



Corrected Final Geotechnical and Topographic Site Investigation of Proposed Wind Turbine Sites

Naval Station Newport
Newport, Rhode Island



Prepared for

Department of the Navy NAVFAC Engineering & Expeditionary Warfare Center

Contract No.
N62583-11-D-0533
CTO-WE16

February 2013

Prepared by

CH2MHILL / CLARK•NEXSEN
Architecture & Engineering
(a joint venture)

Corrected Final

Geotechnical and Topographic Site Investigation of Proposed Wind Turbine Sites, Naval Station Newport, Newport, Rhode Island

Prepared for
NAVFAC MIDLANT PWD Newport

February 2013

CH2MHILL®

11818 Rock Landing Drive
Newport News, VA 23606-4230

Preface

This report for the Geotechnical and Topographic Site Investigation of Proposed Wind Turbine Sites summarizes site work and research conducted in late July, August, and early September 2012 at Naval Station Newport, Newport, Rhode Island. The following deliverables are required under Contract N62583-D-0533, Task Order Number WE16:

- Topographic Survey of each proposed site (1 acre)
- Subsurface Investigations – Borings, Test Pits and Utility Locating
- Environmental Condition of Property (ECP) Checklist of each proposed site (provided under separate cover)
- Geotechnical Report including Subsurface Investigations
- Geotechnical Design Guidance on Site Limitations
- Reference Drawings and Site Plans

CH2M HILL and two subcontractors, McPhail Associates, LLC and Green Seal Environmental, Inc., evaluated existing site conditions, identified deficiencies, performed necessary field work, researched existing Public Works Department (PWD) document archives, and met with Naval Station personnel in order to provide a geotechnical investigation report and topographic surveys for the proposed wind turbine sites at the following locations:

1. Bishops Rock
2. Prichard Field North
3. Prichard Field South
4. Building 1112 (Coddington Point)
5. Navy Lodge
6. Former Derecktor Shipyard (Coddington Cove) [IR]
7. Naval Undersea Warfare Center (NUWC) [IR]

CH2M HILL, McPhail Associates, and Green Seal Environmental appreciate the efforts of everyone who provided information and guidance in this process. The entire PWD team, especially Brian Sneed, Jim Carlson, Tara Moll (NUWC), and Fran Furtado were instrumental in getting equipment and personnel access to the sites. Without their efforts, the field activities would have been delayed. We sincerely hope this report will provide useful information to the U.S. Navy in its endeavor to install wind turbines at Naval Station Newport, produce renewable energy, and meet federal energy goals. If there are questions relating to this report, please contact:

Katherine “Kat” Lindler, P.E., LEED GA
CH2M HILL
11818 Rock Island Landing Drive
Newport News, VA 23606-4230
Phone: 757.873.1442 x41641
Email: katherine.lindler@ch2m.com

This page is intentionally left blank.

Contents

Preface	i
Acronyms and Abbreviations	v
Disclaimer	vii
Geotechnical and Topographical Site Investigation of Proposed Wind Turbine Site, NAVSTA Newport	1
1 Introduction	1
1.1 Overview of Sites	3
1.1.1 Bishops Rock	3
1.1.2 Prichard Field North.....	3
1.1.3 Prichard Field South.....	4
1.1.4 Building 1112 (Coddington Point).....	4
1.1.5 Navy Lodge	5
1.1.6 Former Derektor Shipyard (Coddington Cove) [IR].....	5
1.1.7 NUWC [IR].....	6
2 Geotechnical Investigation Summary	7
2.1 Work Approach.....	7
2.2 Findings.....	7
3 Conclusion	8
Figure	
1 Proposed Wind Turbine Sites at NAVSTA Newport.....	2
Appendixes	
A Geotechnical Report	
B Surveyors Report and Topographic Survey Site Plans	
C Government Furnished Geotechnical Investigation of Anomaly Locations Identified in Site Surveys	

This page is intentionally left blank.

Acronyms and Abbreviations

EPA	U.S. Environmental Protection Agency
IBC	International Building Code
IR	Installation Restoration site
NAVSTA	Naval Station
NUWC	Naval Undersea Warfare Center
WWII	World War II

This page is intentionally left blank.

Disclaimer

This assessment has been prepared for the exclusive use and reliance of the client. It may not be reproduced without the approval of the client. Any conclusions or observations included in this report are intended for the sole use of the client. Use or reliance by any other party is prohibited without the written authorization of the client and CH2M HILL. Any use of or reliance upon the information by a third party other than the client shall be at the sole risk and liability of such third party and without legal recourse against CH2M HILL, its subsidiaries and affiliates, or their respective employees, officers, or directors.

It is beyond CH2M HILL, INC.'s scope of work to review or examine: (1) materials containing asbestos; (2) the presence of radon; (3) the presence of lead-based paint; (4) lead in drinking water; (5) identification or delineation of jurisdictional wetlands; (6) issues associated with worker health and safety; (7) issues pertaining to compliance with environmental regulations; or (8) liabilities associated with the offsite management of solid or hazardous wastes.

Any opinions or recommendations presented apply to site conditions existing when services were performed. CH2M HILL, INC. cannot report on, or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces.

CH2M HILL, INC. assumes no responsibility for conditions we are not authorized to investigate, or which are not in our specific Scope of Work.

This page is intentionally left blank.

Geotechnical and Topographical Site Investigation of Proposed Wind Turbine Site, NAVSTA Newport

1 Introduction



Naval Station (NAVSTA) Newport is located in the southern part of Rhode Island adjacent to the towns of Middletown and Jamestown, RI, and the city of Newport, RI. Due to its proximity to the Atlantic Ocean on the Narragansett Bay and the U.S. Environmental Protection Agency's (EPA) *RE-Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites* initiative, the potential for wind energy production was investigated and numerous sites identified (see Figure 1). Further screening of the sites produced the list of seven candidate locations for geotechnical and environmental site investigation.

Sites for Geotechnical and Environmental investigation include:

1. Bishops Rock
2. Prichard Field North
3. Prichard Field South
4. Building 1112 (Coddington Point)
5. Navy Lodge
6. Former Derecktor Shipyard (Coddington Cove) Installation Restoration site (IR)
7. Naval Undersea Warfare Center (NUWC) IR

FIGURE 1
Proposed Wind Turbine Sites at NAVSTA Newport



1.1 Overview of Sites

1.1.1 Bishops Rock



Bishops Rock looking to the north



Bishops Rock roundabout driveway

Bishops Rock is located at the tip of a jetty at the end of Barschow Street. The site includes a small gazebo and roundabout gravel driveway. This parcel used to have a pier that was used to unload coal ships. It was unused after World War II (WWII) and then converted into a recreational area. A sanitary sewer discharge line from the local Publicly Owned Treatment Works to the permitted outfall crosses the general area of the parcel.

1.1.2 Prichard Field North



Prichard Field North looking to the north



Prichard Field North utility building

Prichard Field North is the area bounded by Barschow Street to the south, Copodanno Drive to the east and the bay to the northwest. The site was historically on the edge of a WWII dormitory complex. The site has had numerous structures on it in the past and currently includes grassy areas with walkways and a sanitary sewer lift station with an exterior concrete platform supporting a backup generator in the southwest corner.

1.1.3 Prichard Field South



Prichard Field South looking to the south

Prichard Field South includes a baseball field to the north and the bay to the south. A concrete retaining wall bounds the southern portion of the site and the remainder is covered by running path, grassed areas, and a concrete pad. The parcel was constructed on manmade fill. Prior to WWII, the parcel had a boat boom, two boat houses, and two piers extending from the dock area. The facilities were used for oarsman training. The property also borders the edge of a WWII-era dormitory complex.

1.1.4 Building 1112 (Coddington Point)



Coddington Point looking to the northeast



Coddington Point running path

Coddington Point is on the western tip of Coddington Cove. A drainage swale runs along the southern perimeter of the site and the remainder is covered by grassed areas and a running path. No development was indicated prior to WWII and only a gun platform was located southwest of the parcel for training purposes. A pistol firing range was located east and adjacent to the parcel prior to 1945 and portions of the area have been filled in.

1.1.5 Navy Lodge



Navy Lodge looking east



Navy Lodge path and steam line

Navy Lodge lies in between Whipple Street and Coddington Cove. An aboveground steam pipe runs along the perimeter of the site. The remainder of the site is covered by grassed areas and a running path. The shoreline area adjacent to the parcel and the parcel have not been developed since before the 1920s except for the steam line constructed between 1940 and 1943.

1.1.6 Former Derecktor Shipyard (Coddington Cove) IR Site



Derecktor looking northeast



Derecktor looking toward paved area

The Derecktor site is located between Burma Road to the east and Coddington Cove to the west. The site includes paved and grassed areas. In 1942, the Navy acquired Coddington Cove, where Derecktor Shipyard is located, by condemnation to expand the Navy facilities. Prior to the purchase, the area was part of a small airport. Two piers were constructed and the area where the parcel is located was built from dredge material. Drawings from 1945 indicate a portion of the parcel and the area to north were used for coal storage. The 1963 drawings show the parcel and surrounding area had warehouse buildings and a cold storage building. The area was part of Navy supply and was used as a storage area to restock ships. The parcel was leased to the Rhode Island Port Authority and Economic Development Corporation, which subleased it to Derecktor, a private shipyard. The private shipyard operated from approximately 1978 to 1988. The shipyard was used to construct and maintain Coast Guard cutters and ferries.

1.1.7 NUWC IR Site



NUWC looking northeast



NUWC concrete structure

NUWC is located on the northern limits of the Naval Undersea Warfare Center property with access roads to the west and south and a small pond to the north and east. The site is mainly a soil stockpile. Other than utility lines, the first evidence of structures on the parcel was on the 1982 drawings, which show a temporary office building. The building had been removed prior to 1989 and was left idle or part of parking areas during this period prior to being used as a stockpile area for soil.

The results of the geotechnical investigation and topographic survey are included in the following section and appendixes of this report.

2 Geotechnical Investigation Summary

2.1 Work Approach

Two borings and one test pit at each site were completed and evaluated during the performance of this study. The purposes of the subsurface exploration program and foundation design study are to define the subsurface soil, rock, and groundwater conditions as they relate to foundation design and, based on these conditions, to provide site-specific engineering recommendations for the proposed wind turbine sites. Foundation design includes foundation support of the proposed wind turbine structures, and seismic design considerations in accordance with the provisions of the 2009 Edition of the International Building Code (IBC). Foundation construction considerations are also addressed herein.

The purpose of the geoenvironmental assessment is to address environmental considerations associated with soil and groundwater that may be encountered during construction of the proposed wind turbine foundations. The geoenvironmental assessment addresses the corrosivity potential of the existing soils on pipes and deep foundation elements, as well as the potential for concrete degradation due to sulfate action.

2.2 Findings

In consideration of the variable subsurface conditions documented across the individual wind turbine sites, namely the presence of the thicker fill and organic deposits at certain sites, two types of foundation systems are recommended for the proposed wind turbine structures: shallow foundations consisting of structural mats, and deep foundations consisting of drilled micropiles or caissons.

The sites where the subsurface conditions are considered appropriate for the use of structural mats for foundation support include Coddington Point and NUWC. The sites where foundation support utilizing drilled micropiles or straight shaft caissons are considered appropriate include Bishop's Rock, Prichard Field North, Prichard Field South, Navy Lodge, and Derecktor.

Based on the results of the corrosion analyses, the soil represented by the granular fill samples taken at Bishops Rock, Prichard Field North, Prichard Field South, Coddington Point, and NUWC sites is considered to be corrosive. Also, the soil represented by the organic soil sample taken from the Navy Lodge site is also considered to be corrosive. It is recommended that steel pipes and utilities installed at these sites be provided with cathodic protection or a sacrificial thickness of excess steel beyond design requirements, also known as corrosion allowance, of a 1/16-inch thickness on all exposed surfaces. Permanent steel casing for micropiles designed to resist axial and/or lateral load should also be provided with a 1/16-inch thickness of corrosion allowance on all exposed surfaces. Additionally, it is recommended that reinforcing steel in footings and pile caps be provided with a minimum of 3 inches of concrete cover.

For the purposes of determining parameters for structural seismic design, Bishops Rock, Prichard Field North, Coddington Point, Derecktor, and NUWC sites are considered to be a Site Class C as defined in Section 1613.5.2 of the Code. The Prichard Field South and Navy Lodge sites are considered to be a Site Class D as defined in Section 1613.5.2 of the IBC.

For the full geotechnical report with lab results, please refer to Appendix A.

3 Conclusion

The geotechnical and environmental site investigation of the seven proposed wind turbine sites revealed surface and subsurface information that will aid in determining the best locations for the wind turbines and also to define the existing conditions for future property transfer and project design. The sites were ranked, prior to this investigation, in the following order based on known issues and wind potential:

1. Former Derecktor Shipyard (Coddington Cove) (IR)
2. Navy Lodge
3. Building 1112 (Coddington Point)
4. Prichard Field South
5. Bishop's Rock
6. NUWC (IR)
7. Prichard Field North

Based on the geotechnical investigations and survey, it does not appear that any changes are needed in the prioritization of the potential wind turbine sites.

Appendix A
Geotechnical Report



GEOTECHNICAL ENGINEERING REPORT

**NAVAL STATION NEWPORT
PROPOSED WIND TURBINES**

NEWPORT RHODE ISLAND

for

CH2M Hill

December 5, 2012

Project No. 5441.2.00



CONTENTS

<u>ITEM</u>	<u>PAGE</u>
INTRODUCTION	1
PURPOSE AND SCOPE	1
AVAILABLE INFORMATION	1
PROPOSED DEVELOPMENT	2
EXISTING CONDITIONS	2
SUBSURFACE EXPLORATION PROGRAM	4
GEOTECHNICAL LABORATORY TESTING	6
CHEMICAL TESTING OF SOIL SAMPLES	7
CHEMICAL TESTING OF GROUNDWATER	9
SUBSURFACE CONDITIONS	9
FOUNDATION DESIGN RECOMMENDATIONS	18
SEISMIC DESIGN CONSIDERATIONS	26
GEOTECHNICAL CONSTRUCTION CONSIDERATIONS	27



CONTENTS (CONTINUED)

FIGURES

Figure 1:	Project Location Plan
Figure 2A:	Subsurface Exploration Plan: Bishop's Rock
Figure 2B:	Subsurface Exploration Plan: Prichard Field North
Figure 2C:	Subsurface Exploration Plan: Prichard Field South
Figure 2D:	Subsurface Exploration Plan: Coddington Point
Figure 2E:	Subsurface Exploration Plan: Navy Lodge
Figure 2F:	Subsurface Exploration Plan: Derecktor
Figure 2G:	Subsurface Exploration Plan: NUWC

TABLES

Table 1:	Analytical Test Results - Soil
Table 2:	Analytical Test Results - Groundwater
Table 3:	Summary of Subsurface Conditions

APPENDICES

Appendix A:	Limitations
Appendix B:	Boring Logs B-1 through B-14
Appendix C:	Test Pit Logs TP-1 through TP-7
Appendix D:	Groundwater Monitoring Reports
Appendix E:	Results of Geotechnical Laboratory Testing of Soil Samples
Appendix F:	Results of Geotechnical Laboratory Testing of Rock Core Samples Rock Core Photographs
Appendix G:	Laboratory Chemical Testing Data - Soil
Appendix H:	Laboratory Chemical Testing Data - Groundwater

**INTRODUCTION**

This report presents the results of our subsurface exploration program, geotechnical and geoenvironmental laboratory testing, and foundation design study for the seven (7) proposed wind turbine sites located at Naval Station Newport in Newport, Rhode Island. Refer to the Project Location Plan, Figure 1, for the general site locus and the approximate location of the seven individual proposed wind turbine sites.

The subsurface exploration program was conducted and the engineering services performed in accordance with the Statement of Work (SOW) provided to McPhail Associates, LLC (McPhail) by CH2M Hill and dated May 9, 2012 (Revised May 24, 2012). These services are subject to the limitations contained in Appendix A.

**PURPOSE
AND SCOPE**

The purposes of the subsurface exploration program and foundation design study are to define the subsurface soil, rock and groundwater conditions as they relate to foundation design and, based on these conditions, to provide site specific engineering recommendations for the proposed wind turbine sites. Foundation design includes foundation support of the proposed wind turbine structures, and seismic design considerations in accordance with the provisions of the 2009 Edition of the International Building Code (Code) and the Unified Facilities Criteria (UFC) 3-301-01, Structural Engineering, dated January 31, 2012. Foundation construction considerations are also addressed herein.

The purpose of our geoenvironmental assessment is to address environmental considerations associated with soil and groundwater that may be encountered during construction of the proposed wind turbine foundations. Our geoenvironmental assessment also addresses the corrosivity potential of the existing soils on pipes and deep foundation elements, as well as the potential for concrete degradation due to sulfate action.

**AVAILABLE
INFORMATION**

Information provided to McPhail included a set of seven (7) untitled, undated drawings prepared by Green Seal Environmental, Inc. which detail the existing conditions at each of the seven proposed wind turbine sites. McPhail was also provided with a report prepared by the National



Renewable Energy Laboratory (NREL) entitled "Naval Station Newport Wind Resource Assessment," dated February 2012.

Elevations cited herein are in feet and are referenced to the North American Vertical Datum of 1988 (NAVD88).

**PROPOSED
DEVELOPMENT**

The project may include the construction of a single wind turbine at seven proposed wind turbine sites located at Naval Station Newport and the Naval Undersea Warfare Center in Newport, Rhode Island. As indicated in the referenced NREL report, it is our understanding that the proposed foundations will need to support wind turbines of 3 megawatt (MW) capacity or smaller.

