
_____ Residential Uses
_____ Groundwater
_____ Exposure to Site Soils
_____ Infiltration of Water
_____ Subsurface Structures
_____ Other (Please Explain): _____

_____

2. Groundwater

a. Are there any known or observed groundwater wells present? _____ Yes _____ No

b. Are these well(s) used for drinking water? ____ Yes___ No ____ Not Applicable

If no, please state what they are used for (i.e. irrigation, cooling, etc.): _____

_____

c. Are there environmental monitoring wells present? _____ Yes _____ No

3. Engineered Controls (e.g. asphalt, concrete, building foundations, landscaped areas, etc.)

a. Please provide a brief description of the engineered control(s) (e.g. building foundations, one foot of clean fill over a geotextile liner, etc.): _____

_____

_____

_____

_____

_____

b. Overall Condition of Engineered Control(s)

_____ Good _____ Non-compliant

_____ Acceptable _____ Not Applicable (Sites where only groundwater is restricted)

c. Are there any areas on the property that have broken concrete, cracked asphalt, potholes, eroded landscaping, etc.? _____ Yes _____ No

If yes:

Please provide a description of the area(s) of concern: _____

_____

_____

Could water infiltrate through these areas into underlying contaminated soils?

_____ Yes _____ No _____ N/A; Infiltration Not Restricted

When will the area(s) of concern be repaired? _____

_____

d. Has there been any soil disturbance or excavation into the cap (engineered control) in the last year? _____ Yes _____ No

If yes:

How large was the area of disturbance? _____

Please provide the reason or cause for disturbance or excavation: _____

_____

_____

Was this disturbance or excavation approved by the Department?
_____ Yes, Date of Approval: _____ _____ No

Was the Soil Management Plan (SMP) properly followed? _____ Yes_____ No

If no, please explain: _____
_____

_____

Was any soil taken offsite? _____ Yes _____ No

e. Within the past year has there been any construction at the property unauthorized by the department? _____ Yes _____ No
If yes:

Please explain: _____

_____

_____

Did this construction disturb site soils, the existing building or capped surfaces (asphalt, concrete, or landscaped areas)? _____ Yes _____ No

If yes, please specify: _____
_____

_____

f. Have there been any subsurface structures (underground storage tanks, below grade foundations, septic systems, storm water systems, french drains, etc.) constructed or installed since the remediation was completed? _____ Yes_____ No
If yes:

Please Explain: _____
_____

_____

Was permission of the Department's Office of Waste Management obtained?
_____ Yes, Date of Approval: _____ _____ No

g. Condition of landscaped areas
_____ Good _____ Acceptable _____ Non-compliant _____ N/A

h. Does this site effectively limit exposure to contaminated subsurface soil?
_____ Yes _____ No

4. Property Use

a. Are there any residential uses on the property (i.e. houses, apartments or condominiums, etc.) except as previously agreed upon by the Department?_____ Yes _____ No

If yes, please explain: _____
_____
_____

b. Are there any schools, daycare facilities or recreational facilities on the property except as previously agreed upon by the Department? _____ Yes _____ No

If yes, please explain: _____
_____
_____

c. Has the property use changed in anyway since the ELUR was recorded?
_____ Yes _____ No

If yes, please explain: _____
_____
_____

5. Fencing (if applicable)

a. Overall Condition of the Fencing
_____ Good _____ Acceptable _____ Non-Compliant _____ No Fence Required

b. Does the fencing effectively limit the ELUR area? _____ Yes_____ No _____ N/A

6. Overall Assessment

Does this site meet the standard imposed in the ELUR?
_____ Compliant_____ Non-Compliant

7. Observations, comments, and areas of concern

_____
_____
_____
_____
_____
_____
_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

8. Please attach photos that document compliance with the ELUR, potential areas of concern, and the current state of the engineered controls.

Certification of Property Owner

I _____ certify to the best of my knowledge that this Annual Compliance Evaluation Form is a complete and an accurate representation of the site and contains all known facts concerning the Environmental Land Use Restriction imposed on the site.

_____ _____

Signature Owning Company (If applicable)

_____ _____

Printed Name Title

_____

Date

Certification of the Inspector (if different than Owner)

I _____ certify to the best of my knowledge that this Annual Compliance Evaluation Form is a complete and accurate representation of the site and contains all known facts concerning the Environmental Land Use Restriction imposed on the site.

_____ _____

Signature Environmental Company Name

_____ _____

Printed Name Title

_____

Contact Information (If Applicable)

_____ _____

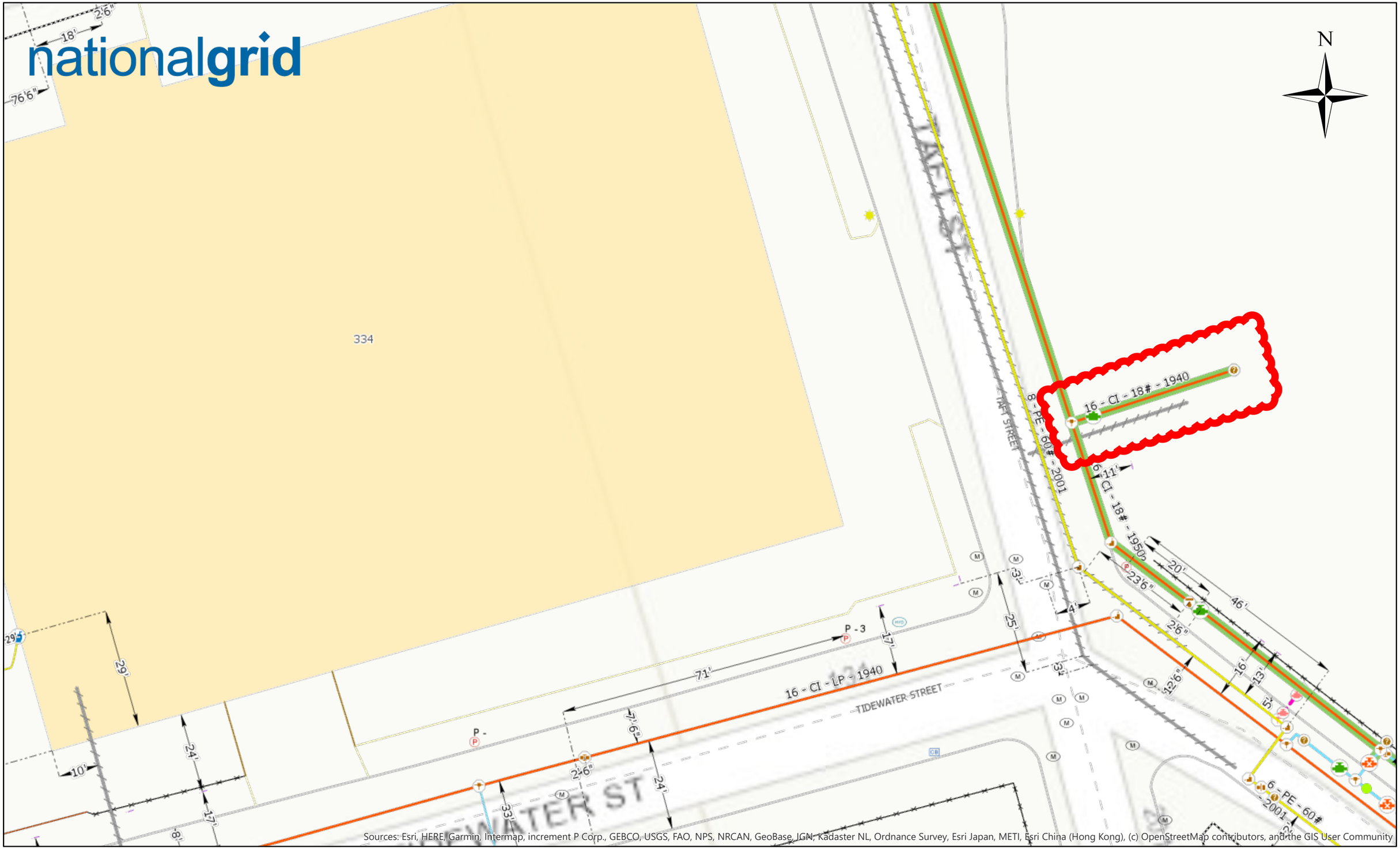
Telephone Number E-Mail Address

APPENDIX C
National Grid Health & Safety Requirements

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D
National Grid Gas and Electric Service Orders

THIS PAGE INTENTIONALLY LEFT BLANK



0 20 40 80 ft

Date Printed: 6/24/2020

GAS PROJECT COST ESTIMATE

Warning!
Be sure to fill in all GREEN cells.
Failure to do so could result in erroneous or missing costs.

All **YELLOW** cells are for data entry

Estimate Level	Level III		
Project Name:	**NBC Phase III CSO - 16" CI Stub Cut-off using stopoff**		
Project Funding Number:(7 char)	**CRCC307**	**GPE ID:**	
Work Order #:(11 char)	**90000xxxxxx**		
Region:	New_England	**Bid Area:**	Cumberland
City:	PAWTUCKET	**Overhead Area:**	Rhode Island
State:	RI	**Date:**(mm/dd/yyyy)	7/17/2020
		Estimated By:	Jim Paulette
Project Type:	Distribution Main outside of ROW	**Project FY**	FY2021
	Length	**Size**	**Material**
New Main:	**0**	**0**	**n/a**
Abandon Main:	**42'**	**16"**	**CI**

Enter Labor Split %	
CAPEX	100%
OPEX	0%
Removal	0%
Total	100%

Number of Services Involved: **0**

Scope of Work: Cost to cut and cap an existing 16" cast iron 18psig main stub at main. Requires TDW Services crew for stop off.

		Direct Costs	Escalator	Contingency	Total Direct Costs	Total Actuals	TOTAL with Actuals	Item
	NG Labor (Mgmt)	$ 1,343.52	$ 98.37	$ 216.28	$ 1,658.17	$0.00	$1,658.17	NG Labor (Mgmt)
	In-House Labor (Union)	$ 5,512.00	$ 412.24	$ 888.64	$ 6,812.87	$0.00	$6,812.87	In-House Labor (Union)
	Total National Grid Labor	**$ 6,855.52**	**$ 510.60**	**$ 1,104.92**	**$ 8,471.04**			
5.00%	NG Transportation-Vehicles	$ 342.78	$ 25.10	$ 55.18	$ 423.05	$0.00	$423.05	NG Transportation-Vehicles
	Stock Materials	$ 6,409.18	$ 479.34	$ 1,033.28	$ 7,921.79	$0.00	$7,921.79	Stock Materials
	Non-Stock Materials	$ 3,979.00	$ 627.19	$ 690.93	$ 5,297.12	$0.00	$5,297.12	Non-Stock Materials
	Total Materials	**$ 10,388.18**	**$ 1,106.53**	**$ 1,724.21**	**$ 13,218.91**			
	Construction Contractor	$ 22,860.37	$ 1,720.55	$ 3,687.14	$ 28,268.05	$0.00	$28,268.05	Construction Contractor
	Restoration Contractor (In-House Construction Applicable)	$ 460.00	$ 43.06	$ 75.46	$ 578.52	$0.00	$578.52	Restoration Contractor (In-House Construction Applicable)
	Police	$ 1,214.40	$ 90.82	$ 195.78	$ 1,501.01	$0.00	$1,501.01	Police
	Permits	$ -	$ -	$ -	$ -	$0.00	$0.00	Permits
	Other (NO COH APPLIED)	$ -	$ -	$ -	$ -	$0.00	$0.00	Other (NO COH APPLIED)
	Total Direct Cost	**$ 42,121.25**	**$ 3,496.66**	**$ 6,842.69**	**$ 52,460.59**			
		Overheads	**Escalator**	**Contingency**	**Total Overheads**	**Total Actual OH's**		
84.80%	Payroll Labor OH - NG Mgmt	$ 1,139.30	$ 83.42	$ 183.41	$ 1,406.13	$0.00	$6,389.75	Payroll Labor OH - NG Mgmt
73.15%	Payroll Labor OH - NG Union	$ 4,032.03	$ 301.55	$ 650.04	$ 4,983.62			Payroll Labor OH - NG Union
23.00%	Material Handling OH - Stock	$ 1,474.11	$ 110.25	$ 237.65	$ 1,822.01	$0.00	$1,822.01	Material Handling OH - Stock
40.00%	**Capital Overheads (COH)**					$0.00	$0.00	**Capital Overheads (COH)**
Applied to	NG Grid Labor (Mgmt)	$ 537.41	$ 39.35	$ 86.51	$ 663.27		$663.27	Capital OH for NG Grid Labor (Mgmt)
	In-House Labor (Union)	$ 2,204.80	$ 164.89	$ 355.45	$ 2,725.15		$2,725.15	Capital OH for In-House Labor (Union)
	NG Transportation-Vehicles	$ 137.11	$ 10.04	$ 22.07	$ 169.22	$0.00	$169.22	Capital OH for NG Transportation-Vehicles
	Stock Materials	$ 2,563.67	$ 191.73	$ 413.31	$ 3,168.72		$3,168.72	Capital OH for Stock Materials
	Non-Stock Materials	$ 1,591.60	$ 250.88	$ 276.37	$ 2,118.85		$2,118.85	Capital OH for Non-Stock Materials
	Construction Contractor	$ 9,144.15	$ 688.22	$ 1,474.86	$ 11,307.22		$11,307.22	Capital OH for Construction Contractor
	Restoration Contractor (In-House Construction Applicable)	$ 184.00	$ 17.23	$ 30.18	$ 231.41		$231.41	Capital OH for Restoration Contractor (In-House Construction Applica
	Police	$ 485.76	$ 36.33	$ 78.31	$ 600.40		$600.40	Capital OH for Police
	Permits	$ -	$ -	$ -	$ -		$0.00	Capital OH for Permits
							$0.00	Capital OH for
	Payroll Labor OH - NG Mgmt	$ 455.72	$ 33.37	$ 73.36	$ 562.45		$562.45	Capital OH for Payroll Labor OH - NG Mgmt
	Payroll Labor OH - NG Union	$ 1,612.81	$ 120.62	$ 260.01	$ 1,993.45		$1,993.45	Capital OH for Payroll Labor OH - NG Union
	Material Handling OH - Stock	$ 589.64	$ 44.10	$ 95.06	$ 728.80		$728.80	Capital OH for Material Handling OH - Stock
						$0.00	$0.00	Sales & Use Tax
	Total Overhead Cost	**$ 26,152.12**	**$ 2,091.96**	**$ 4,236.61**	**$ 32,480.70**	$0.00	$0.00	Supervision & Administration
				AFUDC	**$ 318.53**	$0.00	$318.53	AFUDC
				Subtotal Direct & Overheads	**$ 84,941.29**			
				ACTUALS to date	**$ -**	**$ -**		
	Total Project Estimate				**$ 85,259.82**	$0.00	**$85,259.82**	**Total Checks OK**
	Overall Footage:			**Cost/Foot**	**$ -**			
	Est. Construction Duration:							
	Contingency (%)	15%						
	Equivalent Overall OH (%)	63%						

Additional Work Order Numbers:

Stock Materials

MasterNoun	MaterialShortDesc	MaterialLongDesc	UOM	Material	OldMaterial	Region	RegionalStatus	LOB	MaterialGroup	ProductFamily	ItemType	MaterialTypeDesc	EngineeringStnd	MSnmbr	Price	Quantity	Total Cost
ANODE	ANODE, MAG BAG 17LB	ANODE, 17LB, MAGNESIUM, HI POT, OPEN CKT POT 1.70V MIN, 3IN SQ (NORMAL) CROSS SECT X 25IN L (PLUS/MIN US 1IN)W 10FT SOLID 12 AWG TW (RED) INSUL CU LEAD WIRE IN A CLOTH SACK, 30IN L. MFG/PKGD/SHPD IN ACC ORDANCE W/SPEC 120004-MS, LATEST REV	EA	9311183	4800460	NE	Active	GAS	Anodes	MISC. PIPE MATERIALS	GAS	Stock	1AAC		$ 45.29	2	$90.58
CAP	CAP, LINE VENTED NON-RESTRAIN 17.40IN OD	CAP, LINE, VENTED, NON-RESTRAINING BOLTED, COMPRESSION, FOR 16IN CAST IRON, 17.400IN OD R.S. CAST IRON PIPE, INS ULATED, 7IN L x0.375IN THK MIDDLE RING, EPOXY COATED WITH ANODE CONNECTOR	EA	9384384	00311132	NE	Active	GAS	Pipes & Fittings - Steel			Stock		00311132	$ 608.39	1	$608.39
SLEEVE	SLEEVE, REPAIR INSUL 16IN CTD	SLEEVE, REPAIR, 16IN, INSULATED, NO VENT, STYLE 50A, FOR 17.40IN ODCI, 18-1/4IN FLANGE TO FLANGE CLEARANCE, ALUMI NUM CLAD, EPOXY COATED, WITH 12IN DIA PORTION CENTERED O N TOP HALF OF SLEEVE, MASKED AND UNCOATED, ANODE CONNECT OR, RATED TO 100PSIG	EA	9342323	00364358	NE	Active	GAS	Pipes & Fittings - Steel		GAS	Stock		00364358	$ 5,618.51	1	$5,618.51
TAPE	TAPE, WAX BRN 4INx9IN	TAPE, WAX BROWN 4INx9IN, FOR UNDERGROUND USE, 24 ROLLS T O A CASE, TO BE USED WITH M AND S 00390021	ROL	9341928	00390020	NE	Active	GAS	Leak Detection, Control & Repair Equipment/Materials			Stock		00390020	$ 9.17	10	$91.70

Non-Stock Materials

Quantity	Region	Category	Part	Product Number	Material	Size	Item Description	Diameter Inch	Pressure Class	Estimated Lead Time (Days)	UOM	Unit Price	Total Cost $ 3979
1							12"x16" TDW Shortstop Fitting					$ 3,680.00	$ 3,680.00
1							2" TDW Equalization Fitting					$ 299.00	$ 299.00
													$ -
													$ -
													$ -
													$ -

Traffic Control - New England (Capital Overhead Applied)

Description	Quantity	Unit	Unit Cost	Total Cost	Comments	Work Order
2 person Police Detail - 4 HR		4 Hours	368.00	$0.00		90000xxxxxx
2 person Police Detail- 8 HR	1.5	8 Hours	809.60	$1,214.40		90000xxxxxx
3 person Police Detail- 4 HR		4 Hours	588.00	$0.00		90000xxxxxx
3 person Police Detail - 8 HR		8 Hours	1,293.60	$0.00		90000xxxxxx
Police Cruiser		8 Hours	30.00	$0.00		90000xxxxxx
	Total Traffic Control			**$1,214.40**		

Misc. Contractor Labor/Equip/Charges (Capital Overhead Applied)

Description	Quantity	UOM	Unit Cost	Total Cost $ 22284.35	Comments	Work Order	Escalator	Contingency	Total Direct Costs (w/Escalator & Contingency)	OH/Burden Rates	OH/Burden Costs	OH/Burden Escalator	OH/Burden Contingency	Total OH/Burden Costs	Capital OH Rate	Capital OH (CAD) Costs	Total LOADED Costs
Inspector (welding, construction, etc.)				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Surveyor				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Rail Road Flagger				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Arborist				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Electrical Contractor				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Special Crane & Operator				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Civil Contractor				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Supplier Surveillance Inspector				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Lighting				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Material Sheeting/Pumping				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Contractor Inspector - Non MSA				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Painting				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Security				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Fencing				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Contractor Inspector - MSA				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Engineering Consultant				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
Environmental Consultant				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
TDW Services Crew	1		$ 22,284.35	$ 22,284.35		90000xxxxxx	$1,666.62	$3,592.65	$ 27,543.62					$0	40.00%	$11,017.45	$38,561
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
				$ -		90000xxxxxx	$0.00	$0.00	$ -					$0	40.00%	$0.00	$0
	Total Misc. Contractor Labor			**$22,284.35**			**$1,666.62**	**$3,592.65**	**$27,543.62**		**$0.00**	**$0.00**	**$0.00**	**$0.00**		**$11,017.45**	**$38,561.06**

Other	No Capital Overheads Applied	Quantity	UOM	Unit Price	Total Cost	Comments	Work Order

DIRECTIONS: 1. On **Row 8**, enter % of project spending that will occur in each month of the project. Consider anticipated months for contractor & materials invoices.
2. Make sure Row 8 totals 100% in cell AB8.

Notes: AFUDC will be calculated each month the work order is open plus one additional month.
Project spending could all occur in 1 month or be spread over several months (up to 24). Gaps in spending are premissible.

Rhode Island

Monthly AFUDC Rate:	**0.125%**																									
		Cumulative %	50.00%	75.00%	100.00%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Current Balance	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Total
Enter Projected % Spending / Mo.		25.00%	25.00%	25.00%	25.00%																					100.00%
Projected Monthly Spending		$21,235.32	$21,235.32	$21,235.32	$21,235.32	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$84,941.29
Cumulative Capital Spending	$0.00	$21,235.32	$42,470.65	$63,705.97	$84,941.29	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
AFUDC		$ 13.27	$ 39.82	$ 66.36	$ 92.90	$ 106.18	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 318.53**

TOTAL AFUDC	**$318.53**

Company Name	**Monthly AFUDC Rate**
Boston Gas	0.113%
Essex County Gas	0.113%
Colonial Gas	0.113%
Energy North	0.000%
KeySpan Corporate Svcs	0.000%
KeySpan Generation Svcs - NY	0.000%
KeySpan Energy Delivery - LI	0.568%
KeySpan Energy Delivery - NY	0.125%
Rhode Island	0.125%
Upstate NY	0.566%

Updated July 2016

Allowance for Funds Used During Construction (AFUDC)

A noncash item representing the estimated composite interest costs of debt and return on equity funds used to finance construction. The allowance is capitalized in the property accounts and included in income.

Actual $ Spend to date	**$0.00**
- Actual OPEX$	$0.00
- Actual AFUDC$	$0.00
Starting Actual Capital$	$0.00
Estimated Capital$	**$84,941.29**
TOTAL Capital$	**$84,941.29**

Labor-Union NE

Description	Quantity- Straight Time	UOM	Quantity - OT	UOM	Unit Cost	Total Cost without Escalator $ 5512	Escalator $ 412.24	Total Cost $ 5924.24
Designer		Hour		Hour	$ 42.00	$ -	$ -	$ -
Drafter / CAD Tech		Hour		Hour	$ 42.00	$ -	$ -	$ -
Construction Crew (5-person)	3	Day		Hour	$ 1,624.00	$ 4,872.00	$ 364.37	$ 5,236.37
Construction Crew (4-person)		Day		Hour	$ 1,304.00	$ -	$ -	$ -
Construction Crew (3-person)		Day		Hour	$ 984.00	$ -	$ -	$ -
Construction Crew (2-person)		Day		Hour	$ 664.00	$ -	$ -	$ -
HDD Crew (3-man)		Day		Hour	$ 992.00	$ -	$ -	$ -
HDD Crew (4-man)		Day		Hour	$ 1,312.00	$ -	$ -	$ -
HDD Crew (5-man)		Day		Hour	$ 1,632.00	$ -	$ -	$ -
Tapping/Purging Crew (2-man)		Day		Hour	$ 664.00	$ -	$ -	$ -
I&R Crew (2-man)		Day		Hour	$ 640.00	$ -	$ -	$ -
GEMS		Hour		Hour	$ 40.00	$ -	$ -	$ -
Meter/Service Person		Day		Hour	$ 312.00	$ -	$ -	$ -
Meter/Service Crew (2-person)		Day		Hour	$ 640.00	$ -	$ -	$ -
Meter/Service Crew (3-person)		Day		Hour	$ 952.00	$ -	$ -	$ -
Distribution Mechanic		Day		Hour	$ 328.00	$ -	$ -	$ -
Dump Driver		Day		Hour	$ 320.00	$ -	$ -	$ -
Rack Truck Driver		Day		Hour	$ 328.00	$ -	$ -	$ -
Corrosion Tech		Hour		Hour	$ 40.00	$ -	$ -	$ -
Crane Support Crew		Day		Hour	$ 1,312.00	$ -	$ -	$ -
Welder	16	Hour		Hour	$ 40.00	$ 640.00	$ 47.86	$ 687.86
Welding Inspector		Hour		Hour	$ 41.00	$ -	$ -	$ -
Contractor Inspector		Day		Hour	$ 320.00	$ -	$ -	$ -
NDE Tech		Day		Hour	$ 328.00	$ -	$ -	$ -
Surveyor		Hour		Hour	$ 42.00	$ -	$ -	$ -
Field Trainer		Hour		Hour	$ 42.00	$ -	$ -	$ -

Labor Management

Department	Work Area	Description	Time Type	UOM	Unit #	Hourly Rate	Quantity	Total Cost without Escalator $ 1343.52	Escalator $ 98.37	Total Cost $ 1441.89
GSE Proj Eng & Design	NE	Principal Engineer	Straight Time	per Hour	LM013	$ 55.98	24.0	$ 1,343.52	$ 98.37	$ 1,441.89

Quantity	Region	Bid Area	Contractor Name	Contractor #	RFP REF	Unit Code	Family	Work Description (Maximo Description)	Pipe Diameter inches	Volume Interval	UOM	Unit Price	Total Cost Without: Escalator, Fuel Adj, Night Shift $576.02	Total Escalator $53.93	Total Cost Fuel Adjustment $ 0	Total Cost Night Shift Differential $ 0	Total Cost $ 629.95
8.0	New England	Providence	AGI	1000011878	842	OSFGRCY	Miscellaneous	PROCESSED GRAVEL PER CY	NA	NA	Cubic Yard	$28.65	$229.20	$21.46	$ -	$ -	$ 250.66
8.0	New England	Providence	AGI	1000011878	843	OSFSACY	Miscellaneous	SAND PER CY	NA	NA	Cubic Yard	$29.29	$234.32	$21.94	$ -	$ -	$ 256.26
30.0	New England	Providence	AGI	1000011878	982	OSLSCUT12	T&M	SAWCUT <=12" PER FOOT	NA	NA	Linear Foot	$3.75	$112.50	$10.53	$ -	$ -	$ 123.03

Quantity	Region	Bid Area	Contractor Name	Contractor #	RFP REF	Unit Code	Family	Work Description (Maximo Description)	Pipe Diameter inches	Volume Interval	UOM	Unit Price	Total Cost Without: Escalator, Fuel Adj, Night Shift $460	Total Escalator $43.07	Total Cost Fuel Adjustment $ 0	Total Cost Night Shift Differential $ 0	Total Cost $ 503.07
50.0	New England	Providence	AGI	1000011878	796	OPV09SF	Restoration	ASPHALT RESTORATION 6" TO 9" PER SF	NA	NA	Square Foot	$9.20	$460.00	$43.06	$ -	$ -	$ 503.06

GAS PROJECT COST ESTIMATE

Warning!
Be sure to fill in all GREEN cells.
Failure to do so could result in erroneous or missing costs.

All **YELLOW** cells are for data entry

Estimate Level	Level III		
Project Name:	**NBC Phase III CSO - 16" CI Stub Cut-off**		
Project Funding Number:(7 char)	**CRCC307**	**GPE ID:**	
Work Order #:(11 char)	**90000xxxxxx**		
Region:	New_England	**Bid Area:**	Cumberland
City:	PAWTUCKET	**Overhead Area:**	Rhode Island
State:	RI	**Date:**(mm/dd/yyyy)	7/17/2020
		Estimated By:	Jim Paulette
Project Type:	Distribution Main outside of ROW	**Project FY**	FY2021
	Length	**Size**	**Material**
New Main:	**0**	**0**	**n/a**
Abandon Main:	**42'**	**16"**	**CI**

Enter Labor Split %	
CAPEX	100%
OPEX	0%
Removal	0%
Total	100%
Number of Services Involved:	**0**

Scope of Work: Cost to cut and cap an existing 16" cast iron 18psig main stub at main in Taft St. Estimate requires use of existing valve.

		Direct Costs	Escalator	Contingency	Total Direct Costs	Total Actuals	TOTAL with Actuals	Item
	NG Labor (Mgmt)	$ 1,343.52	$ 98.37	$ 216.28	$ 1,658.17	$0.00	$1,658.17	NG Labor (Mgmt)
	In-House Labor (Union)	$ 5,684.00	$ 425.10	$ 916.36	$ 7,025.46	$0.00	$7,025.46	In-House Labor (Union)
	Total National Grid Labor	**$ 7,027.52**	**$ 523.47**	**$ 1,132.65**	**$ 8,683.64**			
5.00%	NG Transportation-Vehicles	$ 351.38	$ 25.73	$ 56.57	$ 433.67	$0.00	$433.67	NG Transportation-Vehicles
	Stock Materials	$ 1,366.55	$ 102.20	$ 220.31	$ 1,689.07	$0.00	$1,689.07	Stock Materials
	Non-Stock Materials	$ -	$ -	$ -	$ -	$0.00	$0.00	Non-Stock Materials
	Total Materials	**$ 1,366.55**	**$ 102.20**	**$ 220.31**	**$ 1,689.07**			
	Construction Contractor	$ 576.02	$ 53.93	$ 94.49	$ 724.44	$0.00	$724.44	Construction Contractor
	Restoration Contractor (In-House Construction Applicable)	$ 460.00	$ 43.06	$ 75.46	$ 578.52	$0.00	$578.52	Restoration Contractor (In-House Construction Applicable)
	Police	$ 809.60	$ 60.55	$ 130.52	$ 1,000.67	$0.00	$1,000.67	Police
	Permits	$ -	$ -	$ -	$ -	$0.00	$0.00	Permits
	Other (NO COH APPLIED)	$ -	$ -	$ -	$ -	$0.00	$0.00	Other (NO COH APPLIED)
	Total Direct Cost	**$ 10,591.07**	**$ 808.94**	**$ 1,710.00**	**$ 13,110.00**			
		Overheads	**Escalator**	**Contingency**	**Total Overheads**	**Total Actual OH's**		
84.80%	Payroll Labor OH - NG Mgmt	$ 1,139.30	$ 83.42	$ 183.41	$ 1,406.13	$0.00	$6,545.26	Payroll Labor OH - NG Mgmt
73.15%	Payroll Labor OH - NG Union	$ 4,157.85	$ 310.96	$ 670.32	$ 5,139.13			Payroll Labor OH - NG Union
23.00%	Material Handling OH - Stock	$ 314.31	$ 23.51	$ 50.67	$ 388.49	$0.00	$388.49	Material Handling OH - Stock
40.00%	**Capital Overheads (COH)**					$0.00	$0.00	**Capital Overheads (COH)**
Applied to	NG Grid Labor (Mgmt)	$ 537.41	$ 39.35	$ 86.51	$ 663.27		$663.27	Capital OH for NG Grid Labor (Mgmt)
	In-House Labor (Union)	$ 2,273.60	$ 170.04	$ 366.55	$ 2,810.19		$2,810.19	Capital OH for In-House Labor (Union)
	NG Transportation-Vehicles	$ 140.55	$ 10.29	$ 22.63	$ 173.47	$0.00	$173.47	Capital OH for NG Transportation-Vehicles
	Stock Materials	$ 546.62	$ 40.88	$ 88.13	$ 675.63		$675.63	Capital OH for Stock Materials
	Non-Stock Materials	$ -	$ -	$ -	$ -		$0.00	Capital OH for Non-Stock Materials
	Construction Contractor	$ 230.41	$ 21.57	$ 37.80	$ 289.78		$289.78	Capital OH for Construction Contractor
	Restoration Contractor (In-House Construction Applicable)	$ 184.00	$ 17.23	$ 30.18	$ 231.41		$231.41	Capital OH for Restoration Contractor (In-House Construction Applicable)
	Police	$ 323.84	$ 24.22	$ 52.21	$ 400.27		$400.27	Capital OH for Police
	Permits	$ -	$ -	$ -	$ -		$0.00	Capital OH for Permits
							$0.00	Capital OH for
	Payroll Labor OH - NG Mgmt	$ 455.72	$ 33.37	$ 73.36	$ 562.45		$562.45	Capital OH for Payroll Labor OH - NG Mgmt
	Payroll Labor OH - NG Union	$ 1,663.14	$ 124.38	$ 268.13	$ 2,055.65		$2,055.65	Capital OH for Payroll Labor OH - NG Union
	Material Handling OH - Stock	$ 125.72	$ 9.40	$ 20.27	$ 155.39		$155.39	Capital OH for Material Handling OH - Stock
						$0.00	$0.00	Sales & Use Tax
	Total Overhead Cost	**$ 12,092.47**	**$ 908.61**	**$ 1,950.16**	**$ 14,951.24**	$0.00	$0.00	Supervision & Administration
				AFUDC	**$ 105.23**	$0.00	$105.23	AFUDC
				Subtotal Direct & Overheads	**$ 28,061.24**			
				ACTUALS to date	**$ -**	**$ -**		
	Total Project Estimate				**$ 28,166.47**	$0.00	**$28,166.47**	**Total Checks OK**

Overall Footage:		**Cost/Foot**	**$ -**
Est. Construction Duration:			
Contingency (%)	15%		
Equivalent Overall OH (%)	115%		

MasterNoun	MaterialShortDesc	MaterialLongDesc	UOM	Material	OldMaterial	Region	RegionalStatus	LOB	MaterialGroup	ProductFamily	ItemType	MaterialTypeDesc	EngineeringStnd	MSnmbr	Price	Quantity	Total Cost
ANODE	ANODE, MAG BAG 17LB	ANODE, 17LB, MAGNESIUM, HI POT, OPEN CKT POT 1.70V MIN, 3IN SQ (NORMAL) CROSS SECT X 25IN L (PLUS/MIN US 1IN)W 10FT SOLID 12 AWG TW (RED) INSUL CU LEAD WIRE IN A CLOTH SACK, 30IN L. MFG/PKGD/SHPD IN ACC ORDANCE W/SPEC 120004-MS, LATEST REV	EA	9311183	4800460	NE	Active	GAS	Anodes	MISC. PIPE MATERIALS	GAS	Stock	1AAC		$ 45.29	2	$90.58
CAP	CAP, LINE VENTED NON-RESTRAIN 17.40IN OD	CAP, LINE, VENTED, NON-RESTRAINING BOLTED, COMPRESSION, FOR 16IN CAST IRON, 17.400IN OD R.S. CAST IRON PIPE, INS ULATED, 7IN L x0.375IN THK MIDDLE RING, EPOXY COATED WITH ANODE CONNECTOR	EA	9384384	00311132	NE	Active	GAS	Pipes & Fittings - Steel			Stock		00311132	$ 608.39	1	$608.39
FITTING	FITTING, SHORTSTOPP 12IN	FITTING, SHORTSTOPP 12IN, WELD CONTOURED BASE INCLUDES L EAF TYPE COMPLETION PLUG AND BLIND FLANGE	EA	9341086	00333117	NE	Active	GAS	Pipes & Fittings - Steel			Stock		00333117	$ 1,385.70		$0.00
SADDLE	SADDLE, CI SVCE 16INx3IN	SADDLE, 16IN X 3IN	EA	9308282	4803981	NE	Active	GAS	Pipes & Fittings - Steel	MISC. PIPE MATERIALS	GAS	Stock			$ 287.94	2	$575.88
SLEEVE	SLEEVE, REPAIR INSUL 16IN CTD	SLEEVE, REPAIR, 16IN, INSULATED, NO VENT, STYLE 50A, FOR 17.40IN ODCI, 18-1/4IN FLANGE TO FLANGE CLEARANCE, ALUMI NUM CLAD, EPOXY COATED, WITH 12IN DIA PORTION CENTERED O N TOP HALF OF SLEEVE, MASKED AND UNCOATED, ANODE CONNECT OR, RATED TO 100PSIG	EA	9342323	00364358	NE	Active	GAS	Pipes & Fittings - Steel		GAS	Stock		00364358	$ 5,618.51		$0.00
TAPE	TAPE, WAX BRN 4INx9IN	TAPE, WAX BROWN 4INx9IN, FOR UNDERGROUND USE, 24 ROLLS T O A CASE, TO BE USED WITH M AND S 00390021	ROL	9341928	00390020	NE	Active	GAS	Leak Detection, Control & Repair Equipment/Materials			Stock		00390020	$ 9.17	10	$91.70

Traffic Control - New England (Capital Overhead Applied)

Description	Quantity	Unit	Unit Cost	Total Cost	Comments	Work Order
2 person Police Detail - 4 HR		4 Hours	368.00	$0.00		90000xxxxxx
2 person Police Detail- 8 HR	1	8 Hours	809.60	$809.60		90000xxxxxx
3 person Police Detail- 4 HR		4 Hours	588.00	$0.00		90000xxxxxx
3 person Police Detail - 8 HR		8 Hours	1,293.60	$0.00		90000xxxxxx
Police Cruiser		8 Hours	30.00	$0.00		90000xxxxxx
	Total Traffic Control			**$809.60**		

Misc. Contractor Labor/Equip/Charges (Capital Overhead Applied)

DIRECTIONS: 1. On **Row 8**, enter % of project spending that will occur in each month of the project. Consider anticipated months for contractor & materials invoices.
2. Make sure Row 8 totals 100% in cell AB8.

Notes: AFUDC will be calculated each month the work order is open plus one additional month.
Project spending could all occur in 1 month or be spread over several months (up to 24). Gaps in spending are premissible.

Rhode Island

Monthly AFUDC Rate:	**0.125%**																									
		Cumulative %	50.00%	75.00%	100.00% -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Current Balance	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Total
Enter Projected % Spending / Mo.		25.00%	25.00%	25.00%	25.00%																					100.00%
Projected Monthly Spending		$7,015.31	$7,015.31	$7,015.31	$7,015.31	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$28,061.24
Cumulative Capital Spending	$0.00	$7,015.31	$14,030.62	$21,045.93	$28,061.24	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
AFUDC		$ 4.38	$ 13.15	$ 21.92	$ 30.69	$ 35.08	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 105.23**

TOTAL AFUDC	**$105.23**

Company Name	**Monthly AFUDC Rate**
Boston Gas	0.113%
Essex County Gas	0.113%
Colonial Gas	0.113%
Energy North	0.000%
KeySpan Corporate Svcs	0.000%
KeySpan Generation Svcs - NY	0.000%
KeySpan Energy Delivery - LI	0.568%
KeySpan Energy Delivery - NY	0.125%
Rhode Island	0.125%
Upstate NY	0.566%

Updated July 2016

Allowance for Funds Used During Construction (AFUDC)

A noncash item representing the estimated composite interest costs of debt and return on equity funds used to finance construction. The allowance is capitalized in the property accounts and included in income.

Actual $ Spend to date	**$0.00**
- Actual OPEX$	$0.00
- Actual AFUDC$	$0.00
Starting Actual Capital$	$0.00
Estimated Capital$	**$28,061.24**
TOTAL Capital$	**$28,061.24**

Labor-Union NE

Description	Quantity- Straight Time	UOM	Quantity - OT	UOM	Unit Cost	Total Cost without Escalator $ 5684	Escalator $ 425.1	Total Cost $ 6109.1	Comments
Designer		Hour		Hour	$ 42.00	$ -	$ -	$ -	
Drafter / CAD Tech		Hour		Hour	$ 42.00	$ -	$ -	$ -	
Construction Crew (5-person)	2	Day	8	Hour	$ 1,624.00	$ 5,684.00	$ 425.10	$ 6,109.10	
Construction Crew (4-person)		Day		Hour	$ 1,304.00	$ -	$ -	$ -	
Construction Crew (3-person)		Day		Hour	$ 984.00	$ -	$ -	$ -	
Construction Crew (2-person)		Day		Hour	$ 664.00	$ -	$ -	$ -	
HDD Crew (3-man)		Day		Hour	$ 992.00	$ -	$ -	$ -	
HDD Crew (4-man)		Day		Hour	$ 1,312.00	$ -	$ -	$ -	
HDD Crew (5-man)		Day		Hour	$ 1,632.00	$ -	$ -	$ -	
Tapping/Purging Crew (2-man)		Day		Hour	$ 664.00	$ -	$ -	$ -	
I&R Crew (2-man)		Day		Hour	$ 640.00	$ -	$ -	$ -	
GEMS		Hour		Hour	$ 40.00	$ -	$ -	$ -	
Meter/Service Person		Day		Hour	$ 312.00	$ -	$ -	$ -	
Meter/Service Crew (2-person)		Day		Hour	$ 640.00	$ -	$ -	$ -	
Meter/Service Crew (3-person)		Day		Hour	$ 952.00	$ -	$ -	$ -	
Distribution Mechanic		Day		Hour	$ 328.00	$ -	$ -	$ -	
Dump Driver		Day		Hour	$ 320.00	$ -	$ -	$ -	
Rack Truck Driver		Day		Hour	$ 328.00	$ -	$ -	$ -	
Corrosion Tech		Hour		Hour	$ 40.00	$ -	$ -	$ -	
Crane Support Crew		Day		Hour	$ 1,312.00	$ -	$ -	$ -	
Welder		Hour		Hour	$ 40.00	$ -	$ -	$ -	
Welding Inspector		Hour		Hour	$ 41.00	$ -	$ -	$ -	
Contractor Inspector		Day		Hour	$ 320.00	$ -	$ -	$ -	
NDE Tech		Day		Hour	$ 328.00	$ -	$ -	$ -	
Surveyor		Hour		Hour	$ 42.00	$ -	$ -	$ -	
Field Trainer		Hour		Hour	$ 42.00	$ -	$ -	$ -	

Labor Management

Department	Work Area	Description	Time Type	UOM	Unit #	Hourly Rate	Quantity	Total Cost without Escalator $ 1343.52	Escalator $ 98.37	Total Cost $ 1441.89
GSE Proj Eng & Design	NE	Principal Engineer	Straight Time	per Hour	LM013	$ 55.98	24.0	$ 1,343.52	$ 98.37	$ 1,441.89

Quantity	Region	Bid Area	Contractor Name	Contractor #	RFP REF	Unit Code	Family	Work Description (Maximo Description)	Pipe Diameter inches	Volume Interval	UOM	Unit Price	Total Cost Without: Escalator, Fuel Adj, Night Shift $576.02	Total Escalator $53.93	Total Cost Fuel Adjustment $ 0	Total Cost Night Shift Differential $ 0	Total Cost $ 629.95
8.0	New England	Providence	AGI	1000011878	842	OSFGRCY	Miscellaneous	PROCESSED GRAVEL PER CY	NA	NA	Cubic Yard	$28.65	$229.20	$21.46	$ -	$ -	$ 250.66
8.0	New England	Providence	AGI	1000011878	843	OSFSACY	Miscellaneous	SAND PER CY	NA	NA	Cubic Yard	$29.29	$234.32	$21.94	$ -	$ -	$ 256.26
30.0	New England	Providence	AGI	1000011878	982	OSLSCUT12	T&M	SAWCUT <=12" PER FOOT	NA	NA	Linear Foot	$3.75	$112.50	$10.53	$ -	$ -	$ 123.03

Quantity	Region	Bid Area	Contractor Name	Contractor #	RFP REF	Unit Code	Family	Work Description (Maximo Description)	Pipe Diameter inches	Volume Interval	UOM	Unit Price	Total Cost Without: Escalator, Fuel Adj, Night Shift $460	Total Escalator $43.07	Total Cost Fuel Adjustment $ 0	Total Cost Night Shift Differential $ 0	Total Cost $ 503.07
50.0	New England	Providence	AGI	1000011878	796	OPV09SF	Restoration	ASPHALT RESTORATION 6" TO 9" PER SF	NA	NA	Square Foot	$9.20	$460.00	$43.06	$ -	$ -	$ 503.06

nationalgrid

January 12, 2021

Kathryn Kelly
Narragansett Bay Commission
1 Service Road
Providence, RI 02905

Re: Electric Service Proposal:

Enclosed please find an Electric Service Proposal for crib cuts to de-energize secondary lines and reconnects of the same at Taft Street

If this Proposal is acceptable, please sign and return the enclosed copy of the Service Agreement. Upon receipt of your acceptance, you will then be billed under separate cover in the amount of $2,435.27 including applicable taxes. This price is valid for 90 days.

This work will be scheduled upon receipt of this signed Service Agreement, payment of invoice, and completion of all responsibilities as outlined in the attached proposal.

Should you have any questions, please contact me 401-784-4358.

Sincerely,

Thomas Bellrose
Complex Commercial Acct Rep
National Grid
280 Melrose St
Providence, RI 02907

ELECTRIC SERVICE PROPOSAL

Kathryn Kelly
Narragansett Bay Commission
1 Service Road
Providence, RI 02905

Service Request:	30281741, 30300146, 30313020 & 30313021
Drawings:	
Electrical Contractor:	
Customer's Contribution:	$2,435.27
Billing Party:	Narragansett Bay Commission
Customer's Responsibilities:	► Return signed Service Agreement, if accepted. ► Provide all necessary right-of-way easements ► Notify National Grid if any changes in the Billing Party will occur. ► Payment in full, upon receipt of the invoice.
National Grid Responsibilities:	Temporary secondary crib cuts at Pole 1 Merry Street and pole 1 Spencer Street and reconnects at a later date. WR# 30281741 crib cut at pole1 Spencer Street WR# 30300146 close crib at Pole1 Spencer Street WR# 30313020 crib cut at Pole1 Merry Street WR# 30313021 close crib at Pole1 Merry Street
Construction Lead Time:	Approximately 2-4 weeks will be necessary for construction. Upon receipt of payments, permits, right-of-way and the signed Proposal, this project will be added to National Grid's construction schedule. **Note: Payment must be made upon receipt of the invoice. The correct mailing address for payments will be listed on the invoice.**
Remarks:	This proposal is based upon projected cost and rate schedule provisions in effect at the date of this proposal and will be withdrawn if not accepted within 90 days of the date of this Proposal. This proposal and all attached documentation is proprietary property of National Grid and can only be used for its intended purpose crib cuts to de-energize secondary lines and reconnects of the same, at Taft Street and shall not be otherwise disclosed.
Prepared By:	Thomas Bellrose Complex Commercial Acct Rep 401-784-4358

Narragansett Electric Company, dba National Grid
Miscellaneous Construction

Quote Date : January 12, 2021
Name of Complex:
Service Address: Taft Street
Pawtucket, RI 02860

Contact Name: Kathryn Kelly
Company Name: Narragansett Bay Commission
Mailing Address: 1 Service Road
Providence, RI 02905

National Grid Representative: Thomas Bellrose Work Req. # 30281741

Miscellaneous Construction

Temporary secondary crib cuts at Pole 1 Merry Street and pole 1 Spencer Street with reconnects at a later date.
WR# 30281741 crib cut at pole1 Spencer Street
WR# 30300146 close crib at Pole1 Spencer Street

WR# 30313020 crib cut at Pole1 Merry Street
WR# 30313021 close crib at Pole1 Merry Street

Cost

The cost of this service, as requested by the customer, is: $2,435.27 This cost is non-refundable.

Cost Estimates

All cost estimates stated in this agreement are time sensitive and based on the execution date of this agreement. If construction has not commenced within 180 days of the execution date of this agreement and/or a wire inspection has not been completed within 360 days of the execution date of this agreement, National Grid reserves the right to require a new agreement that reflects the policies and costs in effect at that time.