**EXISTING
CONDITIONS**

The general location and existing site conditions at each proposed wind turbine site are discussed below. The existing conditions at each site are indicated on the enclosed Subsurface Exploration Plans, Figures 2A through 2G.

Bishop's Rock

The approximate 0.6-acre Bishop's Rock site is located at the tip of a jetty at the end of Barschow Street. The site is currently occupied by a roundabout gravel driveway, a small wood framed gazebo, multiple concrete pads, and grassed and landscaped areas. The site is also underlain by multiple below grade utilities. The existing grade across the Bishop's Rock site is relatively level, varying from about Elevation +6 to Elevation +8.

Prichard Field North

Bounded by Barschow Street to the south, Copodanno Drive to the east, and the bay to the northwest, the approximate 0.6-acre Prichard Field North site abuts the jetty extending to the Bishop's Rock site. At the southwest corner of the site is an existing small, rectangular concrete block building surrounded by a few concrete platforms. The remainder of the site is covered by walkways and grassed areas. The site is also



underlain by multiple below grade utilities. The existing ground surface at the Prichard Field North site slopes gently upward from the southwest corner of the site at about Elevation +5.5 to the northeast corner of the site at about Elevation +9, across a horizontal distance of about 220 feet.

Prichard Field South

Bounded by an existing baseball field to the north and the bay to the south, the approximate 0.3-acre Prichard Field South site abuts the jetty extending to the Bishop's Rock site. A concrete retaining wall with top of wall at approximate Elevation +7 bounds the southern portion of the site adjacent to the bay. The remainder of the site is covered by walkways and grassed areas. The existing ground surface at the Prichard Field South site is relatively level, varying from about Elevation +5 to Elevation +6.

Coddington Point

Located at the western tip of Coddington Cove, the approximate 0.4-acre Coddington Point site is bounded to the west by Copodanno Drive, and to the north and east by the bay. An approximate 30-foot wide drainage swale runs along the southern perimeter of the site. The remainder of the site is covered by walkways and grassed areas. The existing ground surface at the Coddington Point site slopes down gradually from the north side of the drainage swale at about Elevation +24 to the north end of the site at approximate Elevation +17, across a horizontal distance of about 100 feet.

Navy Lodge

Fronting onto Whipple Street to the southeast, the approximate 1/4-acre Navy Lodge site is bounded to the northwest by Coddington Cove. An above ground steam pipe runs along the perimeter of the site bordering Whipple Street. The remainder of the site is covered by walkways and grassed areas. The existing ground surface at the Navy Lodge site slopes downward from the southeast to the northwest, from about Elevation +7 to Elevation +4, across a horizontal distance of about 80 feet.



Derecktor

Fronting onto Burma Road to the east and bounded by Coddington Cove to the west, the Derecktor site occupies an approximate 0.4-acre footprint. The site is currently covered by paved and grassed areas. The site is also underlain by multiple below grade utilities. The existing grade across the site slopes gradually downward from east to west, from about Elevation +18 to Elevation +12, across a horizontal distance of about 200 feet.

NUWC

The approximate 1.4-acre NUWC site is located at the northern limits of the Naval Undersea Warfare Center property. The site is bounded by access roads to the west and south and a small pond to the north and east. A large soil stockpile with a footprint of about 19,000 square feet is present at the center of the site. There is also a small existing building at the southeast corner of the site. The surface treatments at the site consist of gravel and grass covered areas. The site is also underlain by multiple below grade utilities. With the exception of the soil stockpile, which has a top elevation of about Elevation +65, the existing grade across the NUWC site slopes downward from south to north, from about Elevation +46 to Elevation +39, across a horizontal distance of about 300 feet.

SUBSURFACE EXPLORATION PROGRAM

The following is a summary of the subsurface exploration program conducted by McPhail at the seven proposed wind turbine sites. The borings and test pits were performed by Geologic Earth Exploration, Inc. of Norwood, Massachusetts under contract to McPhail. Logs of the borings and test pits are contained in Appendices B and C, respectively, and approximate exploration locations are as indicated on the enclosed Subsurface Exploration Plans, Figures 2A through 2G.

A subsurface exploration program consisting of fourteen (14) borings (B-1 through B-14) was conducted at the project site during the period of August 28 through September 7, 2012. Two (2) borings were performed at each of the seven sites. The borings were advanced to depths ranging



from 24 to 42 feet below the existing ground surface into the bedrock or glacial till deposits underlying the wind turbine sites. At locations where the top of sound bedrock was encountered in the borings at a depth less than 35 feet below the ground surface, 10 feet of rock coring was typically performed. Otherwise, the borings were advanced to a depth of at least 35 feet below the existing ground surface.

The borings were performed using a truck-mounted drill rig and were advanced utilizing HW and NW thin wall casing using the rotary-wash drilling technique. Standard 1-3/8 inch I.D. split spoon samples and standard penetration tests were obtained in general accordance with the procedures described in ASTM D1586. Samples were taken continuously through the upper 25 feet of overburden soils and at 5-foot intervals thereafter. Where the borings were able to be advanced through the weathered bedrock deposits without rock coring, samples were taken at 5-foot intervals.

To supplement the borings, seven (7) test pits (TP-1 through TP-7) were performed at the proposed wind turbine sites on August 30 and September 6, 2012. One (1) test pit was performed at each of the seven sites. The test pits were advanced to a depth 15 feet below the ground surface or to refusal on bedrock, whichever occurred first. The test pits were performed by a rubber-tired Case 580N Loader Backhoe. At each test pit, a composite sample of the fill was taken to be submitted for chemical analyses.

The explorations were monitored by a representative of McPhail who performed field layout, prepared field logs, obtained and visually classified soil samples, made minor adjustments to the exploration locations based on surface and subsurface conditions and determined the required exploration depths based upon the actual subsurface conditions encountered.

Field locations of the subsurface explorations were determined by taping from existing site features identified on the referenced existing conditions plans. The existing ground surface elevation at each exploration location was determined by a level survey performed by McPhail utilizing vertical control indicated on the referenced existing conditions plans.



To permit monitoring of groundwater levels across the site and the sampling of groundwater for chemical analyses, groundwater observation wells were installed in completed boreholes B-2 (OW), B-3 (OW), B-6 (OW), B-8 (OW), B-9 (OW), B-12 (OW), and B-13 (OW). One observation well was installed at each of the seven sites. Installation details of the observation wells are indicated on the notes section of the boring logs contained in Appendix B. Groundwater Monitoring Reports are presented in Appendix D.

**GEOTECHNICAL
LABORATORY
TESTING**

Following completion of the field explorations, the soil samples collected from the borings were submitted to a United States Army Corps of Engineers (USCOE) certified laboratory for more detailed classification, analyses and testing. The laboratory testing performed included moisture content and sieve analyses to determine the gradations and confirm the visual classifications of the overburden soil and weathered bedrock deposits. In total, twenty-eight (28) moisture content and sieve analyses were performed. Laboratory test procedures performed on the soil samples were in general accordance with ASTM D2216-05 and ASTM C136. Results of the moisture content and grain size distribution testing are presented in Appendix E.

Moisture content analyses were performed on boring samples of the fill, subsoil, mudline interface, organic, marine, glacial till, and weathered bedrock deposits. The range of measured moisture contents for each soil strata tested is summarized below:

<u>Strata</u>	<u>Moisture Content Range (%)</u>
Fill	5.9 to 16.8
Subsoil	7.5
Mudline Interface Deposit	19
Organic Deposit	14.8 to 481.7
Marine Deposit	9.8 to 69.7
Glacial Till Deposit	5.5 to 11.7
Weathered Bedrock Deposit	8.2 to 15



Laboratory tests were also performed on intact rock core samples to determine the unconfined compressive strength and splitting tensile strength of the rock cores. Laboratory test procedures performed on the intact rock cores were performed in general accordance with ASTM D3967 and ASTM D7012 Method C. Results of the rock core testing are presented in Appendix F.

Unconfined compressive strength tests were performed on a total of seven (7) intact rock core samples. The sample depth of the rock cores ranged from about 16 feet to 33 feet below existing grade. The results indicate that the unconfined compressive strength of the rock cores varies from about 1,460 pounds per square-inch (psi) to about 9,940 psi.

Splitting tensile strength tests were performed on a total of seven (7) intact rock core samples. The sample depth of the rock cores ranged from about 25 feet to 35 feet below existing grade. The results indicate that the splitting tensile strength of the of the rock cores varies from about 200 psi to about 1,940 psi.

CHEMICAL TESTING OF SOIL SAMPLES

A composite sample of fill material from each test pit was submitted for chemical analysis for the presence of TCLP (leachable) RCRA-8 metals, TCLP volatile organic compounds (VOCs), and TCLP semi-volatile organic compounds (SVOCs) in accordance with EPA Method 1311. Additional testing on the composite samples of the fill was performed for corrosivity, pH, electrical resistivity, and for the presence of asbestos. Testing on a composite sample of the organic deposit was performed for corrosivity, pH, and electrical resistivity. The soil analytical data is contained in Appendix G and is summarized in Table 1 following the text of this report. The following is a discussion of the chemical testing performed on soil samples.

TCLP RCRA-8 metals, TCLP VOCs, and TCLP SVOCs.

Seven (7) composite samples of the granular fill were analyzed for the presence of TCLP RCRA-8 metals, TCLP VOCs, and TCLP SVOCs. The presence of TCLP lead above the laboratory detection limit was reported in the sample obtained from test pit TP-1 performed at the Bishop's Rock



site at a concentration of 9.0 milligrams per liter (mg/l). For the remaining analyses, the results indicate that TCLP RCRA-8 metals, TCLP VOCs, and TCLP SVOCs were not reported above the applicable laboratory detection limits and EPA 1311 standards as indicated on Table 1.

Per 40 CFR 261.24, soil that exhibits a TCLP lead level greater than 5.0 mg/l is considered a characteristic hazardous waste. Hence, the fill material at the Bishop's Rock site sampled from test pit TP-1 that exhibited a TCLP lead level greater than 5.0 mg/l is considered to be a characteristic hazardous waste.

Corrosivity

Corrosivity testing for sulfate and chloride content was performed on six (6) samples of the granular fill and one (1) sample of the organic deposit in accordance with AASHTO Standards T 290-95 and T 291-94. The sulfate content of the fill samples was measured to range from none detected to 310 mg/kg. The chloride content of the fill samples was measured to range from 10 to 400 mg/kg.

The sulfate and chloride content of the organic deposit sample were measured at 1,630 and 2,840 mg/kg, respectively.

pH

The pH of the six (6) samples of the granular fill and one (1) sample of the organic deposit was measured in accordance with ASTM D4972. The pH of the fill samples in distilled water ranged from 4.6 to 6.3 standard units (S.U.). The pH of the fill samples in calcium chloride ranged from 4.3 to 6.3 S.U. The pH of the organic deposit sample in distilled water and calcium chloride was measured to be 6.6 and 6.2 S.U., respectively.

Electrical Resistivity

Electrical resistivity testing was performed on six (6) samples of the granular fill and one (1) sample of the organic deposit in accordance with ASTM G57. The electrical resistivity of the fill samples was measured to



range from 835 ohm-cm to 33,817 ohm-cm. The electrical resistivity of the organic deposit sample was measured to be 209 ohm-cm.

Asbestos

Seven (7) samples of the granular fill were analyzed for the presence of asbestos in accordance with the EPA/500/R-93/116 standards. An asbestos content of zero percent was reported in all samples.

CHEMICAL TESTING OF GROUNDWATER

Following the field investigations, groundwater samples were obtained from the observation wells installed in the completed boreholes and submitted for chemical analyses for the presence of TCLP (leachable) RCRA-8 metals, TCLP VOCs, and TCLP SVOCs in accordance with EPA Method 1311. The groundwater analytical data is contained in Appendix H and is summarized in Table 2 following the text of this report.

Specifically, groundwater samples were obtained from B-2 (OW) at Bishop's Rock, B-3 (OW) at Prichard Field North, B-6 (OW) at Prichard Field South, B-9 (OW) at Navy Lodge, and B-12 (OW) at Derecktor.

The results indicated that TCLP RCRA-8 metals, TCLP VOCs, and TCLP SVOCs were not reported above the applicable laboratory detection limits and EPA 1311 standards for all samples as indicated on Table 2.

Per 40 CFR 261.24, groundwater with filterable solids that exhibit a TCLP lead level greater than 5.0 mg/l is considered a characteristic hazardous waste. Hence, the groundwater sampled from the above referenced observation wells is not considered to be a characteristic hazardous waste.

SUBSURFACE CONDITIONS

A detailed description of the subsurface conditions encountered at each of the completed explorations is presented in the boring and test pit logs contained in Appendices B and C, respectively. A tabular summary of the subsurface conditions across the seven sites is presented in Table 3 following the text of this report. Rock core photographs are contained in Appendix F.



Soil and Rock Stratum and Groundwater

The following is a description of the generalized subsurface stratigraphy encountered at the seven proposed wind turbine sites.

Granular Fill

The surface treatments across the wind turbine sites are underlain by a granular fill deposit which was observed to typically consist of very loose to very dense, gray-black to gray-brown, silt and sand to sand and gravel. Numerous samples of the fill were observed to contain brick fragments, concrete, and wood chips. The surface of the granular fill was encountered in the explorations within 8-inches of the existing ground surface and was generally observed to vary from about 2 feet to 13 feet in thickness.

Mudline Interface

A mudline interface deposit was encountered in some of the explorations underlying the fill and was observed to consist of very loose to compact, gray-brown to gray-black, silt and sand varying to fine to medium sand with a trace of silt and gravel. The mudline interface deposit was observed to contain traces of organic matter. The surface of the mudline interface deposit was encountered at depths ranging from 8 feet to 22 feet below the existing ground surface and was observed to vary from about 1-foot to 3.5 feet in thickness, where encountered.

Organic Deposit

Generally encountered where a mudline interface deposit was not present, an organic deposit was encountered in some of the explorations underlying the fill and was observed to consist of very soft to soft, gray to dark gray organic silt with a trace of sand and gravel varying to peaty sand with some gravel. The surface of the organic deposit was encountered at depths ranging from 2 feet to 9 feet below existing grade and was observed to vary from about 1.5 feet to 10 feet in thickness, where encountered.



Marine Deposit

A marine deposit was encountered in some of the explorations underlying the fill, mudline interface, and/or organic deposits at depths ranging from 6 feet to 25.5 feet below existing grade. The marine deposit was typically comprised of loose to dense, gray-black to gray-green, fine to medium sand with varying amounts of silt and gravel. Where encountered, the marine deposit was observed to vary from about 1.5 feet to 12 feet in thickness.

Glacial Till Deposit

Encountered beneath the fill, organic, and/or marine deposit, some of the explorations encountered a glacial till deposit which was observed to consist of a compact to very dense, gray-black to mottled gray-brown and orange-brown, well-graded mixture of silt, sand and gravel. The surface of the glacial till deposit was encountered at depths ranging from 4 feet to 28 feet below the existing ground surface and was observed to vary from about 2 feet to 6.5 feet, where penetrated, and up to 15 feet thick where it was not penetrated.

Weathered Bedrock

The surface of the weathered bedrock was encountered in the explorations underlying the overburden soils at depths ranging from 2 feet to 22.5 feet below the existing ground surface. Based on split spoon samples and rock cores, the weathered bedrock was observed to typically consist of compact to very dense, gray-black, gray-brown, gray-green and/or orange-brown, very severely to completely weathered graywacke and/or schist. Where penetrated, the weathered bedrock deposit was observed to range from about 2.5 feet to 22 feet in thickness. Rock cores performed in the weathered bedrock deposit were classified as soft to medium hard and had a Rock Quality Designation (RQD) of zero percent.

Bedrock

Underlying the weathered bedrock, the explorations encountered sound bedrock at depths ranging from 14 to 26 feet below the existing ground



surface. Based on the rock core samples, the bedrock was typically observed to consist of medium hard to very hard, fresh to moderately weathered, sound to extremely fractured, interbedded gray-black amorphous graywacke, gray-green fine to medium grained schist, and gray fine to medium grained sandstone.

Groundwater

Groundwater was measured in the observation wells installed in the completed boreholes and in the completed test pit excavations at depths ranging from 3 feet to 14 feet below the existing ground surface. It is anticipated that future groundwater levels at the proposed wind turbine sites may vary from those reported herein due to primarily tidal fluctuations, but also due to normal seasonal changes, runoff particularly during or following periods of heavy precipitation, and alterations of existing drainage patterns.

Site Specific Subsurface Conditions

The following is a description of the site specific subsurface conditions encountered at each of the seven sites.

Bishop's Rock

Borings B-1 and B-2 (OW) and test pit TP-1 were performed at the Bishop's Rock site. The approximate exploration locations are as indicated on Figure 2A.

Underlying the existing ground surface, the explorations encountered an 8- to 13-foot thickness of fill. At boring B-1, the fill is underlain by a 3.5-foot thick mudline interface. At boring B-2 (OW), the fill was underlain by a 3-foot thick marine deposit.

At B-2 (OW) and TP-1, a glacial till deposit was encountered underlying the marine deposit or fill at depths of 16 feet and 9.5 feet below existing grade, respectively. TP-1 was terminated upon refusal on possible bedrock at a depth 10.5 feet below existing grade.



At borings B-1 and B-2 (OW), the surface of the weathered bedrock was encountered underlying the overburden soils at depths of 11.5 feet and 22.5 feet below existing grade, respectively.

Rock coring of bedrock commenced after borings B-1 and B-2 (OW) were advanced to practical roller bit refusal at depths of 14 feet and 24 feet below existing grade, respectively. Borings B-1 and B-2 (OW) were terminated in the bedrock at depths of 31.5 feet and 34 feet below existing grade, respectively.