Specifics:

Rate: N/A
Delivery: N/A
Maximum Intake: N/A
Special Conditions:

I agree to the terms set forth in the Agreement:
Narragansett Bay Commission

Name: **Kathryn Kelly**

Title: _____

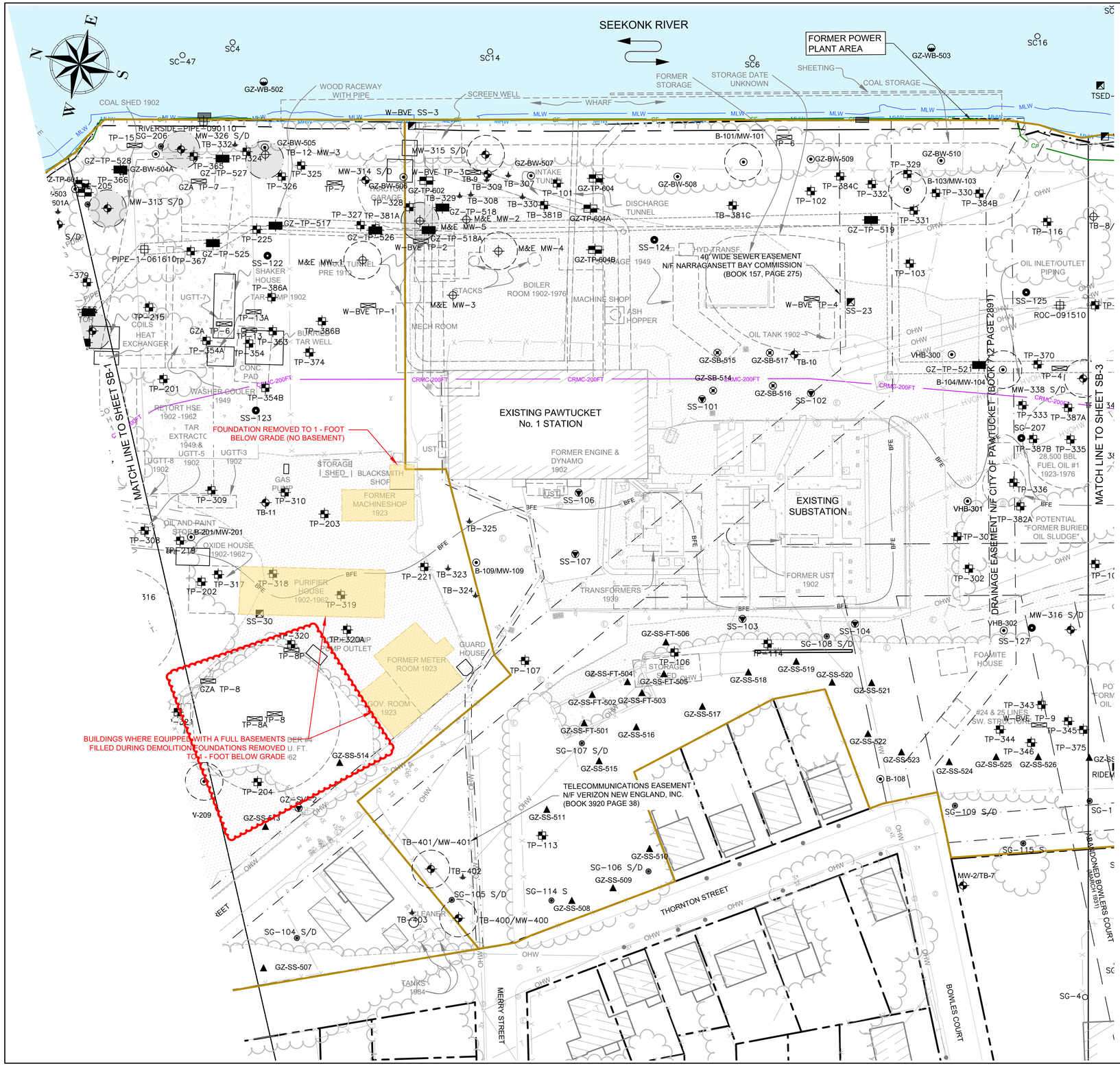
Date: _____

_____
Customer Signature

APPENDIX E

Test Pit Information for Tank Holder #4 on Tidewater Property

THIS PAGE INTENTIONALLY LEFT BLANK



SAMPLE LEGEND

SS-9	ATLANTIC SURFACE SOIL SAMPLE LOCATION
TSED-6	ATLANTIC SEDIMENT SAMPLE LOCATION
W-BVE SS-3	WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
RIDEM SS-3	RIDEM SURFACE SOIL SAMPLE LOCATION
B-109/ MW-109	MONITORING WELL/BORING (VHB) SURVEYED
TP-3A	ATLANTIC TEST PIT LOCATION
W-BVE	WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
GZA TP-8	GZA/VALLEY GAS TEST PIT LOCATION
TB-15	ATLANTIC SOIL BORING LOCATION
MW-3	ATLANTIC MONITORING WELL LOCATION
M&E MW-1	METCALF & EDDY MONITORING WELL LOCATION
VHB-400	VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
TP-204	VHB TEST PIT (2006)
GZ-01	GZA TEST PIT (2009)
TB-300	GZA TEST BORING LOCATION (2010-2011)
MW-320 S/D	GZA MONITORING WELL LOCATION (2010-2011)
TP-306	GZA TEST PIT LOCATION (2010)
SS-100	GZA SURFACE SOIL SAMPLE LOCATION (2010)
SC31	ARCADIS SEDIMENT SAMPLE LOCATION (2008)
PIPE-1-061610	GZA RESIDUAL MATERIAL SAMPLE (2010)
SG-200	INTERIOR SOIL GAS SAMPLING LOCATION
SG-100	PERIMETER SOIL GAS SAMPLING LOCATION
TB-400	GZA BORING LOCATION (2014)
MW-400	GZA MONITORING WELL LOCATION (2014)
MW-01	F & O MONITORING WELL LOCATION (2011-2012)
SB-08	F & O SOIL BORING LOCATION (2011-2012)
SS-01	F & O SURFACE SOIL SAMPLE LOCATION (2011-2012)
SB-101	F & O PRE-DISPOSAL SOIL CHARACTERIZATION SAMPLE LOCATION (2011-2012)
TP-4	ERA TEST PIT LOCATION (1988)
ERA-2	ERA MONITORING WELL LOCATION (1988)
GZ-TP-519	GZA TEST PIT LOCATION (2017)
GZ-SS-518	GZA SURFACE SOIL SAMPLE LOCATION (2017)
GZ-SS-FT-502	GZA SURFACE SOIL SAMPLE LOCATION (FORMER TRANSFORMER AREA) (2017)
GZ-BK-501	GZA SOIL BORING LOCATION (2017)
GZ-BW-507	GZA SOIL BORING LOCATION (2017)
GZ-SB-515	GZA SOIL BORING LOCATION (2017)
GZ-SV-1	GZA SOIL VAC LOCATION (2017)
GZ-WB-501	GZA WATER BORING LOCATION (2017)
GZ-CS-501	GZA CONCRETE SAMPLE LOCATION (2017)
GZ-TP-601	GZA TEST PIT LOCATION (2019)
	LNAPL DETECTED IN (2017)
	DNAPL DETECTED IN (2017)
	WELL TO BE ABANDONED AS PART OF REMEDY

LEGEND:

- WETLAND LINE
- BUILDING
- CONCRETE SURFACE
- FENCE
- GRAVEL SURFACE
- BITUMINOUS PAVEMENT
- RETAINING WALL
- TREE LINE
- PROPERTY LINE
- EASEMENT LINE
- ABANDONED STREET LINE
- MHW — MEAN HIGH WATER LINE
- MLW — MEAN LOW WATER LINE
- CRMC-200FT — 200 FOOT CRMC JURISDICTION LINE
- CF — COASTAL FEATURE LINE
- HIGH TIDE ELEVATION
- SITE BOUNDARY

0 20 20 80 120
SCALE IN FEET 1" = 40'

PERMITTING SET
NOT FOR CONSTRUCTION

NO.	ISSUE/DESCRIPTION	BY	DATE

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

FORMER TIDEWATER FACILITY
PAWTUCKET, RHODE ISLAND
PERMIT SET

EXPLORATION LOCATION PLAN (2 OF 3)

P.E. STAMP:

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
nationalgrid

PROJ MGR: DJR	REVIEWED BY: MJP	CHECKED BY: DJR	DRAWING SB-2
DESIGNED BY: ----	DRAWN BY: SAB	SCALE: AS SHOWN	
DATE: AUGUST 2019	PROJECT NO. 43654.40	REVISION NO.	SHEET NO. 5 OF 51

GZA-J:\ENV\43654.40\CAD\01_CURRENT\PLANS\EXP-PLANS FOR NBC-BETA\43.645.40_PERMIT-SB-01-03-EXP.DWG 5 EXPLORATION LOCATION PLAN (2 OF 3) OCTOBER 2, 2019 11:58AM SCOTT BUXTON

TEST PIT FIELD LOG

GOLDBERG · ZOINO & ASSOC., INC GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT DESCRIPTION Valley Gas Company LOCATION Pawtucket, R.I.	TEST PIT No. 8 FILE No. C-6873 DATE 11-14-86

GZA ENGINEER G. Gardner
WEATHER Sunny, 30's

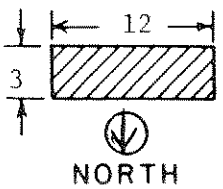
EXCAVATION EQUIPMENT
CONTRACTOR John Ferri & Sons
OPERATOR
MAKE MODEL
CAPACITY cu.yd. REACH 15 ft.

GROUND ELEV.
TIME STARTED
TIME COMPLETED

DEPTH		SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
0					
1'	4'±	Brown, coarse to fine SAND, little(+) Gravel, bricks (Apparent FILL)	M		1.
2'			M		2.
3'			M		
4'			M		
5'		Bottom of Exploration			
6'					
7'					
8'					
9'					
10'		(Water inside tank is discolored, strong odor emanating from apparent fill material and water)			
11'					
12'					
13'					
14'					

REMARKS:
1. Test pit located in fill material of previously located No. 4 Holder.
2. Apparent surface water trapped within brick subsurface structure of the No. 4 Holder.

TEST PIT PLAN



VOLUME = _____ cu.yd.

LEGEND:

BOULDER COUNT

SIZE RANGE CLASSIFICATION	LETTER DESIGNATION
6" - 18"	A
18" - 36"	B
36" AND LARGER	C

PROPORTIONS USED

TRACE (TR)	0 - 10%
LITTLE (LI)	10 - 20%
SOME (SO)	20 - 35%
AND	35 - 50%

ABBREVIATIONS
F - FINE
M - MEDIUM
C - COARSE
F/M - FINE TO MEDIUM
F/C - FINE TO COARSE
V - VERY
GR. - GRAY
BN. - BROWN
YEL. - YELLOW

EXCAVATION EFFORT
E — EASY
M — MODERATE
D — DIFFICULT

GROUNDWATER
ELAPSED TIME TO READING (HRS.) ② G.W.L.

ATLANTIC
ENVIRONMENTAL SERVICES, INC.

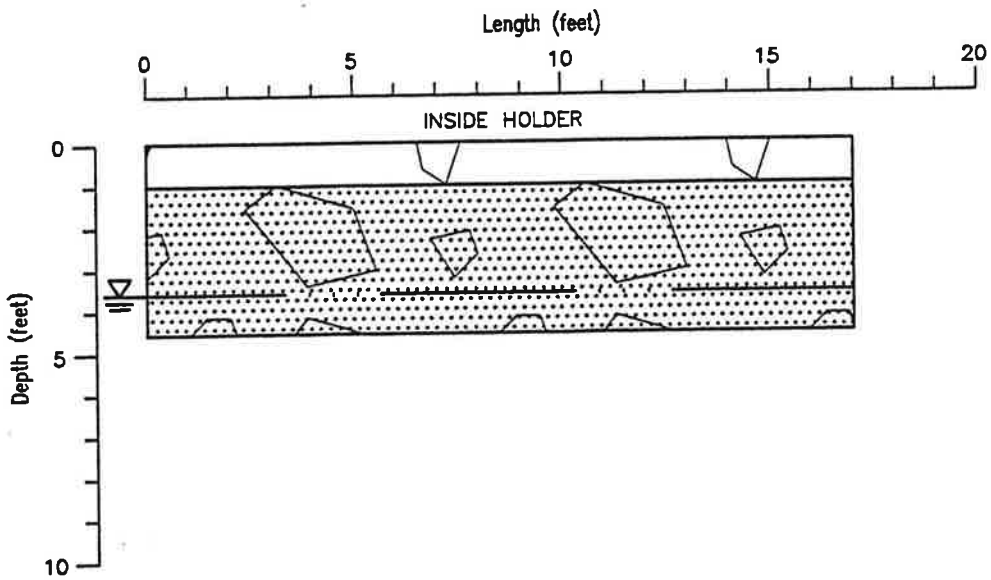
ATLANTIC FORM: 1031
REVISION DATE: _____

COLCHESTER, CT.

TEST PIT DESCRIPTION SHEET

PROJECT NUMBER: 2061-03-02
TEST PIT NUMBER: TP-8/TP-8A
GENERAL LOCATION AND/OR PURPOSE: RELIEF HOLDER #4 CENTER/NORTHWEST SIDE
DATE: JULY 10, 1996
TIME OPENED: 7:40 AM TIME CLOSED: 10:00 AM

LOCAL "CALL BEFORE YOU DIG" CASE NO.: -
OBSERVER: DEAN GUSTAFSON
ASSISTANT: -
OTHERS: -
OPERATOR: BOB PRENTISS
EQUIPMENT: CAT 416B BACKHOE



SOIL DESCRIPTION

0-1' BROWN MEDIUM-COARSE SAND, BRICK RUBBLE, STONE, CONCRETE, STEEL (2-3" DIA.) PIPING.

1-4.5' BLACK STAINED SOIL, RUBBLE, WOOD, PIPING. STRONG COAL TAR/NAPHTHA ODOR.

VIDEO DOCUMENTED: YES X NO ____
PHOTOGRAPHED: YES ____ NO X
TOTAL DEPTH: 4.5 FT.
TOTAL LENGTH: 17/8 FT.

DEPTH TO WATER: 3.6 FT.
NAPL SEEPAGE: YES ____ NO X
SAMPLE ID: NONE

ATLANTIC
ENVIRONMENTAL SERVICES, INC.

ATLANTIC FORM: 1031
REVISION DATE: _____

COLCHESTER, CT.

TEST PIT DESCRIPTION SHEET

PROJECT NUMBER: 2061-03-02
TEST PIT NUMBER: TP-8B
GENERAL LOCATION AND/OR PURPOSE: NORTHEAST OUTSIDE WALL OF RELIEF HOLDER #4
DATE: JULY 10, 1996
TIME OPENED: 8:55 AM TIME CLOSED: 9:43 AM

LOCAL "CALL BEFORE YOU DIG" CASE NO.: -
OBSERVER: DEAN GUSTAFSON
ASSISTANT: -
OTHERS: -
OPERATOR: BOB PRENTISS
EQUIPMENT: CAT 416B BACKHOE

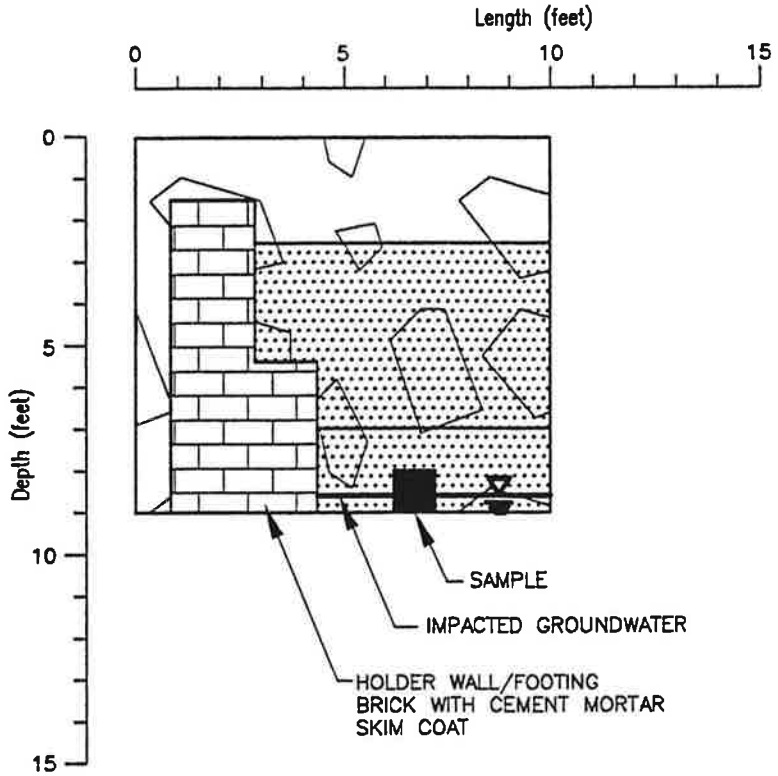
SOIL DESCRIPTION

0-2.5' SOIL, RUBBLE, COAL ASH/CINDERS, BRICK. RELATIVELY CLEAN.

2.5-7' HEAVILY IMPACTED BLACK STAINED SOIL, BRICK RUBBLE. STRONG TAR ODOR.

7-9' SATURATED SOIL, HEAVY SHEEN. VERY STRONG TAR ODOR. GROUNDWATER SEEPING INTO EXCAVATION AT 8.5'. CANNOT GO DEEPER.

NOTE: TARRY SHEEN AND STAINING ON GROUNDWATER SURFACE.



VIDEO DOCUMENTED: YES X NO _____
PHOTOGRAPHED: YES _____ NO X
TOTAL DEPTH: 8.5 FT.
TOTAL LENGTH: 10 FT.

DEPTH TO WATER: 8.5± FT.
NAPL SEEPAGE: YES X NO _____
SAMPLE ID: TTP-8B (8-9')

VHB Vanasse Hangen Brustlin, Inc.

Test Pit Log: **TP-204**

Project:	Tidewater	**Date:**	4/26/06
Test Pit Location:	200 Taft Street	**Ground Surface Elevation:**	21.9 ft.
Equipment Used:	John Deere 410 Backhoe	**Contractor:**	Clean Harbors Environmental Services
Test Pit Dimension (LxWxD):	6 ft.x3 ft.x4 ft.	**Logged By:**	CM
Project No.:	71522	**Depth to Water:**	Not Encountered

DEPTH (feet)	Sample No.	Sample	Excavation Effort	OVM Reading	Description: strata thickness, color, texture, moisture, observations		Remarks
0							
1							
2			E/M		Lt Olive Br vf/c sand and stones, cobbles, asphalt, brick (demolition debris)		Due to proximity to 30-inch gas main, stopped excavation at 4 feet
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							

TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. 530 BROADWAY, PROVIDENCE, RI GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT DESCRIPTION: Former Tidewater Facility LOCATION: Pawtucket, Rhode Island	TEST PIT NO.: TP-320 FILE NO.: 43654.00 DATE: 6-3-10

EXCAVATION EQUIPMENT

GZA ENGINEER: Sean Connolly
WEATHER:

CONTRACTOR: T-Ford
OPERATOR: Todd Mandella
MAKE: Komatsu
CAPACITY: ± 3 cu. Yds.

MODEL: PC220LC
REACH: ±17 feet

DATUM: NGVD 1929
GROUND ELEV.: 16.09
TIME STARTED: 09:50
TIME COMPLETED: 10:30

DEPTH (ft)	ELEVATION (ft)	Field Testing (ppmv)	SOIL DESCRIPTION (SW – NE)	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
1	15.09	0.3	Brown (10yr 5/3) fine to coarse SAND, some fine to coarse Gravel, little Organics, little Brick (Dry)	M	0	4
2	14.09		Possible Bedrock	M/D	1A	2/3
3	13.09			M/D	2A	
4	12.09	67.6	Black (10yr 2.5/1) fine to coarse SAND, some fine to coarse Gravel, little Coal-like Fragments, little Rock, strong coal tar-like odor, coated-saturated. (Moist-Wet)	M/D	3A	
5	11.09			M/D	3A	1
6	10.09	197		M/D	3A	
7			Refusal @ ± 6' bgs			
8						
9						
10						
11						
12						
13						
14						

REMARKS:

1. GW moderately weeping @ ± 5' bgs in the SW corner of the test pit. Water has coal tar-like impacts.
2. Brick wall in the SW wall of the test pit.
3. Possible bedrock depicted above.
4. Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million/volume air (ppmv) relative to benzene in air and above the background readings. All samples are photo documented. ND=None Detected above background.

TEST PIT PLAN

15

3

NORTH

VOLUME= 5 cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED	
TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT	
E	EASY
M	MODERATE
D	DIFFICULT

OBSERVED GROUNDWATER LEVEL

APPENDIX F

National Grid's specifications, guidance and policies for working near and around gas utilities

THIS PAGE INTENTIONALLY LEFT BLANK

Cast Iron Gas Main Encroachment Prevention

nationalgrid

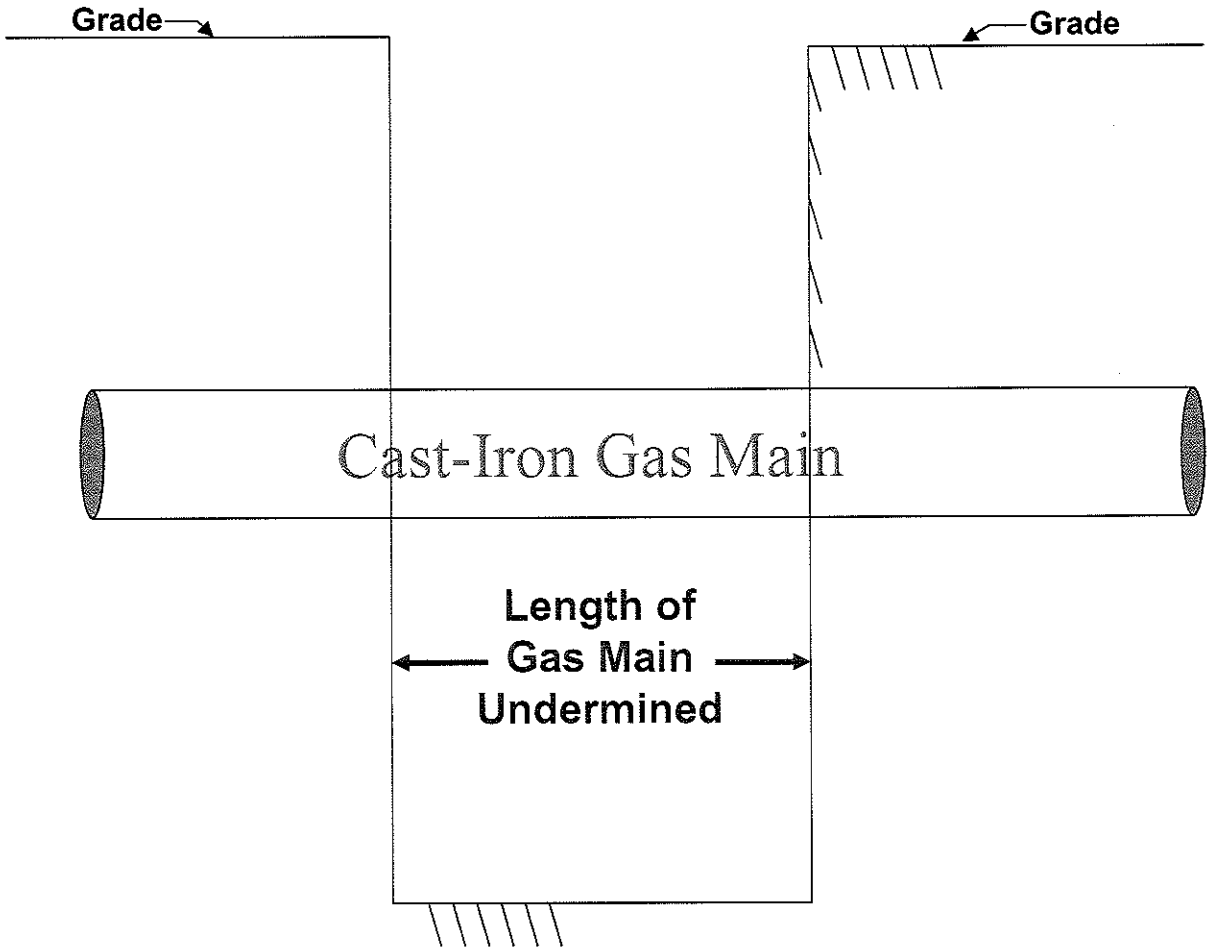
Chris Ferranti
Lead Engineer
Gas Operations & Construction
Rhode Island
Cell: 401-465-9064
chris.ferranti@nationalgrid.com

477 Dexter Street
Providence, RI 02863

CI Encroachments

- CI Encroachments can occur when excavating under or next to CI gas mains
- CI Encroachments can occur **Even when a gas main is not exposed**
- Two types of Encroachments: Undermine and Parallel
  - **Undermine Encroachments (Cross Trench)**
  - **Parallel Encroachments**

Cross Trench

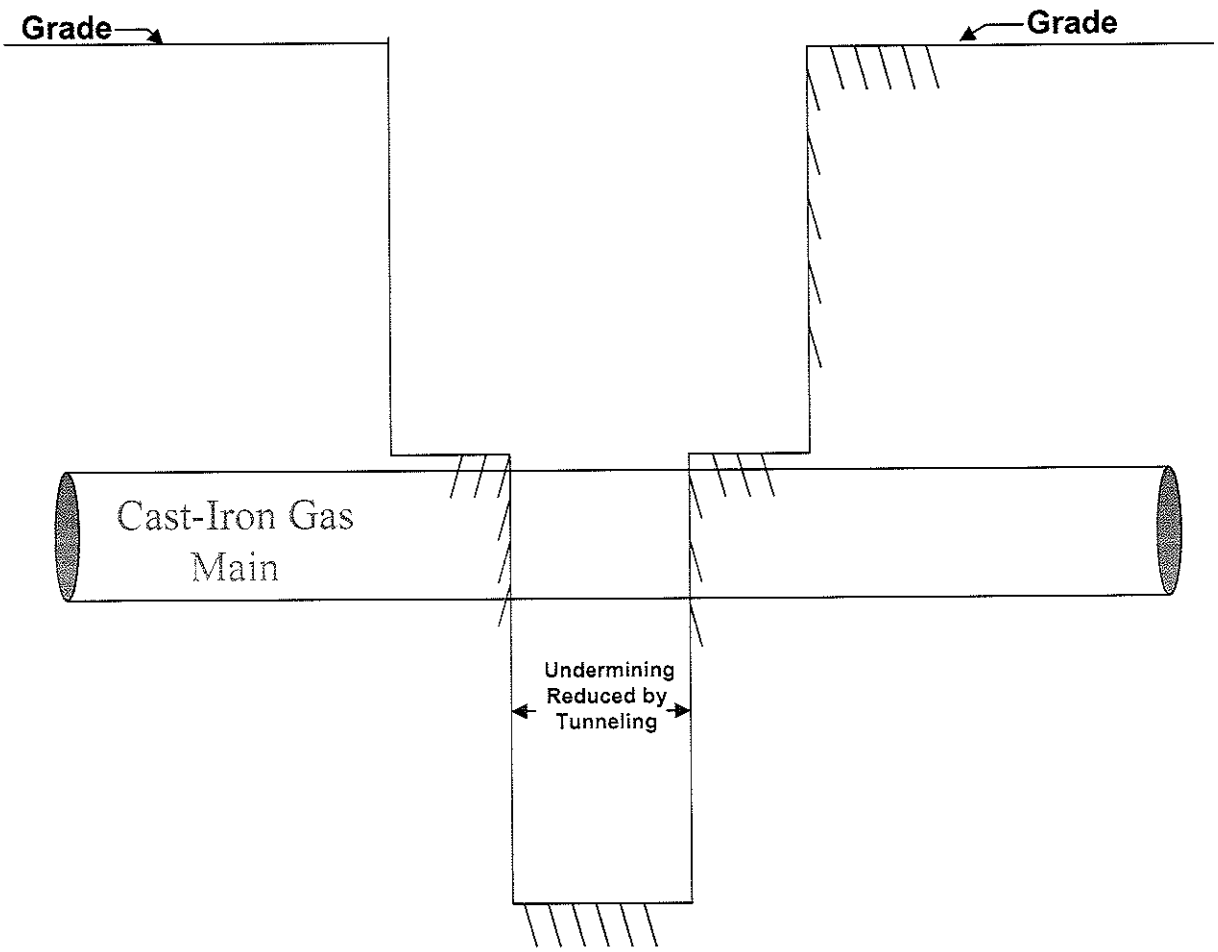


Elevation View

Cross Trench - Rules of Thumb:

- The shorter the undermine, the better
- Limiting the length of the undermine to 30" or less will always avoid an encroachment

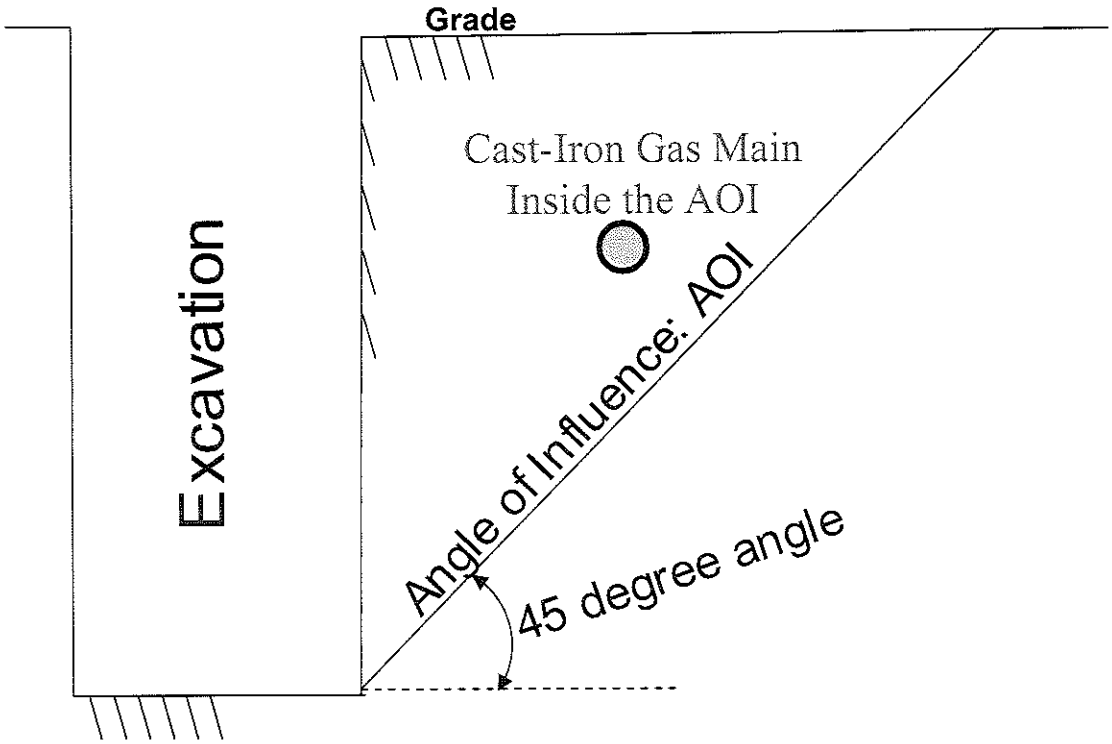
Cross Trench with Tunneling



Elevation View

Tunneling is an Effective Way of Preventing Encroachments

Cast Iron Encroachments
can occur even when the
Gas Main is not Exposed

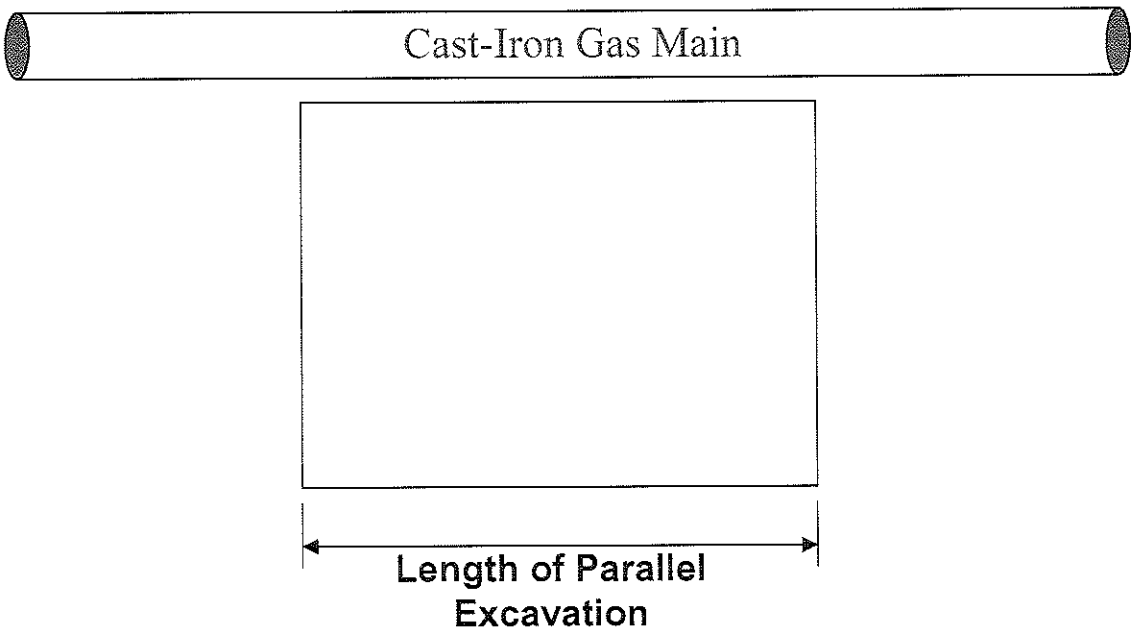


Angle of Influence:

- **The AOI extends up from the bottom of the excavation at a 45 degree angle**
- **The AOI can affect cast iron gas mains even if the gas main is not exposed**

Excavation Next to Gas Main

(view from above looking down)

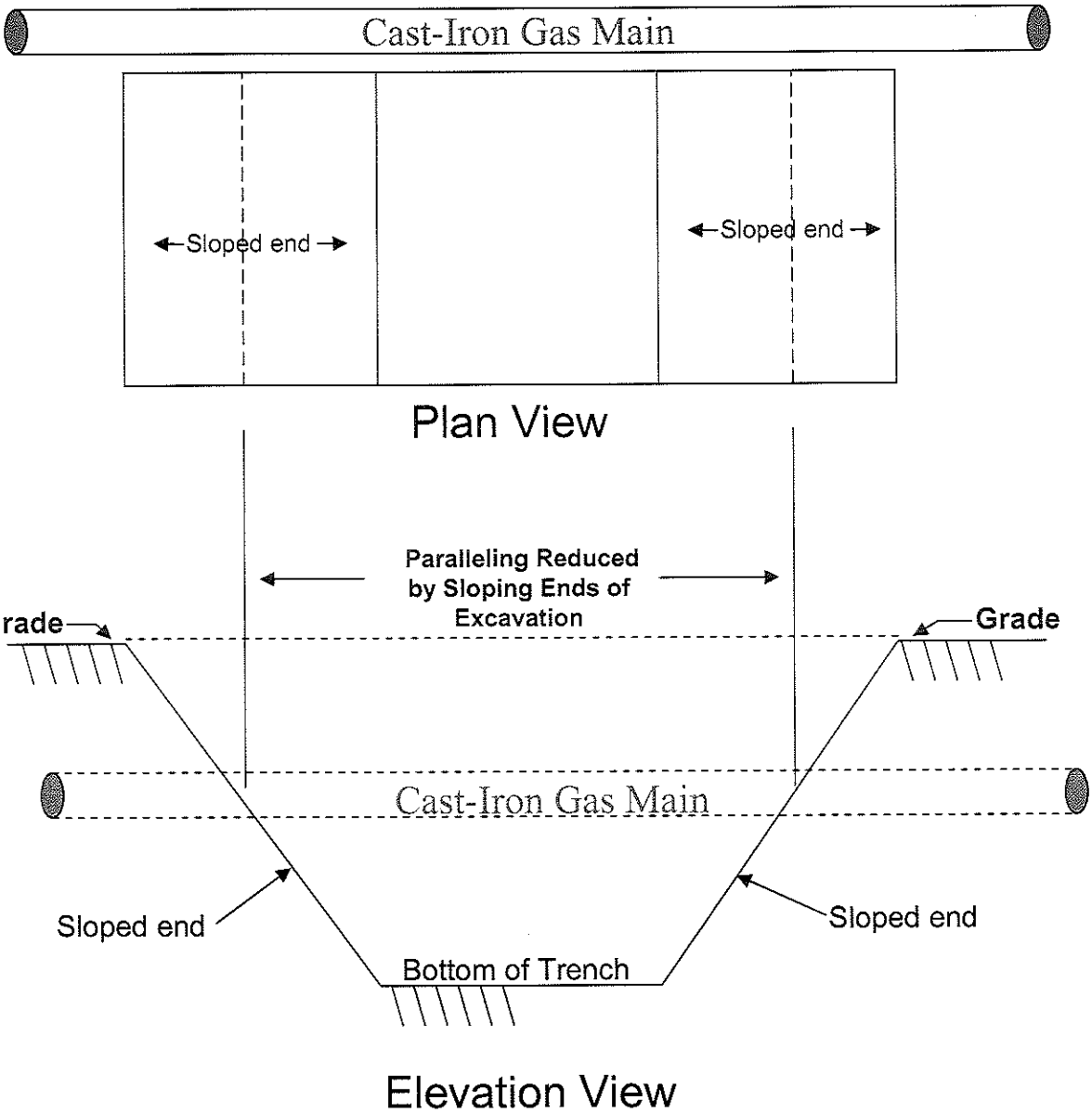


Plan View

Parallel Excavation Rule of Thumb:

- **Limiting the length of the parallel to 7'-6" or less will always avoid an encroachment**

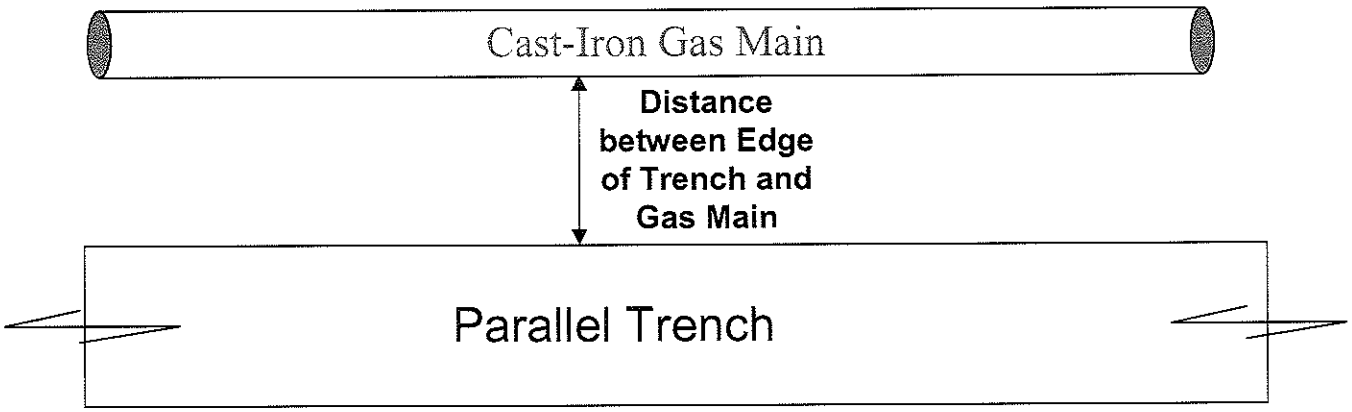
Parallel Excavation with Sloped Ends



Sloping the ends of an Excavation can be an Effective Way of Preventing Encroachments

Trenching Next to Gas Main

(view from above looking down)



Plan View

Parallel Trenching Rules of Thumb:

- **The greater the separation between the gas main and the trench, the better**
- **Keeping the distance between the excavation and the gas main greater than the (depth of the trench - 2') will in most cases avoid an encroachment**

CI Encroachments

- CI Encroachments can occur when excavating under or next to CI gas mains
- CI Encroachments can occur **Even when a gas main is not exposed**
- Two types of Encroachments: Undermine and Parallel
  - **Undermine Encroachments (Cross Trench)**
    - In all cases, the shorter the length of gas main undermined the better
    - Limiting undermining to less than 30" in length will always avoid an encroachment
    - Tunneling under the gas main can be an effective method for avoiding encroachments
  - **Parallel Encroachments**
    - Parallel Encroachments can occur even if the gas main is not exposed
    - In all cases, the greater the separation between the gas main and the parallel excavation, the better
    - Limiting excavations adjacent to gas main to less than 7'-6" in length will always avoid an encroachment
    - Keeping parallel excavations more than the (depth of the trench – 2') from gas main in most cases will prevent an encroachment

GUIDELINES FOR BACKFILL AND COMPACTION AROUND GAS PIPES

PERMANENT BACKFILL AND COMPACTION

DESCRIPTION

This work shall consist of backfilling and compacting all disturbed material at and around existing gas pipes and facilities. Size of pipe, material, length of exposed pipe, location of pipe, etc. will all follow the same set of Standards and Specifications stipulated by Nationalgrid Company. If design plans call for gas pipes to be exposed and supported (sheeting methods not used), then at the time of backfill, all disturbed material below the invert of the gas pipe shall be removed and replaced with suitable roadway or trench excavation material or bedding material. The contractor will not be allowed to replace this disturbed material with the same existing material if it has now been mixed with adjacent silty subsoil (clays) and fines. Well-graded gravel and sands will be used to replace the unsuitable material when no excess suitable material is available on site. Soils with high humus or mineral content should not be used to for backfill because they can promote electrolytic or bacterial attack.

Backfilling the gas pipe should begin immediately after the work in that location is complete. The region within 6" alongside and on top of the gas pipe shall be backfilled with padding sand (free of cinders, ash, and rock). In no case shall the material used for backfilling in this region contain any stones. Backfill shall consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of not more than 8" to 12" after compaction.

Trench spoil material shall be suitable for backfilling above the padding material as long as rocks with a diameter larger than 3" are removed. The layers shall be mechanically compacted to the industry standard of 95% or until a density comparable to the unexcavated material is achieved. In some instances, flooding with water is an acceptable method of compaction but only if the back-fill material is clean, coarse, and adequate drainage is existent. The above specified backfill material is essential in order to attain the degree of compaction necessary to avoid future settlement.

Tracing Wire, if necessary, shall be installed 2” to 6” below Plastic gas pipes.

Warning Tape shall be installed approximately 12” above the gas pipe.

A minimum of 2" temporary pavement shall be applied over the trench as soon as possible.

10/01/12

Guidelines for Working Around Gas Utilities

Notification of Construction

National Grid requests at least six week advanced notification prior to the start of construction to perform scheduled work in the proposed project area. Be aware that some gas work cannot be performed during the normal heating season.

Support and Protect

Contractor must call Dig Safe to have the gas mains and services marked out before construction. Care must be exercised when saw cutting over any gas infrastructure, especially services, which are more shallow than the main. Depth of gas mains vary. Contractor shall dig test pits in order to ascertain exact locations, cover and invert elevations, clearances, alignment and operating status of existing gas facilities. Contractor shall exercise extreme caution when excavating in the vicinity of any gas facility. Hand excavation shall be performed to locate all gas facilities and whenever digging within 24" of gas facilities. If cover over gas piping is removed the required cover must be replaced, or if not feasible, National Grid must be notified for review of the issue. Undermined gas pipe must be adequately supported and protected from damage. Contact National Grid engineer for guidelines regarding proper pipe support. Significant vibration from pile driving and such may negatively impact gas facilities, particularly cast iron mains and regulator station vaults. Contact National Grid engineer prior to performing such activities as well as operations which may undermine gas facilities such as micro-tunneling, jacking, directional drilling, etc.

Gas Leaks

For any gas leak please call the appropriate number immediately.
Greater Boston - 800-233-5325
Other Massachusetts – 800-548-8000
Rhode Island – 800-640-1595

Types of Gas Facilities

Gas mains and services are made of several different materials and contain a wide range of pressures. Typical materials used for buried gas pipe includes bare steel, coated steel, plastic, cast iron, wrought iron, ductile iron, and copper. Never assume that a pipe is not gas. At times gas lines are inserted into older lines to save excavation cost.

Exposure of Gas Facilities

If any gas mains or services become exposed, National Grid must be notified to inspect the line before backfilling. Also any damage that may have been made to the pipe or pipe coating will need to be repaired by National Grid before backfilling. Contact our Dispatch office at (877) 304-1203 for inspection. It is important that even minor damage or scrapes be reported to National Grid. Backfill shall be 6" of sand around the gas line and clean compacted fill above.

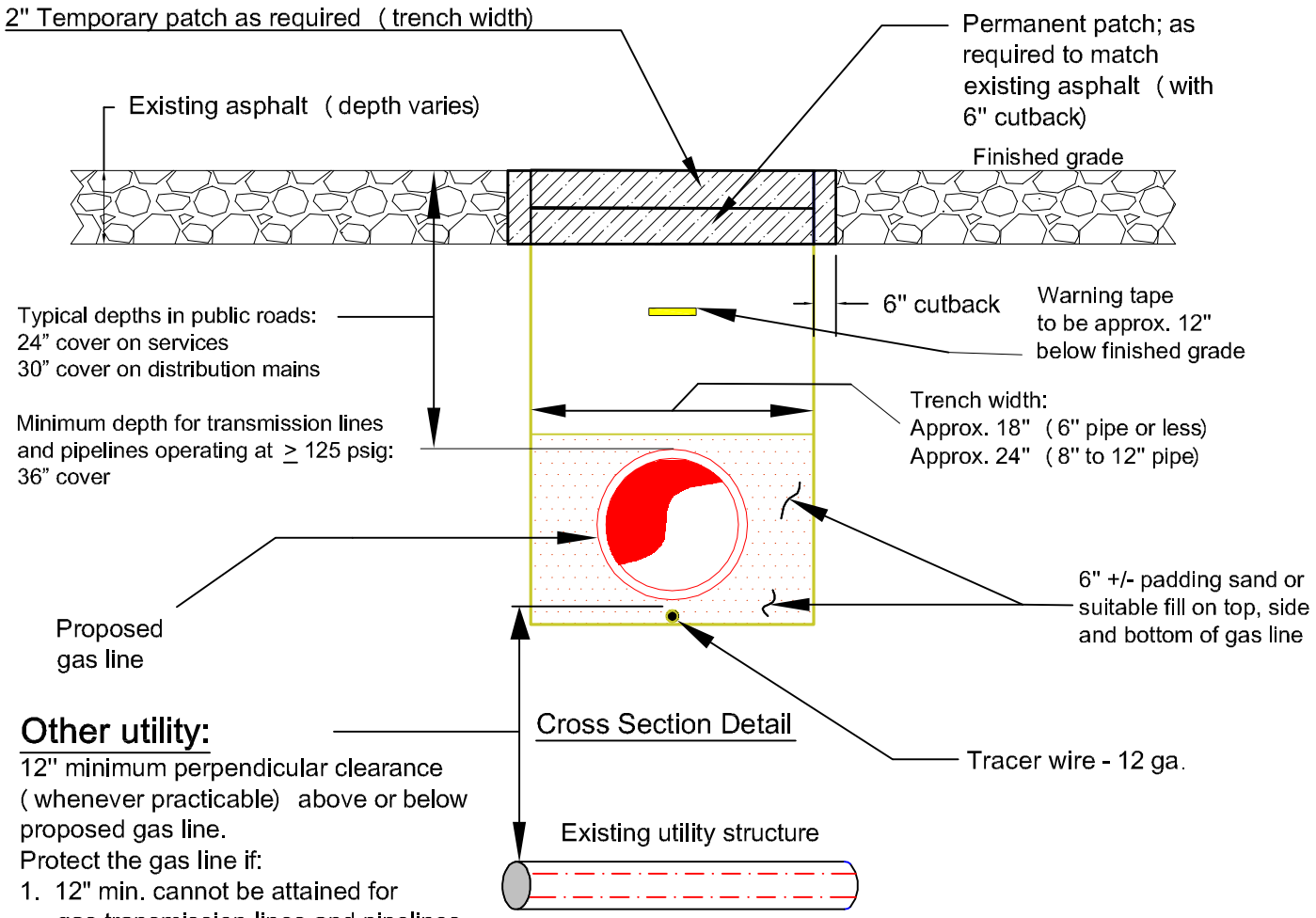
Regulator Stations
Gas regulator stations are particularly critical facilities and National Grid must be notified whenever work is to take place within 200 feet of a station. Regulator stations are typically in buried vaults accessed through either manhole covers or aluminum doors. ONLY AUTHORIZED NATIONAL GRID EMPLOYEES SHALL OPEN A REGULATOR STATION VAULT. Be aware that a complex nest of piping and valves often exists in the vicinity outside the vaults.

Blasting
National Grid must be notified of any blasting that will take place within 200 feet of a gas utility. National Grid must be supplied with a detailed blast plan for blasting in the vicinity of gas facilities. The evaluation of the blast plan by a National Grid engineer may take some time, therefore, blast plan data should be submitted at least two weeks prior to the planned blasting. As a general rule blasting will not be permitted within 10 feet of a gas line and PPV at the nearest gas pipe shall not exceed 5 in/sec. PPV at the nearest gas main shall be monitored.