Groundwater was measured in the observation well installed in boring B-2 (OW) at depths ranging from 5 feet to 7.9 feet below existing grade, corresponding to Elevation +2 to Elevation -0.9, respectively. Groundwater was not observed in TP-1 upon completion of the excavation.

Prichard Field North

Borings B-3 (OW) and B-4 and test pit TP-2 were performed at the Prichard Field North site. The approximate exploration locations are as indicated on Figure 2B.

Underlying the approximate 6-inch thickness of topsoil encountered at the site, the explorations encountered a 6- to 11.2-foot thickness of fill. At TP-1, a marine deposit was encountered underlying the fill at a depth 6 feet below existing grade. TP-1 was terminated in the marine deposit at a depth 15 feet below the existing ground surface.

Locally at boring B-4, the fill was underlain by an approximate 9-foot zone of cobbles and boulders. At B-3 (OW) and B-4, the surface of the weathered bedrock was encountered underlying the overburden soils at depths of 9 feet and 20 feet below existing grade, respectively.

Rock coring of bedrock commenced after borings B-3 (OW) and B-4 were advanced to practical roller bit refusal at depths of 14 feet and 26 feet below existing grade, respectively. Borings B-3 (OW) and B-4 were terminated in the bedrock at depths of 24 feet and 36 feet below existing grade, respectively.



Groundwater was measured in the observation well installed in boring B-3 (OW) at depths ranging from 5.8 feet to 7.2 feet below existing grade, corresponding to Elevation +1.8 to +0.4, respectively. Upon completion of the excavation, groundwater was observed in TP-2 at a depth 8 feet below existing grade, corresponding to Elevation -0.3.

Prichard Field South

Borings B-5 and B-6 (OW) and test pit TP-3 were performed at the Prichard Field South site. The approximate exploration locations are as indicated on Figure 2C.

Underlying an approximate 3- to 6-inch thickness of topsoil, the explorations encountered an 8- to 9-foot thickness of fill. At boring B-5, a 2-foot thick mudline interface was encountered underlying the fill followed by a 4-foot thick marine deposit. At B-6 (OW) and TP-3, the fill was underlain by a 1.5- to 4-foot thick organic deposit

Beneath the marine or organic deposits, the explorations encountered a glacial till deposit at depths ranging from 10.5 feet to 14 feet below existing grade. Where penetrated in the borings, the glacial till deposit was observed to be 1.5 and 2 feet in thickness. TP-3 was terminated in the glacial till deposit at a depth 15 feet below the existing ground surface.

Borings B-5 and B-6 (OW) encountered the surface of the weathered bedrock underlying the overburden soils at depths of 15.5 feet and 14 feet below existing grade, respectively.

Rock coring of bedrock commenced after the borings were advanced to practical roller bit and split spoon refusal at a depth 25 feet below existing grade. The borings were terminated in the bedrock at a depth 35 feet below existing grade.

Groundwater was measured in the observation well installed in boring B-6 (OW) at depth ranging from 3.1 feet to 5.6 feet below existing grade, corresponding to Elevation +2.6 to Elevation +0.1, respectively. Upon



completion of the excavation, groundwater was observed in TP-3 at a depth 9 feet below existing grade, corresponding to Elevation -3.2.

Coddington Point

Borings B-7 and B-8 (OW) and test pit TP-4 were performed at the Coddington Point site. The approximate exploration locations are as indicated on Figure 2D.

Underlying an approximate 2- to 6-inch thickness of topsoil, the explorations encountered a 2- to 4-foot thickness of fill. Underlying the fill at B-8 (OW), a 2-foot thick subsoil deposit was encountered which was comprised of compact, yellow-brown, silt and sand with a trace of gravel. The subsoil was underlain by a 4-foot thick glacial till deposit.

Borings B-7 and B-8 (OW) encountered the surface of the weathered bedrock underlying the overburden soils at depths of 2 feet and 8 feet below existing grade, respectively. TP-4 was terminated upon refusal on possible bedrock at a depth 4 feet below existing grade.

Rock coring of bedrock commenced after borings B-7 and B-8 (OW) were advanced to practical roller bit refusal at depths of 16 feet and 14 feet below existing grade, respectively. Borings B-7 and B-8 (OW) were terminated in the bedrock at depths of 26 feet and 24 feet below existing grade, respectively.

Groundwater was measured at the observation well installed in boring B-8 (OW) at depths ranging from 13 feet to 18 feet below existing grade, corresponding to Elevation +9.5 to Elevation +4.5, respectively. Groundwater was not observed in TP-4 upon completion of the excavation.

Navy Lodge

Borings B-9 (OW) and B-10 and test pit TP-5 were performed at the Navy Lodge site. The approximate exploration locations are as indicated on Figure 2E.



Underlying an approximate 2- to 6-inch thickness of topsoil, the explorations encountered a 2- to 11-foot thickness of fill.

At boring B-9 and test pit TP-5, an organic deposit was encountered beneath the fill at depths of 2 feet and 5 feet below the ground surface, respectively. The organic deposit was observed to extend to a depth 10 feet below existing grade at B-9 (OW). TP-5 was terminated in the organic deposit at a depth 15 feet below the existing ground surface.

Underlying the fill and/or organic deposits at depths ranging from 10 to 11 feet below existing grade, the borings encountered an 11- to 12-foot thick marine deposit.

The borings encountered the surface of the weathered bedrock underlying the overburden soils at depth 22 feet below existing grade.

Rock coring of bedrock commenced after borings B-9 (OW) and B-10 were advanced with moderate effort to a depth of 30 feet below existing grade; roller bit refusal was not obtained. Borings B-9 (OW) and B-10 were terminated in the weathered bedrock deposit at depths of 35 feet and 40 feet below existing grade, respectively.

Groundwater was measured at the observation well installed in boring B-9 (OW) at depths ranging from 2.8 feet to 4.3 feet below existing grade, corresponding to Elevation +2.3 to Elevation +0.8, respectively. Upon completion of the excavation, groundwater was observed in TP-5 at a depth 4 feet below existing grade, corresponding to Elevation +0.8.

Derecktor

Borings B-11 and B-12 (OW) and test pit TP-6 were performed at the Derecktor site. The approximate exploration locations are as indicated on Figure 2F.

Underlying an approximate 2- to 3-inch thickness of topsoil, and directly beneath the ground surface at B-11, the explorations encountered a 7- to 16-foot thickness of miscellaneous granular fill. The granular fill is underlain by a blasted bedrock fill, which was observed in the borings to



extend to a depth 20 to 22 feet below the existing ground surface. TP-6 was terminated in the blasted bedrock fill at a depth 15 feet below existing grade. The blasted bedrock fill was observed to typically consist of a loose to dense, gray-black, well-graded mixture of silt, sand, and gravel containing pieces of intact shale and weathered bedrock.

At TP-6, an abandoned concrete footing bearing on the surface of the blasted bedrock fill was observed. An abandoned ductile iron pipe was also observed in the excavation.

The fill encountered in the borings is underlain by a 1- to 3.5-foot thick mudline interface. Beneath the mudline interface at depths ranging from 21 feet to 25.5 feet below existing grade, the borings encountered a 1.5- to 7-foot thick marine deposit.

Underlying the marine deposit at depths ranging from 27 feet to 28 feet below existing grade, the borings encountered a glacial till deposit. B-11 and B-12 (OW) were terminated in the glacial till deposit at depths of 41.4 feet and 42 feet below the existing ground surface, respectively.

Groundwater was measured in the observation well installed in boring B-12 (OW) at depths ranging from 14 feet to 15.1 feet below existing grade, corresponding to Elevation +0.7 to Elevation -0.4, respectively. Groundwater was not observed in TP-5 upon completion of the excavation.

NUWC

Borings B-13 (OW) and B-14 and test pit TP-7 were performed at the NUWC site. The approximate exploration locations are as indicated on Figure 2G.

Underlying an approximate 1- to 2-inch thickness of topsoil, the explorations encountered a 2- to 2.5-foot thickness of fill.

The explorations encountered the surface of the weathered bedrock directly underlying the fill. Locally at B-14, a 4-foot thick zone of very loose weathered bedrock was encountered at a depth 10 feet below the



existing ground surface. The loose zone of weathered bedrock was observed to consist of very loose, mottled gray-black and orange-brown, very severely to completely weathered graywacke. TP-7 was terminated upon refusal in the weathered bedrock at a depth 10 feet below existing grade. B-13 (OW) was terminated in the weathered bedrock at a depth 35.5 feet below the ground surface; roller bit or split spoon refusal was not obtained.

Rock coring commenced after boring B-14 was advanced with significant effort to a depth of 25 feet below existing grade; roller bit refusal was not obtained. Boring B-14 was terminated in the bedrock deposit at a depth of 35 feet below existing grade.

Groundwater was measured in the observation well installed in boring B-13 (OW) at depths ranging from 3 feet to 18.7 feet below existing grade, corresponding to Elevation +40.8 to Elevation +25.1, respectively. Groundwater was not observed in TP-7 upon completion of the excavation.

FOUNDATION DESIGN RECOMMEN- DATIONS

Based on our current understanding of the proposed development, the structural loads provided to us, and the subsurface soil, rock and groundwater conditions as characterized above, it is recommended that foundation support of the proposed wind turbine structures transfer the structural load through the existing fill, subsoil, and compressible organic and mudline interface soils to the underlying natural, inorganic marine, glacial till, weathered bedrock, and/or bedrock deposits that underlie the proposed wind turbine sites.

In consideration of the variable subsurface conditions documented across the individual wind turbine sites, namely the presence of the thicker fill and organic deposits at certain sites, two types of foundation systems are recommended for the proposed wind turbine structures: shallow foundations consisting of structural mats, and deep foundations consisting of drilled micropiles or socketed drilled shafts.

The sites where the subsurface conditions are considered appropriate for the use of structural mats for foundation support include Coddington Point



and NUWC. The sites where foundation support utilizing drilled micropiles or socketed drilled shafts are considered appropriate include Bishop's Rock, Prichard Field North, Prichard Field South, Navy Lodge, and Derecktor.

Detailed recommendations associated with the use of structural mats, drilled micropiles, and socketed drilled shafts for foundation support are contained below.

Structural Mats

The explorations performed at the Coddington Point site encountered the surface of the natural glacial till or weathered bedrock deposits at depths ranging from 2 feet to 4 feet below the existing ground surface. The explorations performed at the NUWC site encountered the surface of the weathered bedrock deposit at depths ranging from 2 feet to 2.5 feet below existing grade.

Therefore, the wind turbine structures to be constructed at the Coddington Point and NUWC sites could be founded on structural mats bearing directly on the undisturbed glacial till deposit, weathered bedrock, or on compacted structural fill placed directly over the surface of the glacial till deposit or weathered bedrock at locations where the surface of the glacial till or weathered bedrock is located below the design bottom of mat elevation. It is recommended that the mats be proportioned utilizing a maximum design bearing pressure of eight (8) kips per square-foot (ksf).

In the event that the mat design method required a coefficient of subgrade reaction, we recommend the following range of modulus of subgrade reaction values be used: 300 pounds per cubic-inch (pci) to 400 pci based on a one-foot square plate. However, the modulus of subgrade reaction for the specific method of analysis being used should be based on the actual size of the mat's bearing/reaction area.

All mats should be provided with a minimum 35-inch thickness of soil cover as frost protection per Table E-1 in UFC 3-301-01.



All mats should be located such that they are below a theoretical line drawn upward and outward at 2 to 1 (horizontal to vertical) from the bottom exterior edge of all adjacent existing or proposed footings, structures, and utilities.

Where proposed mats are to be supported on structural fill, the lateral limits of the excavation should extend beyond the outside edge of the mat for a horizontal distance equal to the depth from the bottom of the proposed mat to the surface of the undisturbed glacial till or weathered bedrock deposit, plus two feet in all plan directions.

Structural fill placed should consist of an off-site well-graded, natural sand and gravel containing less than 8 percent passing the No. 200 sieve. All structural fill should be placed in lifts having a compacted thickness of 6 inches and be compacted to a minimum of 95 percent of its maximum modified Proctor dry density. The placement and compaction of structural fill should be monitored by a registered design professional or his designated representative in accordance with the provisions of the Code.

Support of the proposed wind turbine structures on the glacial till and/or bedrock deposits should not result in future detrimental settlement of the structures, since the glacial till and bedrock deposits are relatively incompressible. Post construction settlements of the structures are anticipated to be within the normally acceptable design criterion of 1-inch of total settlement.

Drilled Micropiles (a.k.a. Mini-Piles and Small Diameter Grouted Piles)

Foundation support for the wind turbine structures constructed at Bishop's Rock, Prichard Field North, Prichard Field South, Navy Lodge, and Derecktor could consist of 50-ton design capacity drilled micropiles.

The drilled micropiles should have a maximum design capacity of 50 tons in compression. The capacity of the micropiles should be mobilized through side friction in the glacial till, weathered bedrock, and bedrock deposits underlying the wind turbine sites. The drilled micropiles should have a minimum diameter of 8 inches. The preliminary required embedment of the micropiles can be determined using an allowable side



friction resistance of 4 ksf. The actual required embedment of the micropiles in the glacial till and/or bedrock should be determined by the pile contractor based on their experience and pile installation methods and confirmed by the performance of a load test at each site. A pile load test is required per the provisions of Section 1810.3.3.1.2 of the Code.

Each micropile should be provided with steel reinforcing capable of carrying a minimum of 40 percent of the design pile compressive load utilizing 40 percent of the specified yield strength of the steel up to a maximum of 30,000 psi. The grout should be placed by tremie methods under a minimum 100 psi pressure head. The allowable design compressive load on the grout should not exceed 33 percent of its 28-day compressive strength. The micropiles should be analyzed, designed, detailed, and installed in accordance with Sections 1810.1 through 1810.4 of the Code, as applicable.

The minimum spacing between individual micropiles should not be less than 2.5 feet. The piles should be installed within a temporary casing that extends, at a minimum, into the surface of the glacial till or weathered bedrock deposits, whichever is encountered first. Centralizers spaced on maximum 15-foot centers should be provided along the pile length to ensure a minimum of 2.5 inches of grout cover beyond the outer edge of the pile's reinforcing steel for the uncased portion of the pile and a minimum of 1.5 inches of grout cover for the portion embedded in rock.

The drilled piles should be braced to provide lateral stability in all directions in accordance with Section 1810.2.2 of the Code. Pile connections into the pile caps should be designed in accordance with Section 1810.3.11 of the Code. All pile caps should be provided with a minimum 35-inch thickness of soil cover as frost protection per Table E-1 in UFC 3-301-01.

Socketed Drilled Shafts (a.k.a. Caissons)

Foundation support for the wind turbine structures could consist of socketed drilled shafts that derive their support through a combination of side friction and end bearing in the glacial till, weathered bedrock, and/or bedrock deposits. The socketed drilled shafts should be analyzed,



designed, detailed, and installed in accordance with Sections 1810.1 through 1810.4 of the Code, as applicable.

Socketed drilled shafts consist of a permanent pipe or tube casing that extends down to the surface of the glacial till or bedrock and an uncased socket drilled into the glacial till or bedrock, both filled with concrete. Each socketed drilled shaft should be provided with a full length structural steel core.

The allowable compressive stress carried by the structural steel core and steel pipe should not exceed 50 and 35 percent of the specified yield strength of the steel, up to a maximum of 32,000 psi and 16,000 psi, respectively. Socketed drilled shafts should be filled with concrete having a 28-day specified compressive strength of not less than 4,000 psi. The allowable compressive stress carried by the concrete should not exceed 33 percent of the 28-day compressive strength.

The socketed drilled shafts should be designed utilizing a maximum allowable side friction resistance of 3 ksf and an allowable end bearing resistance of 8 ksf. The depth of the socketed portion of the drilled shaft should be sufficient to develop the full load-bearing capacity of the drilled shaft. The socketed drilled shafts should be proportioned such that not more than 50 percent of the design load is resisted in end bearing. The depth of the socket should also be greater than the outside diameter of the pipe.

Reinforcing steel in socketed drilled shafts should be provided with a minimum of 2.5 inches of concrete cover beyond the outer edge of the reinforcing steel for the uncased portion of the drilled shaft and a minimum of 1.5 inches of concrete cover for the portion embedded in rock.

Considerations for Lateral and Uplift Forces

Lateral forces can be transmitted from the structure to the soil by passive pressure on the below-grade mats and pile caps utilizing an equivalent fluid density of 120 pounds per cubic-foot providing that these structural elements are designed to resist these pressures.



At the Navy Lodge site, the explorations encountered an organic deposit at depths ranging from 2 feet to 5 feet below existing grade. Should the subgrade for a pile cap be located in an organic deposit, it will be necessary to overexcavate the surrounding organic soil and replace it with compacted structural fill to mobilize the recommended passive resistance detailed above. The limits of the excavation should be advanced to the pile cap subgrade elevation, and should extend beyond the outside edge of the pile cap for a horizontal distance equal to two times the depth of the pile cap in all plan directions. The passive resistance of the soil should be neglected if overexcavation is not performed.

Lateral forces can also be considered to be transmitted from the structure to the soil by friction on the base of mats using a frictional coefficient of 0.4 for mats bearing on glacial till and 0.5 for mats bearing on weathered bedrock, to which a factor of safety of 1.5 should be applied.

The micropiles may be utilized to resist lateral forces provided that they are provided with a permanent steel casing. The permanent steel casing should extend at least 15 feet below the bottom of the pile cap. The allowable lateral capacity of an individual micropile will be dependent on the diameter, wall thickness, and steel grade of the permanent casing, the specific soil conditions at each proposed turbine site, and the degree of fixity of the micropiles to the pile cap.