Valves
Access to gas valves must be maintained throughout construction and left at grade at the end of construction. Should valve boxes be damaged and need to be replaced National Grid will supply replacements upon request. NEVER OPERATE A GAS VALVE. ONLY NATIONAL GRID SHALL OPERATE GAS VALVES.

Clearance
Adequate clearance must be provided when installing other utilities, foundations, structures, etc. Contact National Grid engineer for guidance.

Typical Utility Crossing and Trench Guidelines



Other utility:

12" minimum perpendicular clearance (whenever practicable) above or below proposed gas line.

Protect the gas line if:

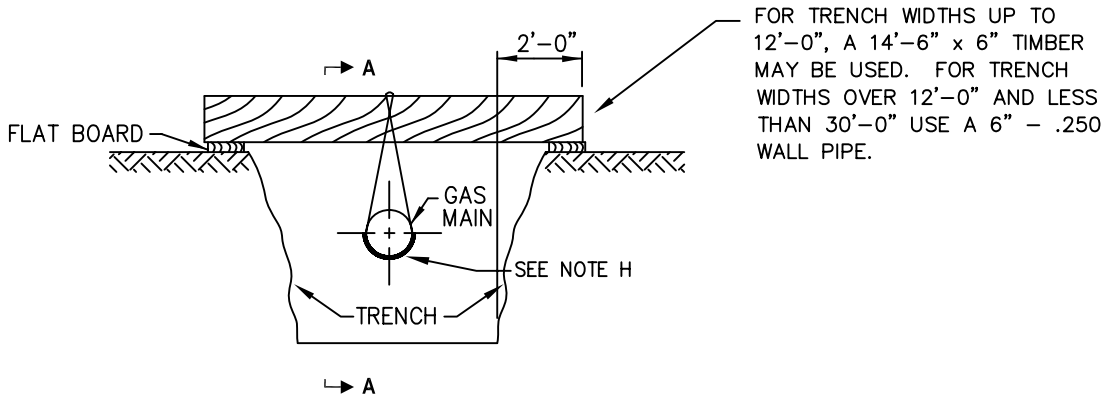
1. 12" min. cannot be attained for gas transmission lines and pipelines operating at ≥ 125 psig.
2. 6" min. cannot be attained for distribution mains.
3. 4" min. cannot be attained for services.

Minimum clearance when protection is provided against damage is 2" for all gas lines.

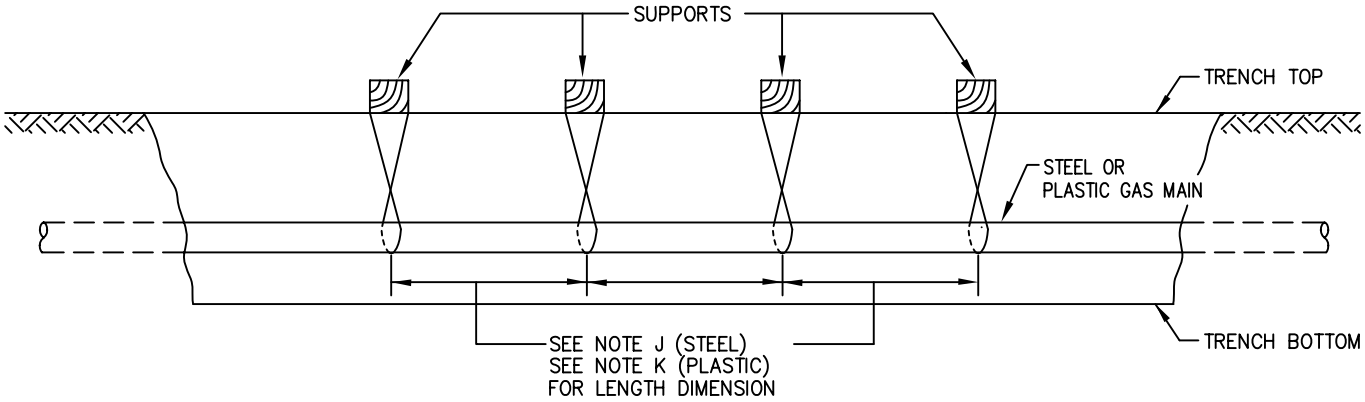
Pipeline backfill will consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of no more than 8" to 12" after compaction. Trench spoil materials suitable for backfilling will be mechanically compacted to the industry standards of 95% (as measured by Drop-Cone Penetrometer method) or until a density comparable to the unexcavated material is achieved.

nationalgrid RI	**TYPICAL UTILITY CROSSING AND TRENCH GUIDELINES**	
Key Changes:	DATE: 09/15/2014 DESIGN: N. COSTANZO DRAWN: N. COSTANZO	EFFECTIVE DATE: 09/15/2014 STD. DWG. NO. **CS-CNST002**

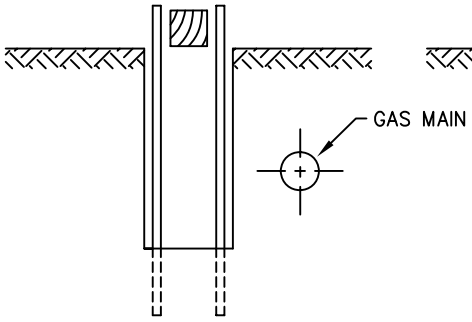
© National Grid Gas plc 2014– All Rights Reserved



EXPOSED SUPPORT



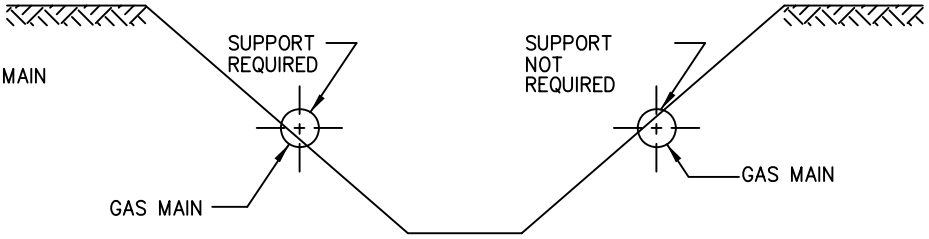
SUPPORTED LENGTH A-A



ADEQUATELY SHORED TRENCH

DETAIL A

SEE NOTE B



INADEQUATELY SHORED OR UNSHORED TRENCH

DETAIL B

SEE NOTE B

nationalgrid

LI-MA-NH-NYC

SUPPORT REQUIREMENTS FOR EXPOSED & UNDERMINED STEEL OR PLASTIC GAS FACILITIES

REVISIONS CLARIFIED NOTES B & C ADDED NOTE N.

DATE: 07/01/2003	EFFECTIVE DATE: 03/24/2006
DESIGN: A. GIULIANI	STD. DWG. NO. **CNST-6045**
DRAWN: P. DIMAIO	

NOTES:

A. THIS CONSTRUCTION STANDARD SHALL BE USED TO SUPPORT PLASTIC OR STEEL GAS FACILITIES WHICH ARE UNDERMINED AND EXPOSED BY CONSTRUCTION ACTIVITY.

B. IF AN EXCAVATION IS MADE AT ANY DISTANCE PARALLEL TO THE GAS FACILITY WITH ADEQUATE OSHA STRUCTURAL SHORING, AS SHOWN IN DETAIL "A", OR IF A STABLE SOIL CONDITION WITH SUFFICIENT COVER ABOVE THE PIPE'S CENTERLINE EXISTS, AS SHOWN IN DETAIL "B", THEN SUPPORTS ARE NOT REQUIRED. UNSTABLE SOIL IS DEFINED AS A SOIL WHICH CAN CAUSE "SOIL RUN OUT" FROM BENEATH THE PIPE (e.g., WASHOUT, SOFT CLAY, etc.,) OR CAN SHIFT DUE TO CONSTRUCTION ACTIVITY, VIBRATIONS, etc.; AND CAUSE A SOIL SCENARIO TO OCCUR AS SHOWN IN DETAIL "B" TO REQUIRE PIPE SUPPORT.

C. IF AN EXCAVATION CROSSES OR RUNS PARALLEL TO A GAS FACILITY, SUPPORTS MAY NOT BE REQUIRED IF THE EXPOSED SECTION OF PLASTIC PIPES IS 3' OR LESS AND STEEL PIPES 7' OR LESS.

D. ALL EXCAVATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONE CALL DIG SAFE PROGRAM USING THE APPROPRIATE MARK OUT, TEST HOLES AND EXCAVATION TO AVOID DAMAGE TO PIPE OR PIPE COATINGS:
- NEW YORK STATE CODE RULE 753
- MA CHAPTER 82 - SECTION 40, GENERAL LAWS, REGULATING NOTICE REQUIREMENTS FOR EXCAVATION IN PUBLIC WAYS
- NH DIG SAFE LAW, RSA 374 – REGULATING UNDERGROUND UTILITY DAMAGE PREVENTION SYSTEM

E. USE OF THIS CONSTRUCTION STANDARD DOES NOT RELIEVE THE CONSTRUCTION AGENCY OR AUTHORITY OR THEIR RESPECTIVE CONTRACTORS OF RESPONSIBILITY FOR DAMAGES. ALL DAMAGES WILL BE REPAIRED IN ACCORDANCE WITH EXISTING STANDARDS AND THE APPROPRIATE PARTY SHALL BE BILLED FOR ALL EXPENSES.

F. GAS FACILITIES SHOULD NOT BE UNDERMINED WITHOUT ADEQUATE SUPPORT (DETAIL A). ALL SUPPORT LINES SHALL BE TENSIONED SO THAT NO DEFLECTION WILL OCCUR WHEN THE FACILITY IS UNDERMINED. THIS TENSION SHALL BE CHECKED AT THE START AND END OF EACH DAY AND ADJUSTED AS NECESSARY.

G. WHERE A COUPLING, GAS SERVICE, CLAMP, VALVE, DRIP LINE OR OTHER APPURTENANCE EXISTS ON THE EXPOSED SECTION OF MAIN, AN ADDITIONAL SUPPORT SHALL BE INSTALLED AT THE LOCATION.

H. WHEN SUPPORTING AN EXPOSED FACILITY, THE PIPE COATING SHALL BE PROTECTED WITH ROCK SHIELD (ITEM ID 00301097), OR OTHER LIKE MATERIAL CUT TO A MINIMUM WIDTH OF ½ THE SUPPORTED PIPE DIAMETER. SUPPORT LINES SHALL BE A MINIMUM OF ¾" POLYPROPYLENE OR BETTER.

I. SUPPORTS FOR GAS TRANSMISSION FACILITIES SHALL BE REVIEWED WITH GAS ENGINEERING PRIOR TO INSTALLATION.

J. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR STEEL FACILITIES SHALL BE AS FOLLOWS:
7' SPACING FOR ¾" AND 1 ¼" STEEL
10' SPACING FOR 2" STEEL
15' SPACING FOR 3" AND 4" STEEL
20' SPACING FOR 6" AND LARGER STEEL

K. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR PLASTIC FACILITIES SHALL BE AS FOLLOWS :
3 ' SPACING FOR 2" AND SMALLER PLASTIC
6' SPACING FOR 4" AND LARGER PLASTIC

L. VIBRATING MACHINES ARE ALLOWED OVER STEEL OR PLASTIC FACILITIES WITH 24" OR GREATER COVER. HAND HELD MECHANICAL. TAMPER IS ACCEPTABLE OVER ANY FACILITY WITH 12" OR GREATER COVER.

M. WHEN CONSTRUCTION ACTIVITY IS COMPLETED, CLEAN FILL SHALL BE COMPACTED AROUND AND UNDER THE GAS FACILITY BEFORE REMOVING SUPPORTS.

N. SEE REGIONAL PBWK5010 PROCEDURES FOR **REPLACEMENT** REQUIREMENTS OF CAST IRON PIPE.

No.	**ITEM**	**CODE No.**

BILL OF MATERIAL

GUIDELINES FOR BACKFILL AND COMPACTION AROUND GAS PIPES

PERMANENT BACKFILL AND COMPACTION

DESCRIPTION

This work shall consist of backfilling and compacting all disturbed material at and around existing gas pipes and facilities. Size of pipe, material, length of exposed pipe, location of pipe, etc. will all follow the same set of Standards and Specifications stipulated by Nationalgrid Company. If design plans call for gas pipes to be exposed and supported (sheeting methods not used), then at the time of backfill, all disturbed material below the invert of the gas pipe shall be removed and replaced with suitable roadway or trench excavation material or bedding material. The contractor will not be allowed to replace this disturbed material with the same existing material if it has now been mixed with adjacent silty subsoil (clays) and fines. Well-graded gravel and sands will be used to replace the unsuitable material when no excess suitable material is available on site. Soils with high humus or mineral content should not be used to for backfill because they can promote electrolytic or bacterial attack.

Backfilling the gas pipe should begin immediately after the work in that location is complete. The region within 6" alongside and on top of the gas pipe shall be backfilled with padding sand (free of cinders, ash, and rock). In no case shall the material used for backfilling in this region contain any stones. Backfill shall consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of not more than 8" to 12" after compaction.

Trench spoil material shall be suitable for backfilling above the padding material as long as rocks with a diameter larger than 3" are removed. The layers shall be mechanically compacted to the industry standard of 95% or until a density comparable to the unexcavated material is achieved. In some instances, flooding with water is an acceptable method of compaction but only if the back-fill material is clean, coarse, and adequate drainage is existent. The above specified backfill material is essential in order to attain the degree of compaction necessary to avoid future settlement.

Tracing Wire, if necessary, shall be installed 2” to 6” below Plastic gas pipes.

Warning Tape shall be installed approximately 12” above the gas pipe.

A minimum of 2" temporary pavement shall be applied over the trench as soon as possible.

10/01/12

Guidelines for Working Around Gas Utilities

Notification of Construction

National Grid requests at least six week advanced notification prior to the start of construction to perform scheduled work in the proposed project area. Be aware that some gas work cannot be performed during the normal heating season.

Support and Protect

Contractor must call Dig Safe to have the gas mains and services marked out before construction. Care must be exercised when saw cutting over any gas infrastructure, especially services, which are more shallow than the main. Depth of gas mains vary. Contractor shall dig test pits in order to ascertain exact locations, cover and invert elevations, clearances, alignment and operating status of existing gas facilities. Contractor shall exercise extreme caution when excavating in the vicinity of any gas facility. Hand excavation shall be performed to locate all gas facilities and whenever digging within 24" of gas facilities. If cover over gas piping is removed the required cover must be replaced, or if not feasible, National Grid must be notified for review of the issue. Undermined gas pipe must be adequately supported and protected from damage. Contact National Grid engineer for guidelines regarding proper pipe support. Significant vibration from pile driving and such may negatively impact gas facilities, particularly cast iron mains and regulator station vaults. Contact National Grid engineer prior to performing such activities as well as operations which may undermine gas facilities such as micro-tunneling, jacking, directional drilling, etc.

Gas Leaks

For any gas leak please call the appropriate number immediately.
Greater Boston - 800-233-5325
Other Massachusetts – 800-548-8000
Rhode Island – 800-640-1595

Types of Gas Facilities

Gas mains and services are made of several different materials and contain a wide range of pressures. Typical materials used for buried gas pipe includes bare steel, coated steel, plastic, cast iron, wrought iron, ductile iron, and copper. Never assume that a pipe is not gas. At times gas lines are inserted into older lines to save excavation cost.

Exposure of Gas Facilities

If any gas mains or services become exposed, National Grid must be notified to inspect the line before backfilling. Also any damage that may have been made to the pipe or pipe coating will need to be repaired by National Grid before backfilling. Contact our Dispatch office at (877) 304-1203 for inspection. It is important that even minor damage or scrapes be reported to National Grid. Backfill shall be 6" of sand around the gas line and clean compacted fill above.