Due to the relatively limited lateral capacity of micropiles, at sites where organic soils are present, or if the lateral loads imposed by the wind turbine structure are considerable, caissons may be required.

The allowable design tensile stress for the steel reinforcement in micropiles should not exceed 60 percent of the specified yield strength of the steel. The allowable design tensile stress for the grout should be zero. Micropiles could be utilized to resist uplift forces provided that they are designed in accordance with Sections 1810.3.3.1.5 and 1810.3.3.1.6 of the Code.

At the Coddington Point and NUWC sites, where foundation support of the anticipated compressive loads is recommended utilizing mat



foundations, resistance to uplift forces may be obtained by installing tie-down anchors developing their capacity in the underlying weathered bedrock and bedrock deposits. Alternatively, micropiles may be installed at the Coddington Point and NUWC sites for the purpose of resisting only uplift forces.

Soil Corrosivity Recommendations

The American Association of State Highway and Transportation Officials (AASHTO) and the American Concrete Institute (ACI) have developed guidance to characterize the corrosivity of soil on subsurface utilities, piles, and concrete based on a variety of parameters, including soil resistivity, chloride concentration, sulfate concentration, and pH. As indicated in Section 10.7.5 of the Fourth Edition of the AASHTO LRFD Bridge Design Specifications, the following are recommended threshold criteria which establish soil conditions at a site as being indicative of a potential corrosion situation. The sampled soil at a site was considered to be corrosive if any of the following criteria exist for the representative soil samples taken at the site.

- Resistivity less than 2000 ohm-cm
- Sulfate concentrations greater than 1000 mg/kg
- pH less than 5.5 for inorganic soils or pH between 5.5 and 8.5 for soils with high organic content

Furthermore, additional minimum requirements for concrete mixtures applicable to each site were determined in accordance with Sections 4.2 and 4.3 of ACI 318-05, Building Code Requirements for Structural Concrete. ACI specifies additional minimal requirements for concrete mixtures based on exposure to chlorides and sulfate concentration in soil.

Based on the results of the corrosion analyses, the soil represented by the granular fill samples taken at the Bishop's Rock, Prichard Field North, Prichard Field South, Coddington Point, and NUWC sites is considered to be corrosive. Also, the soil represented by the organic soil sample taken from the Navy Lodge site is also considered to be corrosive.



It is recommended that steel pipes and utilities installed at these sites be provided with cathodic protection or a sacrificial thickness of excess steel beyond design requirements, a.k.a. corrosion allowance, of a 1/16-inch thickness on all exposed surfaces. Permanent steel casing for micropiles designed to resist axial and/or lateral load should also be provided with a 1/16-inch thickness of corrosion allowance on all exposed surfaces.

Based on the results of the chloride and sulfate concentration testing, additional minimum requirements for concrete mixtures at each site were determined based on the requirements indicated in ACI 318-05 Tables 4.2.2 and 4.3.1, which are included below as reference.

ACI 318-05 Table 4.2.2: Requirements for Special Exposure Conditions

Exposure condition	Maximum water-cementitious material ratio*, by weight, normal weight concrete	Minimum f _c , normal weight and lightweight concrete, psi*
Concrete intended to have low permeability when exposed to water	0.50	4000
Concrete exposed to freezing and thawing in a moist condition or to deicing chemicals	0.45	4500
For corrosion protection of reinforcement in concrete exposed to chlorides from deicing chemicals, salt, salt water, brackish water, seawater, or spray from these sources.	0.40	5000

* When both Table 4.3.1 and Table 4.2.2 are considered, the lowest applicable maximum water-cementitious material ratio and highest applicable minimum f_c shall be used.

**ACI 318-05 Table 4.3.1:
Requirements for Concrete Exposed to Sulfate-Containing Solutions**

Sulfate exposure	Water soluble sulfate (SO ₄) in soil, percent by weight	Sulfate (SO ₄) in water, ppm	Cement type	Maximum water-cementitious material ratio, by weight, normal weight concrete*	Minimum f _c , normal weight and lightweight concrete, psi*
Negligible	0.00 ≤ SO ₄ < 0.10	0 ≤ SO ₄ < 150	---	---	---
Moderate †	0.10 ≤ SO ₄ < 0.20	150 ≤ SO ₄ < 1500	II, IP(MS), IS(MS), P(MS), I(PM)(MS), I(SM)(MS)	0.5	4000
Severe	0.20 ≤ SO ₄ ≤ 2.00	1500 ≤ SO ₄ ≤ 10,000	V	0.45	4500
Very severe	SO ₄ > 2.00	SO ₄ > 10,000	V plus pozzolan ‡	0.45	4500

* When both Table 4.3.1 and Table 4.2.2 are considered, the lowest applicable maximum water-cementitious material ratio and highest applicable minimum f_c shall be used.

† Seawater.

‡ Pozzolan that has been determined by test or service record to improve sulfate resistance when used in concrete containing Type V cement.



Due to the proximity of the sites to a salt water body, it is recommended that concrete mixtures utilized at each site have a maximum water-cementitious material ratio of 0.40 and a minimum 28-day concrete compressive stress of 5,000 psi.

The results of the testing indicate that the soil represented by the granular fill samples have sulfate contents corresponding to a "Negligible" sulfate exposure as defined in Table 4.3.1. The soil represented by the organic soil sample from the Navy Lodge site has a sulfate content corresponding to a "Moderate" sulfate exposure.

Additionally, it is recommended that reinforcing steel in footings and pile caps be provided with a minimum of 3 inches of concrete cover.

SEISMIC DESIGN CONSIDERATIONS

The "Site Classification for Seismic Design" procedures contained in Section 1613.5.5 of the Code were utilized to determine the Site Class. In consideration of the varying subsurface conditions at each proposed wind turbine site, it was necessary to determine the Site Class for each site.

For the purposes of determining parameters for structural seismic design, the Bishop's Rock, Prichard Field North, Coddington Point, Derecktor and NUWC sites are considered to be a Site Class C as defined in Section 1613.5.2 of the Code. The Prichard Field South and Navy Lodge sites are considered to be a Site Class D as defined in Section 1613.5.2 of the Code.

As indicated above, bedrock was encountered at the Coddington Point and NUWC sites within 10 feet of the anticipated proposed bottom of mat foundations. Therefore, the provisions of Section 1613.5.5 of the Code indicate that a Site Class A or B may be applicable to these sites; however, in-situ shear wave velocity measurements of the bedrock would need to be obtained to confirm that the average shear wave velocity profile meets the definition of either Site Class A or B. The potential cost savings related to revising the Site Class should be evaluated to determine if the cost of the shear wave testing and engineering analysis is justifiable.



Values of mapped earthquake spectral response acceleration for the sites were obtained from Table E-2 in UFC 3-301-01. The mapped earthquake spectral response acceleration at short period (S_s) and at 1-second period (S_1) are 21% and 6%, respectively, for the seven sites.

The bearing strata at the seven sites is not considered subject to liquefaction during an earthquake.

GEOTECHNICAL CONSTRUCTION CONSIDERATIONS

The primary geotechnical construction considerations include, preparation of the mat foundation bearing surfaces, rock excavation, drilled micropile and caisson installation, dewatering, and off-site disposal of excess excavated material.

Preparation of the pad for support of the wind turbine mat foundations at the Coddington Point and NUWC sites should include the removal of all existing site improvements, topsoil, and fill material from the entire proposed wind turbine foundation footprint and within the plan limits described herein to the surface of the natural undisturbed glacial till or bedrock followed by the placement of compacted structural fill.

All soil bearing surfaces should be excavated with a backhoe bucket which has either a smooth, toothless cutting edge, or a steel plate welded across the teeth to maintain the excavated bearing stratum in an undisturbed condition. Bearing surfaces consisting of structural fill should be compacted to a minimum of 95 percent of its maximum modified Proctor dry density.

Furthermore, it is recommended that as soon as the mat bearing surfaces are exposed, they should be immediately covered with a 6-inch thickness of compacted 3/4-inch crushed stone to prevent disturbance of the mat subgrade during subsequent forming operations.

In consideration of the density of the weathered bedrock encountered at the Coddington Point and NUWC sites, excavation into the weathered bedrock deposit to mat subgrade should be able to be performed utilizing a CAT 330 excavator or equivalent.



All loose and/or displaced rock fragments should be removed from the surface of the weathered bedrock bearing surfaces. In addition, bearing surfaced consisting of weathered bedrock should be leveled to a maximum slope of 1 vertical to 12 horizontal across the mat area. Weathered bedrock encountered at the design foundation bearing elevation should be removed to a depth of 6 inches below the bottom of mat elevation and replaced with crushed stone to the underside of the mat.

In consideration of the subsurface conditions described previously, the remains of former structures within the fill deposit may be encountered which impact the installation of drilled mini-piles or caissons at the Bishop's Rock, Prichard Field North, Prichard Field South, Navy Lodge, and Derecktor sites. Hence, it may be necessary to excavate to remove the obstruction, drill through the obstruction, or relocate the piles around the obstruction, depending upon its depth and lateral limits.

Prior to the pile installation, the Contractor should make provisions to contain and dispose of the excess drilling fluid, grout, and other drilling spoil generated by the pile installation. It is recommended that the micropile installation be conducted within the excavation for the pile caps to contain drilling spoil and grout.

Due to the moderately high silt content of portions of the on-site soils, proper control of groundwater and surface water will be necessary to maintain a firm subgrade to support construction traffic. Even with proper control of both surface water and groundwater, it is probable that during periods of wet weather off-site gravel fill and/or crushed stone may be required to maintain trafficability for construction equipment.

It is anticipated that portions of the excavated granular soils may be re-used on-site as ordinary fill, provided it is maintained in a dry condition and can be properly compacted. The fill material could be re-used to backfill around the foundations of the wind turbine structures.

It is emphasized that excavated soil will be unsuitable for re-use if the soils become too wet. Therefore, it is recommended that stockpiles of excavated material intended for reuse be protected against increases in



moisture content by securely covering the stockpiles at all times when they are not in use. The placement and compaction of the fill material should be completed during relatively dry and non-freezing conditions. If, due to any of the above conditions, the excavated material is unsuitable for reuse, an off-site gravel fill should be used.

Furthermore, the moderately high silt content of the soils that underlie the project site make them highly susceptible to disturbance during the construction period in the presence of moisture. It is considered imperative that the groundwater be cut-off and/or diverted at the perimeter of the proposed excavation to minimize the disturbance of the bearing surfaces and to maximize the reusability of the excavated on-site soils. Therefore, attention should be given to providing positive drainage to direct surface water away from the excavation at all times.

In general, it is anticipated that dewatering by means of strategically located sumps and trenches should suffice during foundation construction operations. In addition, trapped surface water is anticipated to accumulate within localized depressions in the ground surface across the site after periods of heavy precipitation and will most likely necessitate localized sumping. Based on the results of the chemical testing of groundwater samples, groundwater accumulated on-site during foundation construction could be discharged into an on-site recharge system.

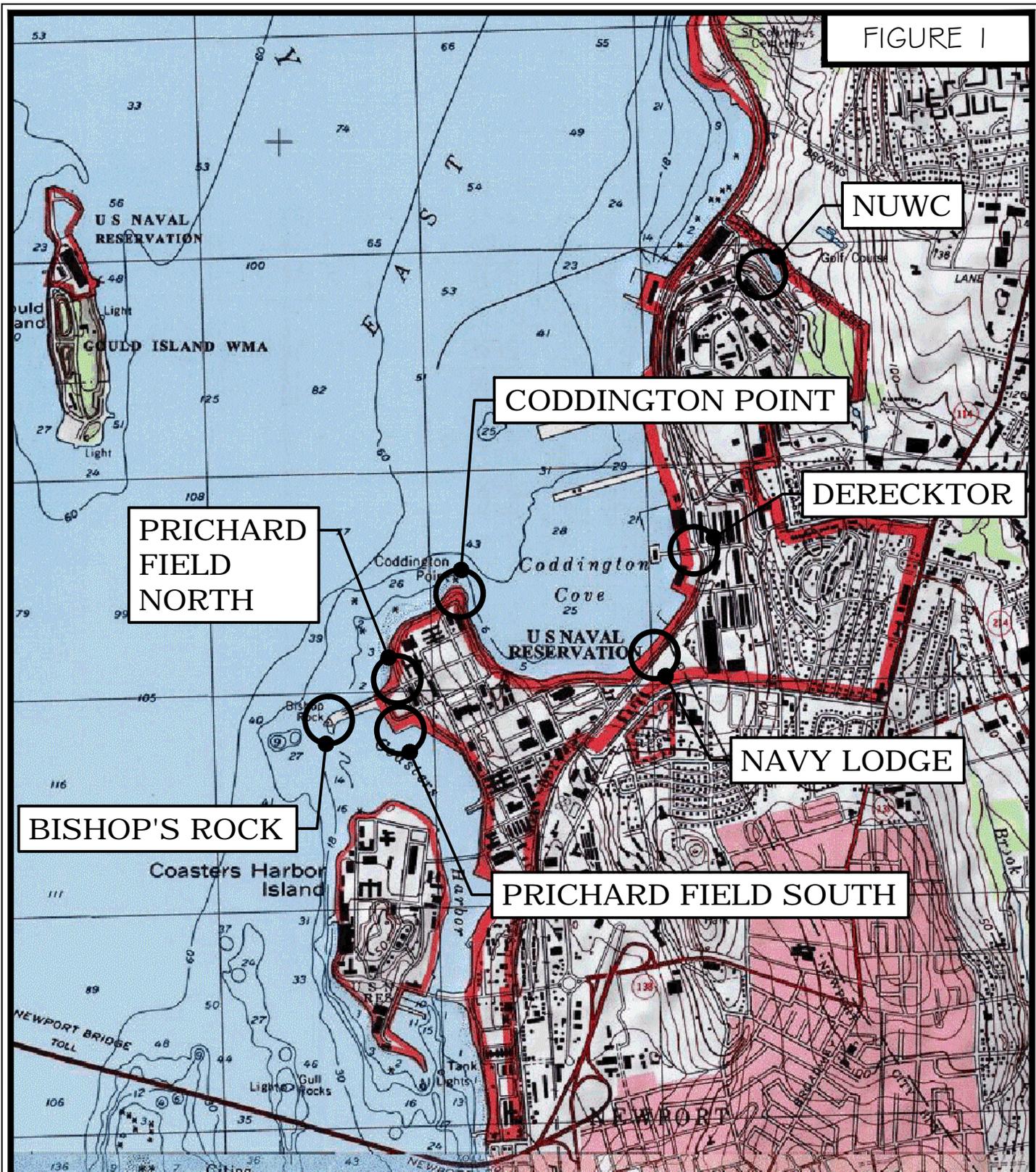
In consideration of the excavation required for mats and pile caps and the spoils generated during installation of micropiles and caissons, excess excavated soil may be generated during foundation construction operations. It is recommended that excess soils be reused on-site to the maximum extent possible. Off-site disposal of the excess material may require further environmental characterization of the excavated soil prior to its disposal to determine the appropriate type of receiving facility.

The fill material at the Bishop's Rock site sampled from test pit TP-1 exhibited a TCLP lead level greater than 5.0 mg/l and therefore is considered to be a characteristic hazardous waste as defined in 40 CFR 261.24. Currently the material would require off-site disposal at a RCRA Subtitle C facility as hazardous waste if it were excavated. However, on-

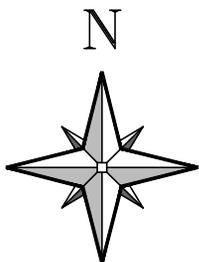


site stabilization treatment could be performed to potentially reduce the level of TCLP lead to below 5.0 mg/l. Upon completion of successful stabilization treatment, the soil would not be considered hazardous material and may be disposed of off-site at a non RCRA Subtitle C facility.