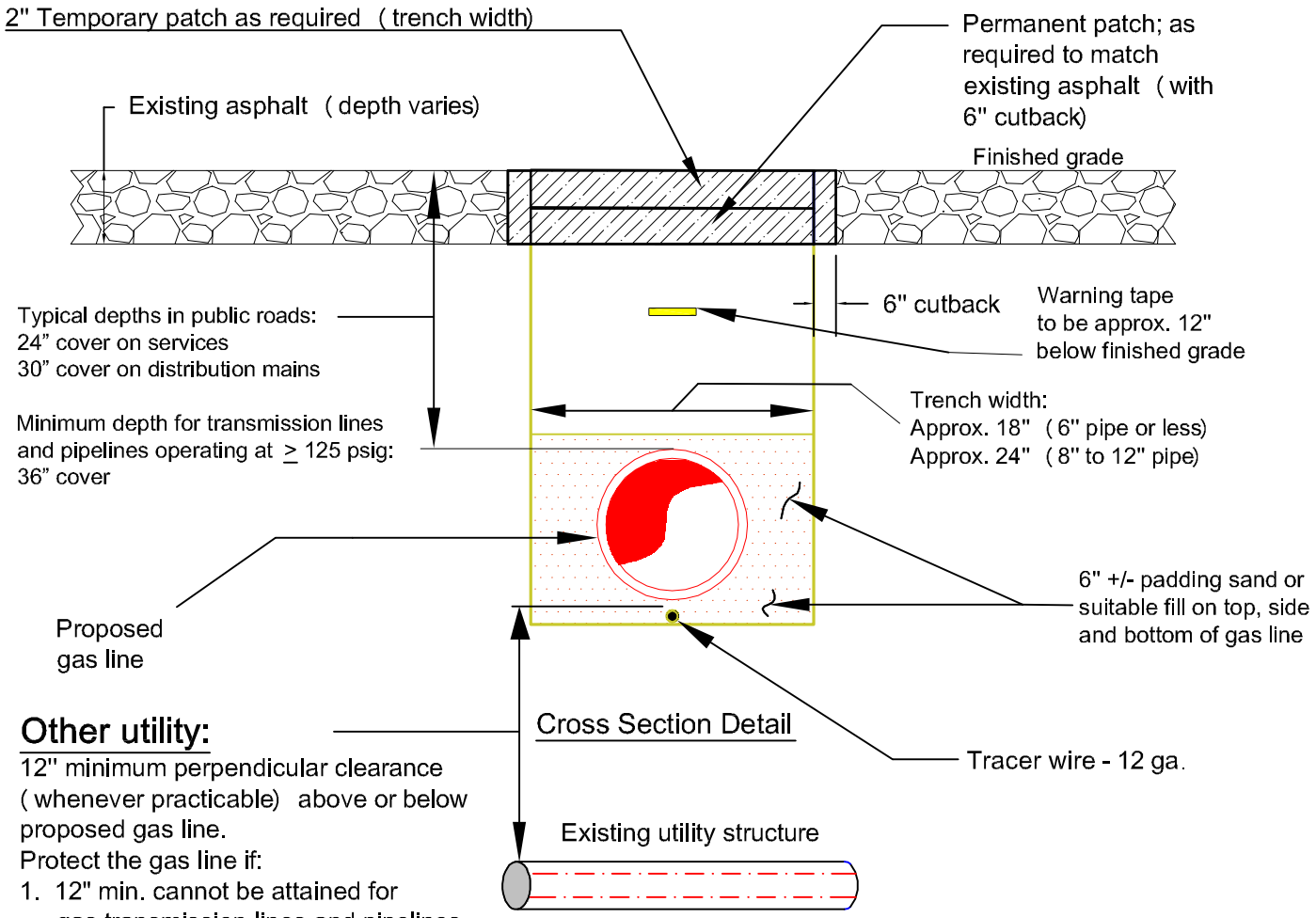
Regulator Stations
Gas regulator stations are particularly critical facilities and National Grid must be notified whenever work is to take place within 200 feet of a station. Regulator stations are typically in buried vaults accessed through either manhole covers or aluminum doors. ONLY AUTHORIZED NATIONAL GRID EMPLOYEES SHALL OPEN A REGULATOR STATION VAULT. Be aware that a complex nest of piping and valves often exists in the vicinity outside the vaults.

Blasting
National Grid must be notified of any blasting that will take place within 200 feet of a gas utility. National Grid must be supplied with a detailed blast plan for blasting in the vicinity of gas facilities. The evaluation of the blast plan by a National Grid engineer may take some time, therefore, blast plan data should be submitted at least two weeks prior to the planned blasting. As a general rule blasting will not be permitted within 10 feet of a gas line and PPV at the nearest gas pipe shall not exceed 5 in/sec. PPV at the nearest gas main shall be monitored.

Valves
Access to gas valves must be maintained throughout construction and left at grade at the end of construction. Should valve boxes be damaged and need to be replaced National Grid will supply replacements upon request. NEVER OPERATE A GAS VALVE. ONLY NATIONAL GRID SHALL OPERATE GAS VALVES.

Clearance
Adequate clearance must be provided when installing other utilities, foundations, structures, etc. Contact National Grid engineer for guidance.

Typical Utility Crossing and Trench Guidelines



Other utility:

12" minimum perpendicular clearance (whenever practicable) above or below proposed gas line.

Protect the gas line if:

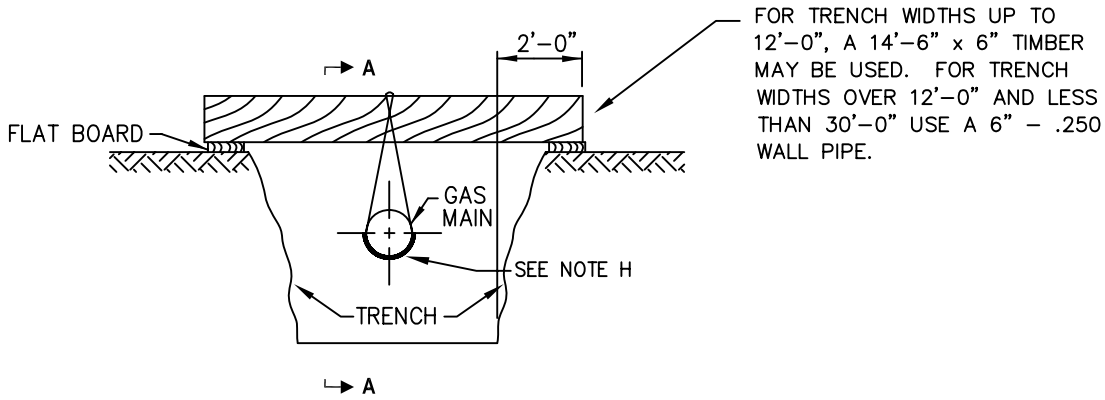
1. 12" min. cannot be attained for gas transmission lines and pipelines operating at ≥ 125 psig.
2. 6" min. cannot be attained for distribution mains.
3. 4" min. cannot be attained for services.

Minimum clearance when protection is provided against damage is 2" for all gas lines.

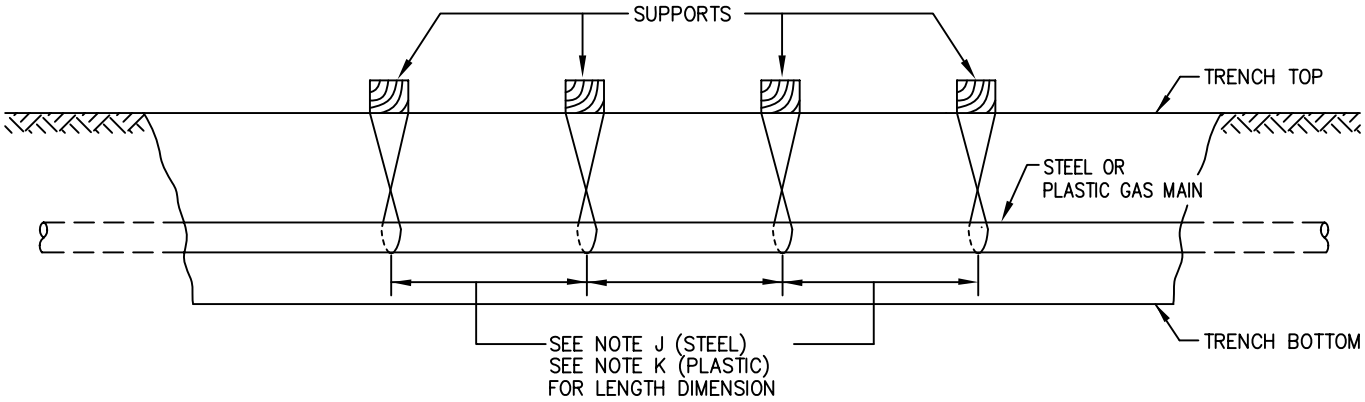
Pipeline backfill will consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of no more than 8" to 12" after compaction. Trench spoil materials suitable for backfilling will be mechanically compacted to the industry standards of 95% (as measured by Drop-Cone Penetrometer method) or until a density comparable to the unexcavated material is achieved.

nationalgrid RI	**TYPICAL UTILITY CROSSING AND TRENCH GUIDELINES**	
Key Changes:	DATE: 09/15/2014 DESIGN: N. COSTANZO DRAWN: N. COSTANZO	EFFECTIVE DATE: 09/15/2014 STD. DWG. NO. **CS-CNST002**

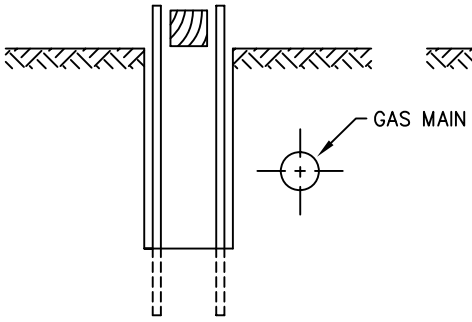
© National Grid Gas plc 2014– All Rights Reserved



EXPOSED SUPPORT



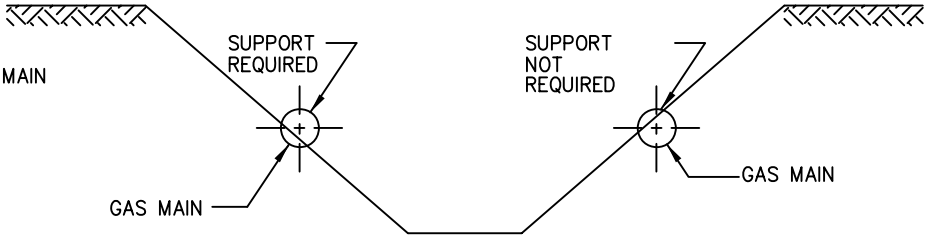
SUPPORTED LENGTH A-A



ADEQUATELY SHORED TRENCH

DETAIL A

SEE NOTE B



INADEQUATELY SHORED OR UNSHORED TRENCH

DETAIL B

SEE NOTE B

nationalgrid

LI-MA-NH-NYC

SUPPORT REQUIREMENTS FOR EXPOSED & UNDERMINED STEEL OR PLASTIC GAS FACILITIES

REVISIONS CLARIFIED NOTES B & C ADDED NOTE N.

DATE: 07/01/2003	EFFECTIVE DATE: 03/24/2006
DESIGN: A. GIULIANI	STD. DWG. NO. **CNST-6045**
DRAWN: P. DIMAIO	

NOTES:

A. THIS CONSTRUCTION STANDARD SHALL BE USED TO SUPPORT PLASTIC OR STEEL GAS FACILITIES WHICH ARE UNDERMINED AND EXPOSED BY CONSTRUCTION ACTIVITY.

B. IF AN EXCAVATION IS MADE AT ANY DISTANCE PARALLEL TO THE GAS FACILITY WITH ADEQUATE OSHA STRUCTURAL SHORING, AS SHOWN IN DETAIL "A", OR IF A STABLE SOIL CONDITION WITH SUFFICIENT COVER ABOVE THE PIPE'S CENTERLINE EXISTS, AS SHOWN IN DETAIL "B", THEN SUPPORTS ARE NOT REQUIRED. UNSTABLE SOIL IS DEFINED AS A SOIL WHICH CAN CAUSE "SOIL RUN OUT" FROM BENEATH THE PIPE (e.g., WASHOUT, SOFT CLAY, etc.,) OR CAN SHIFT DUE TO CONSTRUCTION ACTIVITY, VIBRATIONS, etc.; AND CAUSE A SOIL SCENARIO TO OCCUR AS SHOWN IN DETAIL "B" TO REQUIRE PIPE SUPPORT.

C. IF AN EXCAVATION CROSSES OR RUNS PARALLEL TO A GAS FACILITY, SUPPORTS MAY NOT BE REQUIRED IF THE EXPOSED SECTION OF PLASTIC PIPES IS 3' OR LESS AND STEEL PIPES 7' OR LESS.

D. ALL EXCAVATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONE CALL DIG SAFE PROGRAM USING THE APPROPRIATE MARK OUT, TEST HOLES AND EXCAVATION TO AVOID DAMAGE TO PIPE OR PIPE COATINGS:
- NEW YORK STATE CODE RULE 753
- MA CHAPTER 82 - SECTION 40, GENERAL LAWS, REGULATING NOTICE REQUIREMENTS FOR EXCAVATION IN PUBLIC WAYS
- NH DIG SAFE LAW, RSA 374 – REGULATING UNDERGROUND UTILITY DAMAGE PREVENTION SYSTEM

E. USE OF THIS CONSTRUCTION STANDARD DOES NOT RELIEVE THE CONSTRUCTION AGENCY OR AUTHORITY OR THEIR RESPECTIVE CONTRACTORS OF RESPONSIBILITY FOR DAMAGES. ALL DAMAGES WILL BE REPAIRED IN ACCORDANCE WITH EXISTING STANDARDS AND THE APPROPRIATE PARTY SHALL BE BILLED FOR ALL EXPENSES.

F. GAS FACILITIES SHOULD NOT BE UNDERMINED WITHOUT ADEQUATE SUPPORT (DETAIL A). ALL SUPPORT LINES SHALL BE TENSIONED SO THAT NO DEFLECTION WILL OCCUR WHEN THE FACILITY IS UNDERMINED. THIS TENSION SHALL BE CHECKED AT THE START AND END OF EACH DAY AND ADJUSTED AS NECESSARY.

G. WHERE A COUPLING, GAS SERVICE, CLAMP, VALVE, DRIP LINE OR OTHER APPURTENANCE EXISTS ON THE EXPOSED SECTION OF MAIN, AN ADDITIONAL SUPPORT SHALL BE INSTALLED AT THE LOCATION.

H. WHEN SUPPORTING AN EXPOSED FACILITY, THE PIPE COATING SHALL BE PROTECTED WITH ROCK SHIELD (ITEM ID 00301097), OR OTHER LIKE MATERIAL CUT TO A MINIMUM WIDTH OF ½ THE SUPPORTED PIPE DIAMETER. SUPPORT LINES SHALL BE A MINIMUM OF ¾" POLYPROPYLENE OR BETTER.

I. SUPPORTS FOR GAS TRANSMISSION FACILITIES SHALL BE REVIEWED WITH GAS ENGINEERING PRIOR TO INSTALLATION.

J. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR STEEL FACILITIES SHALL BE AS FOLLOWS:
7' SPACING FOR ¾" AND 1 ¼" STEEL
10' SPACING FOR 2" STEEL
15' SPACING FOR 3" AND 4" STEEL
20' SPACING FOR 6" AND LARGER STEEL

K. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR PLASTIC FACILITIES SHALL BE AS FOLLOWS :
3 ' SPACING FOR 2" AND SMALLER PLASTIC
6' SPACING FOR 4" AND LARGER PLASTIC

L. VIBRATING MACHINES ARE ALLOWED OVER STEEL OR PLASTIC FACILITIES WITH 24" OR GREATER COVER. HAND HELD MECHANICAL. TAMPER IS ACCEPTABLE OVER ANY FACILITY WITH 12" OR GREATER COVER.

M. WHEN CONSTRUCTION ACTIVITY IS COMPLETED, CLEAN FILL SHALL BE COMPACTED AROUND AND UNDER THE GAS FACILITY BEFORE REMOVING SUPPORTS.

N. SEE REGIONAL PBWK5010 PROCEDURES FOR **REPLACEMENT** REQUIREMENTS OF CAST IRON PIPE.

No.	**ITEM**	**CODE No.**

BILL OF MATERIAL

APPENDIX G
RIPDES Stormwater Permit

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX H
CRMC Assent

THIS PAGE INTENTIONALLY LEFT BLANK