FIGURE 1



McPHAIL ASSOCIATES, LLC
 Geotechnical and Geoenvironmental Engineers
 2269 Massachusetts Avenue
 Cambridge, MA 02140
 617/868-1420
 617/868-1423 (Fax)



SCALE 1:25,000

PROJECT LOCATION PLAN

NAVAL STATION NEWPORT
 WIND TURBINE SITES

NEWPORT

RHODE ISLAND

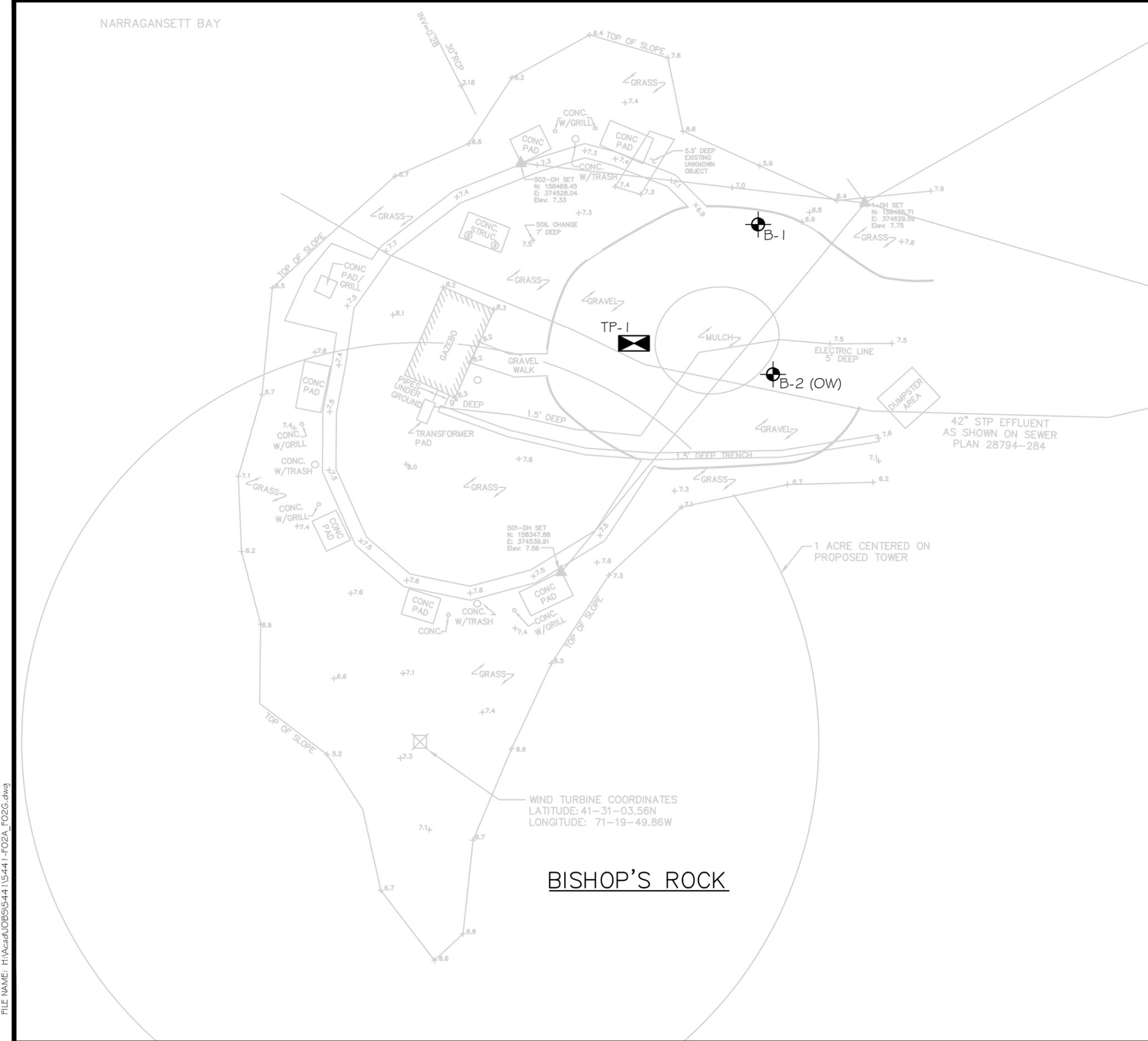
NARRAGANSETT BAY



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



FILE NAME: H:\Acad\JOBS\5441\5441-FO2A_F02G.dwg

<p>McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)</p>	NAVAL STATION NEWPORT WIND TURBINE SITES	
	NEWPORT	RHODE ISLAND
	SUBSURFACE EXPLORATION PLAN: BISHOP'S ROCK	
	FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC	
Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.
Project No: 5441	Scale: SEE PLAN	

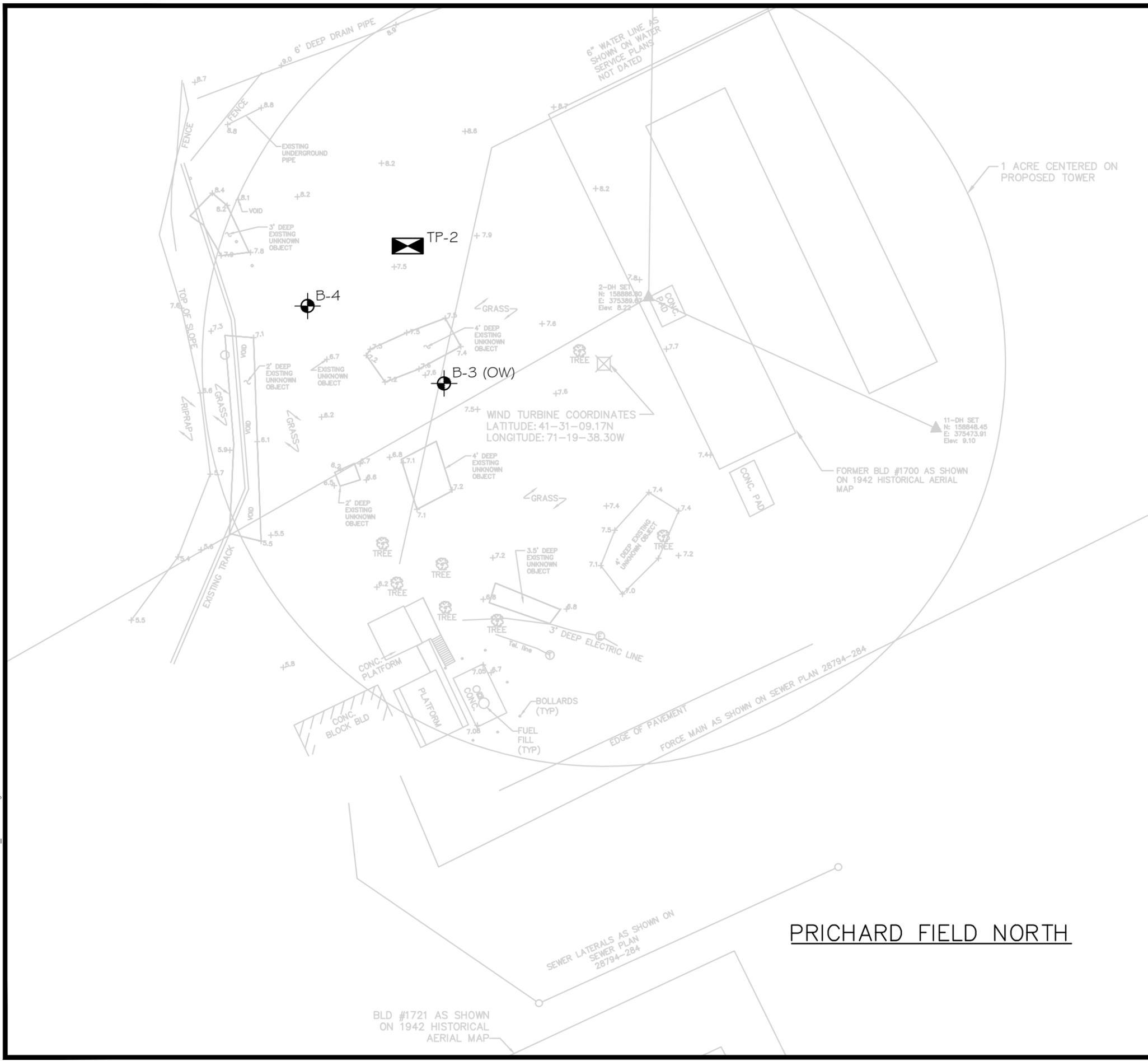
FIGURE 2B



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



PRICHARD FIELD NORTH

FILE NAME: H:\Acad\JOBS\5441\5441-F02A_F02G.dwg

<p>McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)</p>	NAVAL STATION NEWPORT WIND TURBINE SITES NEWPORT RHODE ISLAND		
	SUBSURFACE EXPLORATION PLAN: PRICHARD FIELD NORTH		
	FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC		
	Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.
Project No: 5441			

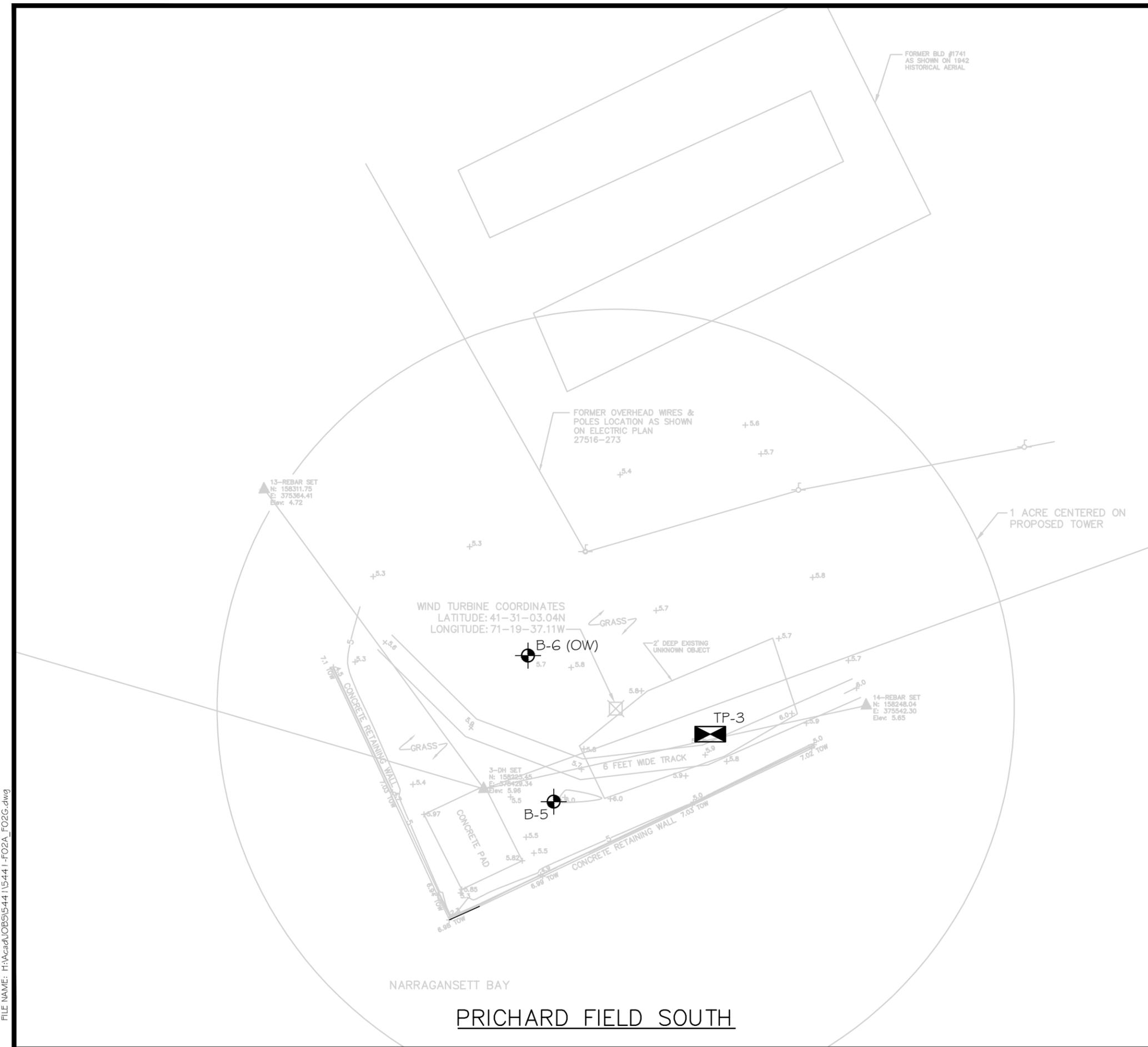
FIGURE 2C



LEGEND

-  — APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
-  — APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, PRELIMINARY, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



FILE NAME: H:\Acad\JOBS\5441\5441-FO2A_F02G.dwg

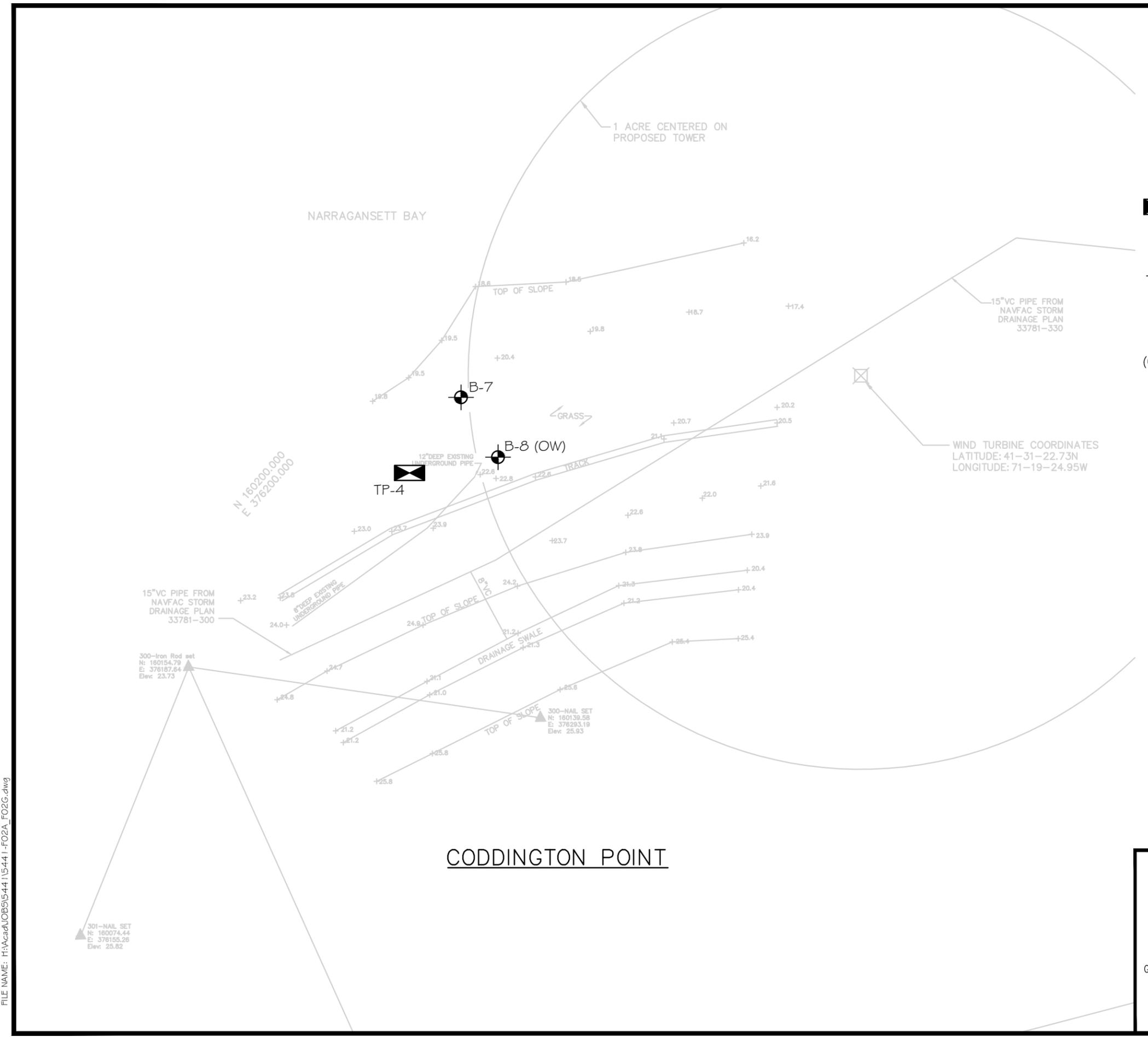
 <p>McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)</p>	NAVAL STATION NEWPORT WIND TURBINE SITES		
	NEWPORT		RHODE ISLAND
	SUBSURFACE EXPLORATION PLAN: PRICHARD FIELD SOUTH		
	FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC		
Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.	Scale: SEE PLAN
Project No: 5441			



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



CODDINGTON POINT

FILE NAME: H:\Acad\JOBS\5441\5441-F02A_F02G.dwg

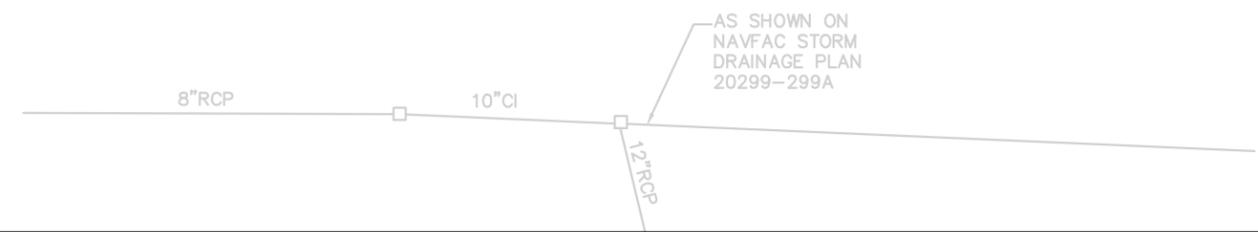
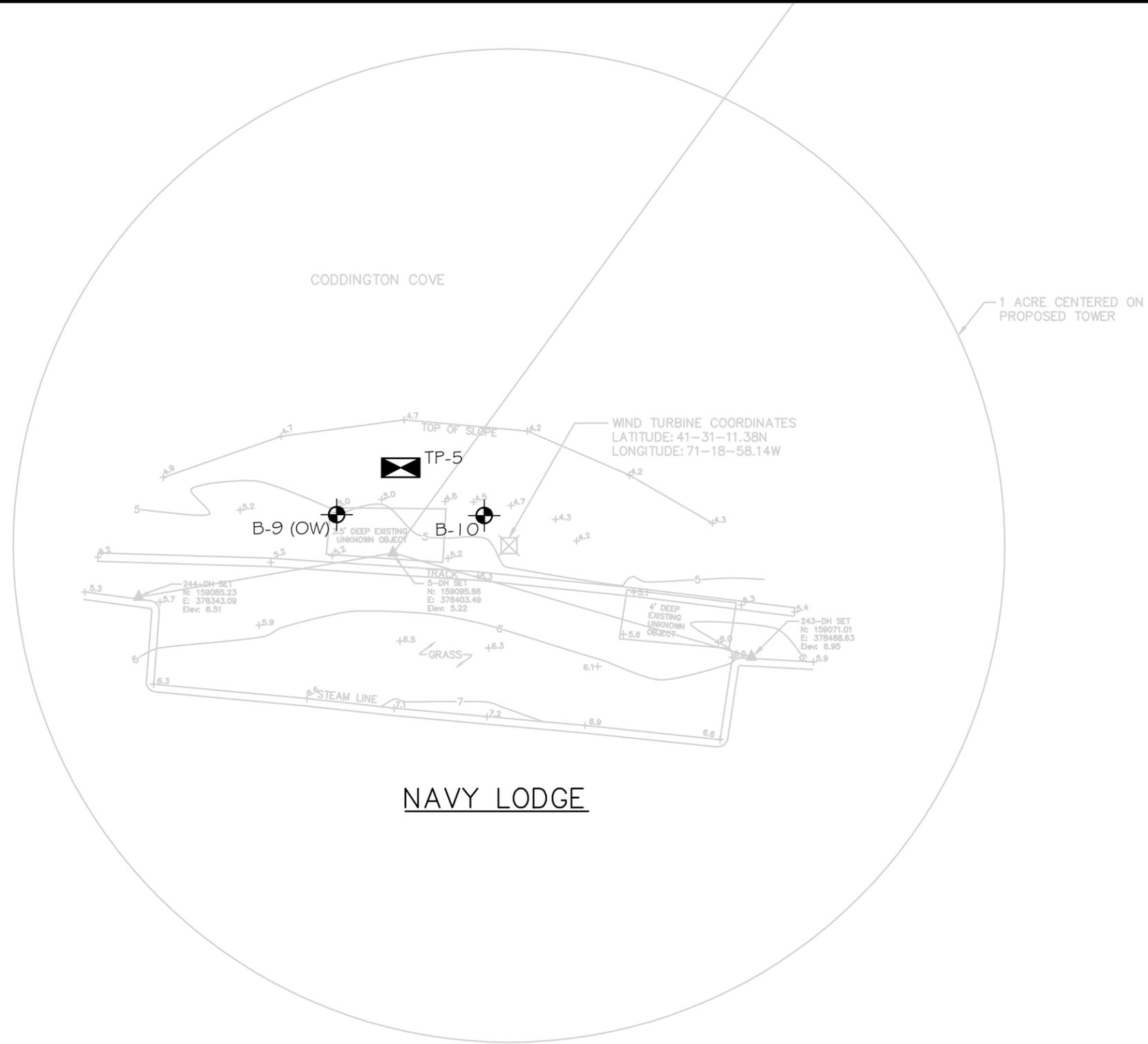
<p>McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)</p>	NAVAL STATION NEWPORT WIND TURBINE SITES	
	NEWPORT RHODE ISLAND	
	SUBSURFACE EXPLORATION PLAN: CODDINGTON POINT	
	FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC	
Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.
Project No: 5441	Scale: SEE PLAN	



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, PRELIMINARY, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



AS SHOWN ON NAVFAC STORM DRAINAGE PLAN 20299-299A

FILE NAME: H:\Acad\JOB5441\5441-FO2A_F02G.dwg

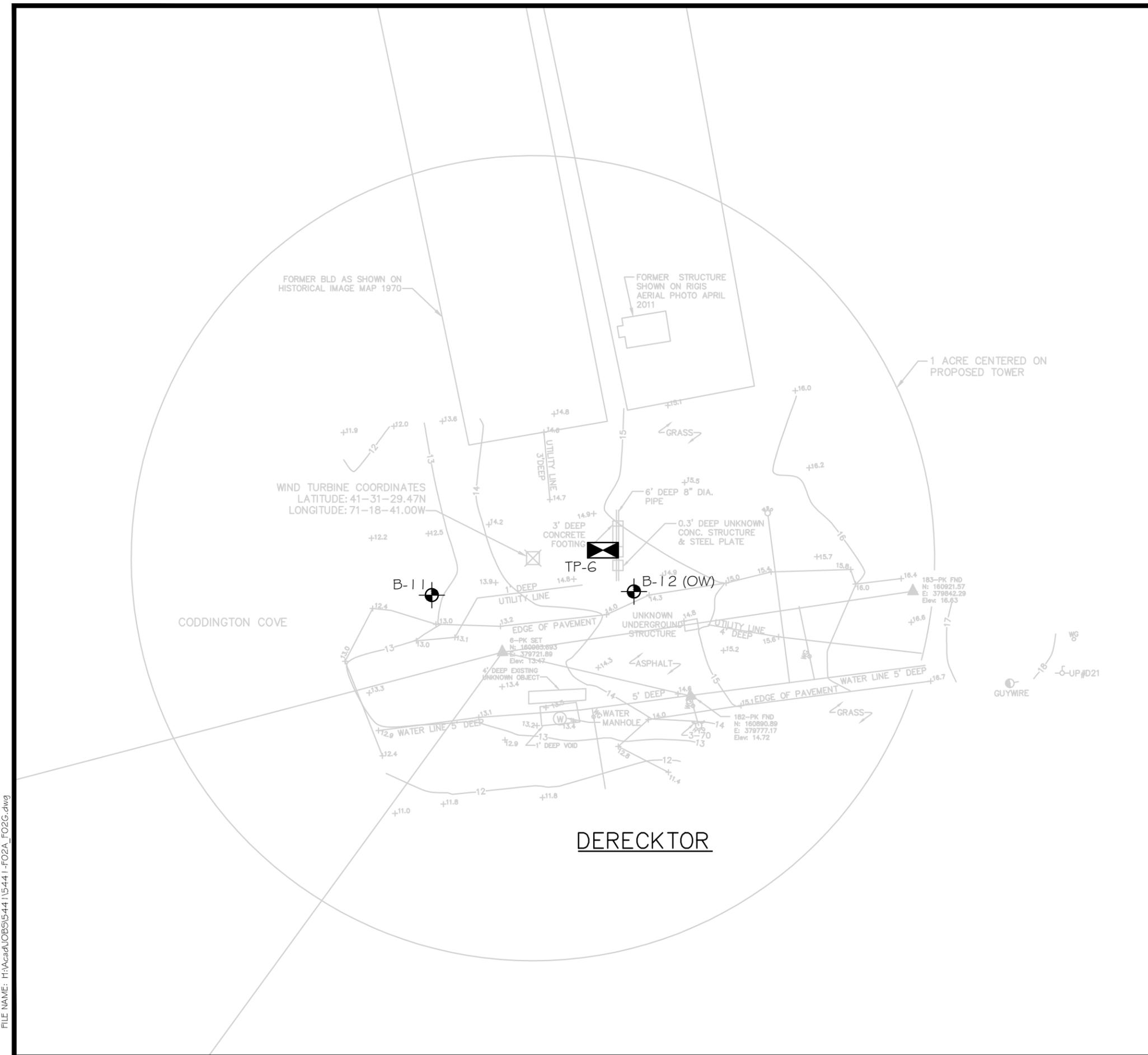
<p>McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)</p>	NAVAL STATION NEWPORT WIND TURBINE SITES NEWPORT RHODE ISLAND		
	SUBSURFACE EXPLORATION PLAN: NAVY LODGE		
	FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC		
	Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.
Project No: 5441			



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, PRELIMINARY, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



FILE NAME: H:\Acad\JOB5441\5441-FO2A_F02G.dwg

 McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)	NAVAL STATION NEWPORT WIND TURBINE SITES	
	NEWPORT RHODE ISLAND	
	SUBSURFACE EXPLORATION PLAN: DERECKTOR	
	FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC	
Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.
Project No: 5441		Scale: SEE PLAN

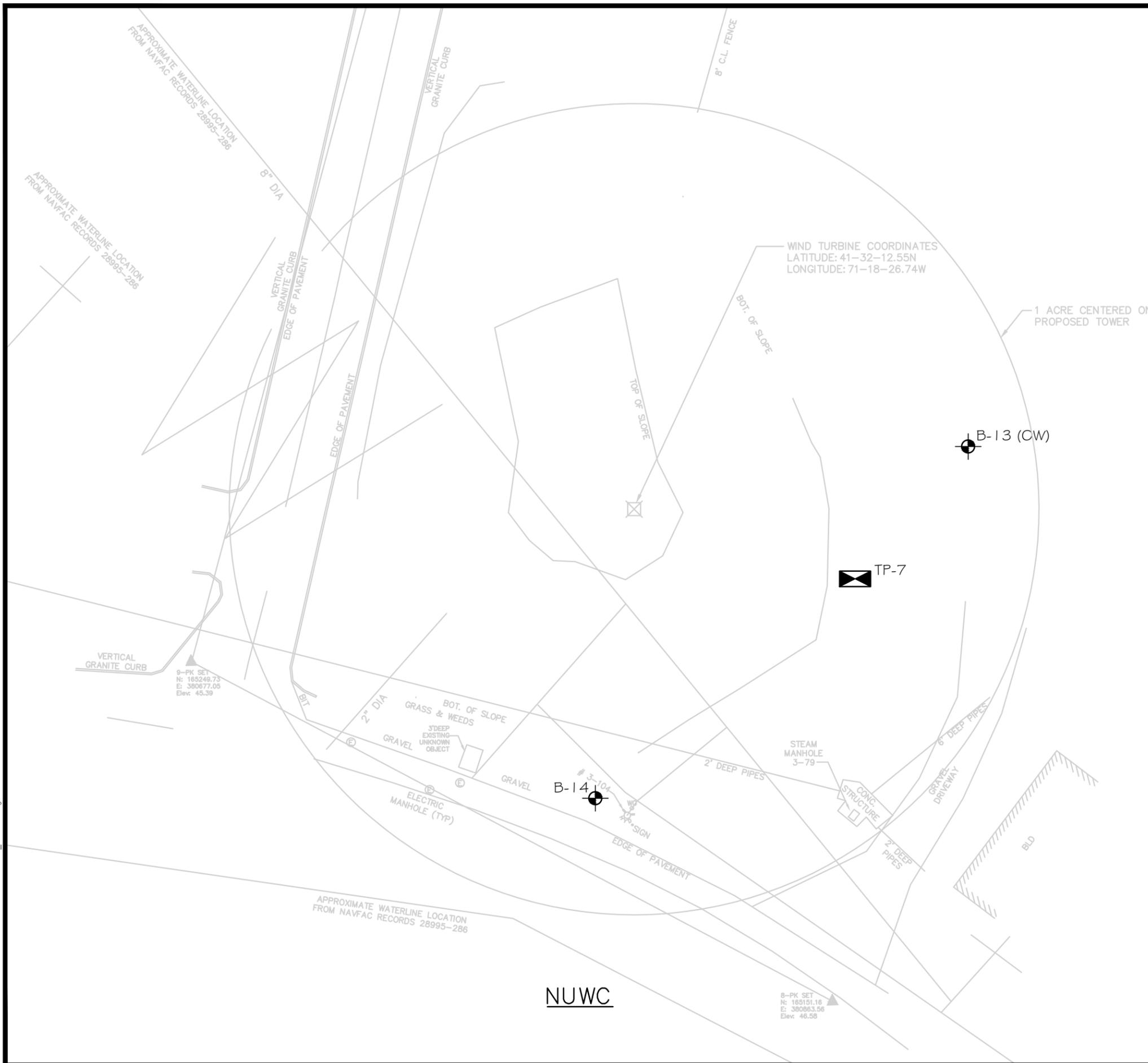
FIGURE 2G



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. ON AUGUST 30 OR SEPTEMBER 6, 2012 FOR McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION, INC. DURING THE PERIOD OF AUGUST 28 THROUGH SEPTEMBER 7, 2012 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A SET OF SEVEN (7) 20-SCALE UNDATED, UNTITLED, EXISTING CONDITIONS DRAWINGS BY GREEN SEAL ENVIRONMENTAL, INC.



FILE NAME: H:\Acad\JOB5441\5441-F02A_F02G.dwg

NUWC

<p>McPHAIL ASSOCIATES, LLC Geotechnical and Geoenvironmental Engineers 2269 Massachusetts Avenue Cambridge, MA 02140 617/868-1420 617/868-1423 (Fax)</p>	NAVAL STATION NEWPORT WIND TURBINE SITES		
	NEWPORT		RHODE ISLAND
	SUBSURFACE EXPLORATION PLAN: NUWC		
FOR CH2M HILL, INC. BY McPHAIL ASSOCIATES, LLC			
Date: NOVEMBER 2012	Dwn: M.B.S.	Chkd: B.A.O.	Scale: SEE PLAN
Project No: 5441			

TABLE 1

ANALYTICAL TEST RESULTS - SOIL

Naval Station Newport Wind Turbine Sites; McPhail Project No. 5441

LOCATION	EPA 1311	TP-1 (BISHOP ROCK)	TP-2 (PF NORTH)	TP-3 (PF SOUTH)	TP-4 (CODDINGTON)	TP-5 (NAVY LODGE)	TP-5 (NAVY LODGE)	TP-6 (DERECKTORS)	TP-7 (NUWC)
SAMPLING DATE		8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	8/30/2012	9/6/2012
LAB SAMPLE ID		L1215635-01	L1215635-02	L1215635-03	L1215635-04	L1215635-05		L1215635-06	L1216084-01
SAMPLE TYPE		FILL	FILL	FILL	FILL	FILL	ORGANIC DEPOSIT	FILL	FILL
SAMPLE DEPTH (ft.)		1'-9.5'	0.5'-6'	0.5'-9'	0.5'-4'	0.5'-5'	5'-15'	0.3'-7'	0.1'-2.5'
Total Solids (%)		90	90	94	92	92		91	95
pH of Soil in Distilled Water		6.1	5.0	5.9	4.6		6.6	6.3	5.6
pH of Soil in Calcium Chloride		5.5	5.0	5.0	4.3		6.2	6.3	5.1
Electrical Resistivity (ohm-cm)		835	5669	3879	33817		209	10941	2785
Sulfate Content (mg/kg)		150	20	60	50		1630	ND	310
Chloride Content (mg/kg)		400	70	30	10		2840	20	80
Total Petroleum Hydrocarbons (TPH) (ug/kg)		44600	63300	ND(35300)	48700	82000		73700	ND(33200)
TCLP Metals (mg/l)									
Arsenic, TCLP	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)		ND(1)	ND(1)
Barium, TCLP	100	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)		ND(0.5)	ND(0.5)
Cadmium, TCLP	1	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)		ND(0.1)	ND(0.1)
Chromium, TCLP	5	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)		ND(0.2)	ND(0.2)
Lead, TCLP	5	9	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)		ND(0.5)	ND(0.5)
Mercury, TCLP	0.2	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)		ND(0.001)	ND(0.001)
Selenium, TCLP	1	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)		ND(0.5)	ND(0.5)
Silver, TCLP	5	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)		ND(0.1)	ND(0.1)
TCLP Semivolatiles (SVOCs) (mg/l)									
Hexachlorobenzene	0.13	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)	ND(0.01)
2,4-Dinitrotoluene	0.13	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
Hexachlorobutadiene	0.5	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)	ND(0.01)
Hexachloroethane	3	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)	ND(0.01)
Nitrobenzene	2	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)	ND(0.01)
2,4,6-Trichlorophenol	2	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
Pentachlorophenol	100	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)		ND(0.05)	ND(0.05)
2-Methylphenol	200	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
3-Methylphenol/4-Methylphenol	200	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
2,4,5-Trichlorophenol	400	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
Pyridine	5	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
TCLP Volatiles (VOCs) (mg/l)									
Chloroform	6	ND(0.0075)	ND(0.0075)	ND(0.0075)	ND(0.0075)	ND(0.0075)		ND(0.0075)	ND(0.0075)
Carbon tetrachloride	0.5	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
Tetrachloroethene	0.7	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
Chlorobenzene	100	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
1,2-Dichloroethane	0.5	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
Benzene	0.5	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
Vinyl chloride	0.2	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)	ND(0.01)
1,1-Dichloroethene	0.7	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
Trichloroethene	0.5	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)	ND(0.005)
1,4-Dichlorobenzene	7.5	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)		ND(0.025)	ND(0.025)
2-Butanone	200	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)		ND(0.05)	ND(0.05)

ND (1.0) - none detected, laboratory detection limit is shown

Bold - concentration exceeds applicable EPA 1311 TCLP threshold concentration for characteristic hazardous waste

McPHAIL ASSOCIATES, LLC

TABLE 2

ANALYTICAL TEST RESULTS - GROUNDWATER

Naval Station Newport Wind Turbine Sites; McPhail Project No. 5441

LOCATION	EPA 1311	B-2 (OW) BISHOP ROCK	B-6 (OW) PF SOUTH	B-12 (OW) DERECKTORS	B-9 (OW) NAVY LODGE	B-3 (OW) PF NORTH
SAMPLING DATE		9/10/2012	9/10/2012	9/10/2012	9/10/2012	9/10/2012
LAB SAMPLE ID		L1216093-01	L1216093-02	L1216093-03	L1216093-04	L1216093-05
SAMPLE TYPE		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Total Petroleum Hydrocarbons (TPH) (mg/l)		ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
TCLP Metals (mg/l)						
Arsenic, TCLP	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Barium, TCLP	100	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Cadmium, TCLP	1	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Chromium, TCLP	5	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Lead, TCLP	5	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Mercury, TCLP	0.2	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Selenium, TCLP	1	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Silver, TCLP	5	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
TCLP Semivolatiles (SVOCs) (mg/l)						
Hexachlorobenzene	0.13	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
2,4-Dinitrotoluene	0.13	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
Hexachlorobutadiene	0.5	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Hexachloroethane	3	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Nitrobenzene	2	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
2,4,6-Trichlorophenol	2	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
Pentachlorophenol	100	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
2-Methylphenol	200	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
3-Methylphenol/4-Methylphenol	200	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
2,4,5-Trichlorophenol	400	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
Pyridine	5	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
TCLP Volatiles (VOCs) (mg/l)						
Chloroform	6	ND(0.00075)	ND(0.00075)	ND(0.00075)	ND(0.00075)	ND(0.00075)
Carbon tetrachloride	0.5	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Tetrachloroethene	0.7	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Chlorobenzene	100	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
1,2-Dichloroethane	0.5	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Benzene	0.5	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Vinyl chloride	0.2	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
1,1-Dichloroethene	0.7	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Trichloroethene	0.5	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
1,4-Dichlorobenzene	7.5	ND(0.0025)	ND(0.0025)	ND(0.0025)	ND(0.0025)	ND(0.0025)
2-Butanone	200	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)

ND (1.0) - none detected, laboratory detection limit is shown

Bold - concentration exceeds applicable EPA 1311 TCLP threshold concentration for characteristic hazardous waste

McPHAIL ASSOCIATES, LLC

TABLE 3

SUMMARY OF SUBSURFACE CONDITIONS

Naval Station Newport Wind Turbine Sites; McPhail Project No. 5441

Proposed Wind Turbine Site	Exploration Designation	Ground Surface Elevation (ft)	Subsurface Stratigraphy and Corresponding Depth (Elevation) Range, feet												
			Topsoil	Fill	Subsoil	Mudline Interface	Organic Deposit	Marine Deposit	Glacial Till Deposit	Cobbles and Boulders	Weathered Bedrock	Bedrock	Groundwater		
Bishop's Rock	B-1	+7.4	---	GS (+7.4) to 8.0 (-0.6)	---	---	8.0 (-0.6) to 11.5 (-4.1)	---	---	---	---	11.5 (-4.1) to 14.0 (-6.6)	14.0 (-6.6) to BOE @ 31.5 (-24.1)	---	
	B-2 (OW)	+7.0	---	GS (+7.0) to 13.0 (-6.0)	---	---	---	---	13.0 (-6.0) to 16.0 (-9.0)	16.0 (-9.0) to 22.5 (-15.5)	---	22.5 (-15.5) to 24.0 (-17.0)	24.0 (-17.0) to BOE @ 34.0 (-27.0)	5.0 (+2.0) to 7.9 (-0.9)	
	TP-1	+7.4	---	GS (+7.4) to 9.5 (-2.1)	---	---	---	---	---	---	9.5 (-2.1) to BOE @ 10.5 (-3.1)	---	---	8.0 (-0.6)	
Prichard Field North	B-3 (OW)	+7.6	GS (+7.6) to 0.5 (+7.1)	0.5 (+7.1) to 9.0 (-1.4)	---	---	---	---	---	---	---	9.0 (-1.4) to 14.0 (-6.4)	14.0 (-6.4) to BOE @ 24.0 (-16.4)	5.8 (+1.8) to 7.2 (+0.4)	
	B-4	+7.2	GS (+7.2) to 0.6 (+6.6)	0.6 (+6.6) to 11.2 (-4.0)	---	---	---	---	---	---	---	11.2 (-4.0) to 20.0 (-12.8)	20.0 (-12.8) to 26.0 (-18.8)	26.0 (-18.8) to BOE @ 36.0 (-28.8)	8.0 (-0.8)
	TP-2	+7.7	GS (+7.7) to 6.0 (+1.7)	---	---	---	---	---	6.0 (+1.7) to BOE @ 15.0 (-7.3)	---	---	---	---	8.0 (-0.3)	
Prichard Field South	B-5	+6.0	GS (+6.0) to 0.3 (+5.7)	0.3 (+5.7) to 8.0 (-2.0)	---	---	8.0 (-2.0) to 10.0 (-4.0)	---	10.0 (-4.0) to 14.0 (-8.0)	14.0 (-8.0) to 15.5 (-9.5)	---	15.5 (-9.5) to 25.0 (-19.0)	25.0 (-19.0) to BOE @ 35.0 (-29.0)	---	
	B-6 (OW)	+5.7	GS (+5.7) to 0.3 (+5.4)	0.3 (+5.4) to 8.0 (-2.3)	---	---	---	8.0 (-2.3) to 12.0 (-6.3)	---	12.0 (-6.3) to 14.0 (-8.3)	---	14.0 (-8.3) to 25.0 (-19.3)	25.0 (-19.3) to BOE @ 35.0 (-29.3)	3.1 (+2.6) to 5.6 (+0.1)	
	TP-3	+5.8	GS (+5.8) to 0.5 (+5.3)	0.5 (+5.3) to 9.0 (-3.2)	---	---	---	9.0 (-3.2) to 10.5 (-4.7)	---	10.5 (-4.7) to 15.0 (-9.2)	---	---	---	9.0 (-3.2)	
Coddington Point	B-7	+20.9	GS (+20.9) to 0.2 (+20.7)	0.2 (+20.7) to 2.0 (+18.9)	---	---	---	---	---	---	---	2.0 (+18.9) to 16.0 (+4.9)	16.0 (+4.9) to BOE @ 26.0 (-5.1)	6.0 (+14.9)	
	B-8 (OW)	+22.5	GS (+22.5) to 0.4 (+22.1)	0.4 (+22.1) to 2.0 (+20.5)	2.0 (+20.5) to 4.0 (+18.5)	---	---	---	---	4.0 (+18.5) to 8.0 (+14.5)	---	8.0 (-14.5) to BOE @ 24.0 (-1.5)	---	13.0 (+9.5) to 18.0 (+4.5)	
	TP-4	+22.6	GS (+22.6) to 0.5 (+22.1)	0.5 (+22.1) to BOE @ 4.0 (+18.6)	---	---	---	---	---	---	---	---	---	---	
Navy Lodge	B-9 (OW)	+5.1	GS (+5.1) to 0.2 (+4.9)	0.2 (+4.9) to 2.0 (+3.1)	---	---	---	2.0 (+3.1) to 10.0 (-4.9)	10.0 (-4.9) to 22.0 (-16.9)	---	---	22.0 (-16.9) to BOE @ 35.0 (-29.9)	---	2.8 (+2.3) to 4.3 (+0.8)	
	B-10	+4.8	GS (+4.8) to 0.2 (+4.6)	0.2 (+4.6) to 11.0 (-6.2)	---	---	---	---	11.0 (-6.2) to 22.0 (-17.2)	---	---	22.0 (-17.2) to BOE @ 40.0 (-35.2)	---	---	
	TP-5	+4.8	GS (+4.8) to 0.5 (+4.3)	0.5 (+4.3) to 5.0 (-0.2)	---	---	---	5.0 (-0.2) to BOE @ 15.0 (-10.2)	---	---	---	---	---	4.0 (+0.8)	
Derecktor	B-11	+13.0	---	GS (+13.0) to 20.0 (-7.0)	---	---	20.0 (-7.0) to 21.0 (-8.0)	---	21.0 (-8.0) to 28.0 (-15.0)	28.0 (-15.0) to BOE @ 41.4 (-28.4)	---	---	---	12.0 (+1.0)	
	B-12 (OW)	+14.7	GS (+14.7) to 0.2 (+14.5)	0.2 (+14.5) to 22.0 (-7.3)	---	---	22.0 (-7.3) to 25.5 (-10.8)	---	25.5 (-10.8) to 27.0 (-12.3)	27.0 (-12.3) to BOE @ 42.0 (-27.3)	---	---	---	14.0 (+0.7) to 15.1 (-0.4)	
	TP-6	+15.2	GS (+15.2) to 0.3 (+14.9)	0.3 (+14.9) to BOE @ 15.0 (+0.2)	---	---	---	---	---	---	---	---	---	---	
NUWC	B-13 (OW)	+43.8	GS (+43.8) to 0.1 (+43.7)	0.1 (+43.7) to 2.0 (+41.8)	---	---	---	---	---	---	---	2.0 (+41.8) to BOE @ 35.2 (+8.6)	---	3.0 (+40.8) to 18.7 (+25.1)	
	B-14	+45.5	GS (+45.5) to 0.2 (+45.3)	0.2 (+45.3) to 2.0 (+43.5)	---	---	---	---	---	---	---	2.0 (+43.5) to 24.0 (+21.5)	24.0 (+21.5) to BOE @ 35.0 (+10.5)	9.0 (+36.5)	
	TP-7	+44.9	GS (+44.9) to 0.1 (+44.8)	0.1 (+44.8) to 2.5 (+42.4)	---	---	---	---	---	---	---	2.5 (+42.4) to BOE @ 10.0 (+34.9)	---	---	

GS: Ground Surface (Depth = 0 feet)

BOE: Bottom of Exploration

(OW): Indicates Observation Well Installed in Completed Borehole

---: Not Encountered in Exploration



APPENDIX A

Limitations



Limitations

This report has been prepared on behalf of and for the exclusive use of CH2M Hill for specific application to the proposed wind turbine structures to be located at Naval Station Newport in Newport, Rhode Island in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

In the event that any changes in nature, design or location of the proposed wind turbine structure are planned, the information contained in this report should not be considered valid unless the changes are reviewed and the information presented in this report is modified or verified in writing.

The analyses and recommendations presented in this report are based upon the data obtained from the subsurface explorations performed at the approximate locations indicated on the enclosed Figures 2A through 2G. If variations in the nature and extent of subsurface conditions between the widely spaced explorations become evident during the course of construction, it will be necessary for a re-evaluation of the recommendations of this report to be made after performing on-site observations during the construction period and noting the characteristics of any variations.



APPENDIX B

McPhail Associates, LLC
Boring Logs B-1 through B-14

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Bishop's Rock	Date Started: 8-28-12	B-1
City/State: Newport, RI	Date Finished: 8-28-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Sheldon / T. Greniera	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	Elev.	Notes
Surface Elevation (ft): 7.4	Sampler Hammer (lbs)/Drop (in): 140/30		

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes			
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft				
1	7	[Symbol: Diagonal Lines]	8.0 / -0.6	FILL	24	S-1	24/17	0.0-2.0	13 13 11 7	COMPACT GREY BROWN TO GREY BLACK SILTY SAND AND GRAVEL [SM]			
2	6				7	S-2	24/16	2.0-4.0	10 4 3 5	LOOSE GREY BLACK SILTY SAND AND GRAVEL WITH RED BRICK FRAGMENTS [GM]			
3	5				6	S-3	24/6	4.0-6.0	6 3 3 3	LOOSE GREY BLACK SILTY SAND WITH SOME GRAVEL AND RED BRICK FRAGMENTS [SM]			
4	4				7	S-4	24/12	6.0-8.0	3 4 3 2	LOOSE GREY BROWN SILTY SAND WITH POCKETS OF GREY ORGANIC SILTY SAND [SM]			
5	3				[Symbol: Downward Arrows]	11.5 / -4.1	MUDLINE	2	S-5	24/8	8.0-10.0	WOR/12" 2 1	VERY LOOSE GREY BLACK GRAVELLY SAND WITH SOME SILT AND A TRACE OF ORGANICS CONTAINING SHELLS [SW-SM]
6	2							7	S-6	18/8	10.0-11.5	1 4 3	LOOSE GREY BROWN SAND WITH A TRACE TO SOME SILT [SP]
7	1							[Symbol: Diagonal Lines]	14.0 / -6.6	WEATHERED BEDROCK	100/3"	S-6A	3/2
8	0				[Symbol: Diagonal Lines]	14.0 / -6.6	BEDROCK				29%	RC-1	42/12
9	-1	[Symbol: Diagonal Lines]	14.0 / -6.6	BEDROCK				30%	RC-2	60/18	17.5-22.5	3 2.75 3 4 7	HARD, SLIGHTLY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, GREY BLACK, AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, OPEN, STEEPLY DIPPING TO VERTICAL ROUGH JOINTS; VERY THIN TO THIN MODERATELY DIPPING BEDDING WITH EVIDENCE OF PREVIOUSLY HEALED JOINTS
10	-2												
11	-3												
12	-4												
13	-5												
14	-6												
15	-7												
16	-8												
17	-9												
18	-10												
19	-11												
20	-12												
21	-13												
22	-14												
23	-15												
24	-16												

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	[] - USCS Symbol
<2	V.SOFT	
2-4	SOFT	
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Bishop's Rock	Date Started: 8-28-12	B-1
City/State: Newport, RI	Date Finished: 8-28-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Sheldon / T. Greniera	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	Elev.	Notes
Surface Elevation (ft): 7.4	Sampler Hammer (lbs)/Drop (in): 140/30		

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"	
					RQD				Min/ft	
25	-17			BEDROCK	33%	RC-3	48/16	22.5-26.5	2.75	HARD, SLIGHTLY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, GREY BLACK, AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, MODERATELY TO STEEPLY DIPPING ROUGH JOINTS; VERY THIN TO THIN MODERATELY DIPPING TO HIGH ANGLE BEDDING
26	-18				3					
27	-19				3.5					
28	-20				4					
29	-21				15%	RC-4	60/9	26.5-31.5	4	SAME AS ABOVE
30	-22							4		
31	-23							4		
32	-24							4		
33	-25		31.5 / -24.1	BOTTOM OF EXPLORATION AT 31.5 FEET						
34	-26									
35	-27									
36	-28									
37	-29									
38	-30									
39	-31									
40	-32									
41	-33									
42	-34									
43	-35									
44	-36									
45	-37									
46	-38									
47	-39									
	-40									

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		
COHESIVE SOILS		Notes: [] - USCS Symbol Weather: _____ Temperature: _____	
BLOWS/FT.	CONSISTENCY		
<2	V.SOFT		
2-4	SOFT		
4-8	FIRM		
8-15	STIFF		
15-30	V.STIFF		
>30	HARD		



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Bishop's Rock **Date Started:** 8-28-12
City/State: Newport, RI **Date Finished:** 8-28-12

Boring No.
B-2 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: M. Ferreira / J. Ferreira **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 7.0 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
8-29-12	6.3	0.7	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
1	6	[Cross-hatched]	4.0 / 3.0	FILL	63	S-1	24/18	0.0-2.0	30 30 33 25	VERY DENSE GREY BROWN TO GREY BLACK SILTY SAND AND GRAVEL [GM]
2	5				22	S-2	24/14	2.0-4.0	11 10 12 7	COMPACT DARK GREY BROWN SILTY SAND AND GRAVEL [GM]
3	4									
4	3									
5	2	[Cross-hatched]	13.0 / -6.0	FILL	8	S-3	24/12	4.0-6.0	7 5 3 4	LOOSE GREY BROWN SILTY, GRAVELLY, SAND [SW-SM]
6	1				4	S-4	24/12	6.0-8.0	2 2 2 2	VERY LOOSE TO LOOSE GREY BROWN SILT AND SAND WITH A TRACE OF GRAVEL [SM]
7	0									
8	-1				13	S-5	24/12	8.0-10.0	7 4 9 10	COMPACT GREY BLACK SILTY SAND AND GRAVEL [GM]
9	-2									
10	-3				25	S-6	24/6	10.0-12.0	10 13 12 12	COMPACT GREY BLACK GRAVELLY SILT AND SAND WITH WOOD [SW-SM]
11	-4									
12	-5				19	S-7	12/6	12.0-13.0	11 13	COMPACT GREY BLACK GRAVELLY SILT AND SAND [SW-SM]
13	-6									
14	-7				[Dotted]	16.0 / -9.0	MARINE DEPOSIT	19	S-7A	12/3
15	-8	26	S-8	24/12				14.0-16.0	9 14 12 14	COMPACT BROWN FINE TO MEDIUM SAND WITH SOME SILT [SP-SM]
16	-9									
17	-10	[Stippled]	22.5 / -15.5	GLACIAL TILL DEPOSIT	39	S-9	24/18	16.0-18.0	17 18 21 18	DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL WITH A TRACE OF CLAY [GM]
18	-11				123	S-10	24/18	18.0-20.0	36 33 90 120	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL WITH A TRACE OF CLAY [GM]
19	-12									
20	-13				73	S-11	24/4	20.0-22.0	54 38 35 33	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL WITH A TRACE OF CLAY [GM]
21	-14									
22	-15	100/0"	S-12	6/2	22.0-22.5	110 100/0"	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL WITH A TRACE OF CLAY [GM]			
23	-16	[Diagonal lines]	24.0 / -17.0	WEATHERED BEDROCK					ROLLER BIT ADVANCED TO 24 FEET TO PRACTICAL REFUSAL. BEGIN ROCK CORING AT 24 FEET	

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 15.3 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Bishop's Rock	Date Started: 8-28-12	B-2 (OW)
City/State: Newport, RI	Date Finished: 8-28-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: M. Ferreira / J. Ferreira	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	8-29-12	6.3
Surface Elevation (ft): 7.0	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"	
					RQD					
25	-18	[Symbol]		BEDROCK	62%	RC-1	60/57	24.0-29.0	3	VERY HARD FRESH TO VERY SLIGHTLY WEATHERED, MODERATELY TO SLIGHTLY FRACTURED, GREY FINE TO MEDIUM GRAINED SANDSTONE; VERY CLOSE TO CLOSE, TIGHT, MODERATELY DIPPING TO VERTICAL JOINTS INFILLED WITH CALCITED QUARTZ SECONDARY MINERALIZATION
26	-19								3	
27	-20								3	
28	-21								3	
29	-22									
30	-23									
31	-24				62%	RC-2	60/59	29.0-34.0	5	SAME AS ABOVE EXCEPT WITH OCCASIONAL ZONES OF GRAYWACKE
32	-25	3								
33	-26	4								
34	-27	4								
35	-28									
36	-29									
37	-30									
38	-31									
39	-32									
40	-33									
41	-34									
42	-35									
43	-36									
44	-37									
45	-38									
46	-39									
47	-40									

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		
COHESIVE SOILS		Notes:	
BLOWS/FT.	CONSISTENCY	[] - USCS Symbol	
<2	V.SOFT	2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 15.3 feet	
2-4	SOFT		
4-8	FIRM		
8-15	STIFF		
15-30	V.STIFF		
>30	HARD		
		Weather:	Temperature:



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Prichard Field North	Date Started: 8-29-12	B-3 (OW)
City/State: Newport, RI	Date Finished: 8-29-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW/NW	Groundwater Observations	
Driller/Helper: M. Ferreira / J. Ferreira	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	8-29-12	7
Surface Elevation (ft): 7.6	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes
		0.6	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"	
					RQD					
25	-17			BOTTOM OF EXPLORATION AT 24 FEET						
26	-18									
27	-19									
28	-20									
29	-21									
30	-22									
31	-23									
32	-24									
33	-25									
34	-26									
35	-27									
36	-28									
37	-29									
38	-30									
39	-31									
40	-32									
41	-33									
42	-34									
43	-35									
44	-36									
45	-37									
46	-38									
47	-39									
	-40									

GRANULAR SOILS		SOIL COMPONENT
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM
0-4	V.LOOSE	
4-10	LOOSE	
10-30	COMPACT	
30-50	DENSE	
>50	V.DENSE	
COHESIVE SOILS		PROPORTION OF TOTAL
BLOWS/FT.	CONSISTENCY	SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"
<2	V.SOFT	0-10%
2-4	SOFT	10-20%
4-8	FIRM	20-35%
8-15	STIFF	35-50%
15-30	V.STIFF	
>30	HARD	
Notes: [] - USCS Symbol 2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 15.6 feet Weather: _____ Temperature: _____		



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Prichard Field North **Date Started:** 8-29-12
City/State: Newport, RI **Date Finished:** 8-30-12

Boring No.

B-4

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW/NW
Driller/Helper: M. Ferreira / J. Ferreira **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 7.2 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
8-29-12	8	-0.8	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes		
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft			
1	7	[Symbol: Diagonal Hatching]	0.6 / 6.6	TOPSOIL	57	S-1	24/15	0.0-2.0	5 20 37 39	VERY DENSE DARK GREY BROWN TO GREY BLACK SILTY SAND AND GRAVEL [GW-GM]		
2	6			FILL	70	S-2	24/20	2.0-4.0	25 33 37 28	VERY DENSE DARK GREY BROWN TO GREY BLACK SILTY SAND AND GRAVEL [GM]		
3	5				36	S-3	24/16	4.0-6.0	20 21 15 10	DENSE GRAVELLY SILTY SAND [SW-SM]		
4	4				36	S-4	24/12	6.0-8.0	16 20 16 12	DENSE GREY BROWN SAND WITH A TRACE OF SILT AND GRAVEL [SW]		
5	3				41	S-5	24/16	8.0-10.0	11 18 23 32	DENSE GREY SAND AND GRAVEL WITH TRACE TO SOME SILT [GM]		
6	2				193/9"	S-6	18/10	10.0-11.5	24 93 100/3"	VERY DENSE ORANGE BROWN AND GREY BROWN SAND AND GRAVEL WITH SOME SILT CONTAINING POCKETS OF BLACK SILT AND FINE SAND [GM]		
7	1				11.2 / -4.0	COBBLES OR BOULDER					ROLLER BIT THROUGH BOULDER FROM 11.2 TO 14.3 FEET. ADVANCED ROLLER BIT WITH MODERATE EFFORT TO 17 FEET.	
8	0											
9	-1				14.3 / -7.1	BOULDER						
10	-2											
11	-3											
12	-4		20.0 / -12.8	WEATHERED BEDROCK	0%	RC-1	60/18	17.0-22.0	5 5 5 2 2	COBBLE(S) OR BOULDER TO 18 FEET. SPLIT SPOON PLACED DOWN HOLE AFTER COMPLETION OF ROCK CORE. SAMPLE FROM 21.6 TO 21.8 FEET. S-7; 21.6'-21.8'; R=2"; N=100/3"; VERY DENSE GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE. ADVANCED ROLLER BIT TO PRACTICAL REFUSAL AT 26 FEET. BEGIN ROCK CORING AT 26 FEET.		
13	-5											
14	-6											
15	-7											
16	-8											
17	-9											
18	-10											
19	-11											
20	-12											
21	-13											
22	-14											
23	-15											
	-16											

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Prichard Field North	Date Started: 8-29-12	B-4
City/State: Newport, RI	Date Finished: 8-30-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW/NW	Groundwater Observations	
Driller/Helper: M. Ferreira / J. Ferreira	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	8-29-12	8
Surface Elevation (ft): 7.2	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
25	-18	[Symbol]	26.0 / -18.8	WEATHERED BEDROCK						
26	-19		BEDROCK (GRAYWACKE)	13%	RC-2	60/48	26.0-31.0	3 2 3 3	TOP 3 FEET: SOFT, MODERATELY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, GREY BLACK AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, HORIZONTAL, SMOOTH JOINTS; VERY THIN HORIZONTAL BEDDING.	
27	-20									
28	-21									
29	-22	29.0 / -21.8	BEDROCK (SANDSTONE)					BOTTOM 2 FEET: HARD, VERY SLIGHTLY TO FRESH WEATHERING, MODERATELY TO SLIGHTLY FRACTURED, FINE TO MEDIUM GRAINED SANDSTONE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, MODERATELY DIPPING ROUGH JOINTS; EVIDENCE OF PREVIOUSLY HEALED JOINTS		
30	-23	[Symbol]	31.0 / -23.8	BEDROCK (GRAYWACKE)	73%	RC-3	60/60	31.0-36.0	2 2 1 2 1	HARD, SLIGHTLY WEATHERED, EXTREMELY FRACTURED TO SOUND, GREY BLACK AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, MODERATELY DIPPING, SMOOTH TO ROUGH JOINTS; VERY THIN TO THIN, MODERATELY DIPPING BEDDING; EVIDENCE OF PREVIOUSLY HEALED JOINTS
31	-24									
32	-25									
33	-26									
34	-27		36.0 / -28.8	BOTTOM OF EXPLORATION AT 36 FEET						
35	-28									
36	-29									
37	-30									
38	-31									
39	-32									
40	-33									
41	-34									
42	-35									
43	-36									
44	-37									
45	-38									
46	-39									
47	-40									

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		
COHESIVE SOILS		Notes: [] - USCS Symbol Weather: _____ Temperature: _____	
BLOWS/FT.	CONSISTENCY		
<2	V.SOFT		
2-4	SOFT		
4-8	FIRM		
8-15	STIFF		
15-30	V.STIFF		
>30	HARD		



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Prichard Field South **Date Started:** 8-30-12
City/State: Newport, RI **Date Finished:** 8-30-12

Boring No.
B-5

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / T. Greniera **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 6.0 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
1	5	[Cross-hatched symbol]	0.3 / 5.7	TOPSOIL	21	S-1	24/14	0.0-2.0	8 10 11 6	COMPACT DARK GREY BROWN SILTY SAND AND GRAVEL [GM]
2	4			FILL	7	S-2	24/13	2.0-4.0	3 2 5 5	LOOSE DARK GREY BROWN WELL-GRADED MIXTURE OF SILT, SAND, AND GRAVEL [SW-SM]
3	3				11	S-3	24/14	4.0-6.0	5 5 6 20	COMPACT DARK GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL CONTAINING WOOD [GM]
4	2				22	S-4	24/16	6.0-8.0	17 13 9 12	COMPACT GREY SAND AND GRAVEL WITH TRACE TO SOME SILT [GW]
5	1				MUDLINE	13	S-5	24/14	8.0-10.0	8 8 5 4
6	0			MARINE DEPOSIT		14	S-6	24/18	10.0-12.0	8 6 8 5
7	-1				7	S-7	24/15	12.0-14.0	2 3 4 3	LOOSE GREY WELL-GRADED MIXTURE OF SILT, SAND, AND GRAVEL [SW-SM]
8	-2				GLACIAL TILL DEPOSIT	59	S-8	18/15	14.0-15.5	18 26 33
9	-3	WEATHERED BEDROCK	59	S-8A		6/3	15.5-16.0	17	COMPACT GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE	
10	-4		10.0 / -4.0	127	S-9	24/16	16.0-18.0	24 32 95 100/1"	VERY DENSE GREY BLACK VERY SEVERELY WEATHERED GRAYWACKE	
11	-5		14.0 / -8.0	100/3"	S-10	3/2	20.0-20.3	100/3"	VERY DENSE BLACK VERY SEVERELY WEATHERED GRAYWACKE	
12	-6			15.5 / -9.5	ADVANCED ROLLER BIT SLOWLY TO 25 FEET. SAMPLED WITH SPLIT SPOON TO REFUSAL; N=100/0"					
13	-7	[Diagonal hatched symbol]	15.5 / -9.5							
14	-8									
15	-9									
16	-10									
17	-11									
18	-12									
19	-13									
20	-14									
21	-15									
22	-16									
23	-17									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Prichard Field South	Date Started: 8-30-12	B-5
City/State: Newport, RI	Date Finished: 8-30-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Sheldon / T. Greniera	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	Elev.	Notes
Surface Elevation (ft): 6.0	Sampler Hammer (lbs)/Drop (in): 140/30		

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
25	-19		25.0 / -19.0	WEATHERED BEDROCK						
26	-20									MEDIUM HARD, SLIGHTLY WEATHERED WITH ZONES OF SEVERELY TO COMPLETELY WEATHERED, EXTREMELY TO MODERATELY FRACTURED; GREY BLACK AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, OPEN, HORIZONTAL DIPPING SMOOTH JOINTS; VERY THIN HORIZONTAL BEDDING
27	-21				0%	RC-1	60/16	25.0-30.0	5 5 5 2 2	
28	-22									
29	-23									
30	-24			BEDROCK						
31	-25									HARD, SLIGHTLY WEATHERED WITH ZONES OF VERY SEVERELY TO COMPLETELY WEATHERED; EXTREMELY TO MODERATELY FRACTURED; GREY BLACK AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, HORIZONTAL, SMOOTH TO ROUGH JOINTS; VERY THIN, HORIZONTAL BEDDING
32	-26				0%	RC-2	60/30	30.0-35.0	5 2 5 5 2	
33	-27									
34	-28									
35	-29		35.0 / -29.0	BOTTOM OF EXPLORATION AT 35 FEET						
36	-30									
37	-31									
38	-32									
39	-33									
40	-34									
41	-35									
42	-36									
43	-37									
44	-38									
45	-39									
46	-40									
47	-41									

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		
COHESIVE SOILS		Notes: [] - USCS Symbol Weather: _____ Temperature: _____	
BLOWS/FT.	CONSISTENCY		
<2	V.SOFT		
2-4	SOFT		
4-8	FIRM		
8-15	STIFF		
15-30	V.STIFF		
>30	HARD		



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Prichard Field South **Date Started:** 8-30-12
City/State: Newport, RI **Date Finished:** 8-31-12

Boring No.
B-6 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / T. Greniera **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 5.7 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
8-31-12	3.1	2.6	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes	
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft		
1	5	[Symbol]	0.3 / 5.4	TOPSOIL	17	S-1	24/10	0.0-2.0	6 8 9 5	COMPACT GREY BROWN SILTY SAND AND GRAVEL [GM]	
2	4	[Symbol]	8.0 / -2.3	FILL	7	S-2	24/13	2.0-4.0	8 5 2 1	LOOSE GREY BROWN FINE TO MEDIUM SAND WITH SOME SILT AND A TRACE OF GRAVEL [SP]	
3	3				13	S-3	24/9	4.0-6.0	1 5 8 15	COMPACT GREY BROWN SAND AND GRAVEL WITH TRACE TO SOME SILT [GW]	
4	2				38	S-4	24/16	6.0-8.0	18 20 18 18	DENSE GREY BROWN TO GREY SILTY SAND AND GRAVEL [GM]	
5	1				2	S-5	24/8	8.0-10.0	1 1 1 4	VERY SOFT TO SOFT GREY SAND AND ORGANIC SILT WITH SOME GRAVEL CONTAINING PEAT FIBERS [OL]	
6	0	[Symbol]	12.0 / -6.3	ORGANIC DEPOSIT	2	S-6	24/4	10.0-12.0	3 1 1 1	VERY SOFT TO SOFT GREY ORGANIC SILT WITH A TRACE OF SAND AND GRAVEL CONTAINING PEAT FIBERS [OL-OH]	
7	-1				12	S-7	24/11	12.0-14.0	5 5 7 10	COMPACT MOTTLED ORANGE BROWN AND GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GW-GM]	
8	-2	[Symbol]	14.0 / -8.3	GLACIAL TILL DEPOSIT	41	S-8	24/20	14.0-16.0	9 15 26 30	DENSE GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE AND SCHIST	
9	-3				107	S-9	24/22	16.0-18.0	26 49 58 47	VERY DENSE ORANGE BROWN AND GREY BROWN VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE AND SCHIST	
10	-4	[Symbol]	14.0 / -8.3	WEATHERED BEDROCK							
11	-5										
12	-6										
13	-7										
14	-8	[Symbol]			107	S-10	24/20	20.0-22.0	55 41 66 67	VERY DENSE GREY BROWN VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE AND SCHIST	
15	-9	[Symbol]									
16	-10	[Symbol]									
17	-11	[Symbol]									
18	-12	[Symbol]									
19	-13	[Symbol]									
20	-14	[Symbol]									
21	-15	[Symbol]									
22	-16	[Symbol]									
23	-17	[Symbol]									
	-18	[Symbol]									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 15.4 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Prichard Field South **Date Started:** 8-30-12
City/State: Newport, RI **Date Finished:** 8-31-12

Boring No.
B-6 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / T. Greniera **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 5.7 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
8-31-12	3.1	2.6	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6" Min/ft	
					RQD					
25	-19		25.0 / -19.3	WEATHERED BEDROCK						
26	-20			BEDROCK	0%	RC-1	60/12	25.0-30.0	3 3 3 3 3	MEDIUM HARD, SLIGHTLY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, GREY BLACK AMORPHOUS GRAYWACKE; VERY CLOSE TO CLOSE, OPEN, HORIZONTAL ROUGH JOINTS; VERY THIN TO THIN HORIZONTAL BEDDING S-11; 25.0'-25.1'; NR; 100/1"; NO RECOVERY
27	-21									
28	-22									
29	-23									
30	-24									
31	-25				33%	RC-2	60/48	30.0-35.0	5 5 5 5 5	HARD, FRESH TO SLIGHTLY WEATHERED, EXTREMELY TO SLIGHTLY FRACTURED, GREY BLACK GRAYWACKE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, HORIZONTAL ROUGH JOINTS; VERY THIN TO THIN, HORIZONTAL BEDDING WITH EVIDENCE OF PREVIOUSLY HEALED JOINTS
32	-26									
33	-27									
34	-28									
35	-29		35.0 / -29.3							
36	-30			BOTTOM OF EXPLORATION AT 35 FEET						
37	-31									
38	-32									
39	-33									
40	-34									
41	-35									
42	-36									
43	-37									
44	-38									
45	-39									
46	-40									
47	-41									
	-42									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 15.4 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Coddington Point	Date Started: 8-31-12	B-7
City/State: Newport, RI	Date Finished: 8-31-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: M. Ferreira / P. Fisher	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	8-31-12	6
Surface Elevation (ft): 20.9	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
1	20		0.2 / 20.7	TOPSOIL					8	DENSE GREY BROWN SILTY, SANDY, GRAVEL [GW-GM]
2	19		2.0 / 18.9	FILL	32	S-1	24/12	0.0-2.0	21	
3	18			WEATHERED BEDROCK	96*19"	S-2	15/12	2.0-3.3	92 46* 50*3"	VERY DENSE LIGHT GREY SLIGHTLY WEATHERED GRAYWACKE
4	17				120*73"	S-3	9/6	4.0-4.8	100* 120*73"	VERY DENSE ORANGE BROWN TO GREY VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE
5	16				120*73"	S-4	9/9	6.0-6.8	100* 120*73"	VERY DENSE GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE
6	15									
7	14									
8	13									
9	12									
10	11									
11	10									
12	9									
13	8									
14	7									
15	6									
16	5		16.0 / 4.9							
17	4			BEDROCK (SCHIST)					3	TOP 2.5 FEET: HARD, VERY SLIGHTLY TO SLIGHTLY WEATHERED, MODERATELY TO SLIGHTLY FRACTURED, GREY BLACK SCHIST; VERY CLOSE TO CLOSE, TIGHT TO OPEN, HORIZONTAL TO MODERATELY DIPPING, SMOOTH TO ROUGH JOINTS; VERY THIN TO THIN MODERATELY DIPPING BEDDING
18	3		18.5 / 2.4		27%	RC-1	60/60	16.0-21.0	3	BOTTOM 2.5 FEET: 4-INCH ZONE OF SOFT VERY SEVERELY WEATHERED GRAYWACKE; REMAINDER OF CORE CONSISTS OF HARD, VERY SLIGHTLY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, FINE TO MEDIUM GRAINED QUARTZ INTRUSION
19	2								2	
20	1								3	
21	0			BEDROCK (INTERBEDDED GRAYWACKE, QUARTZ INTRUSIONS, SANDSTONE, AND AMORPHOUS SCHIST)					2	
22	-1									HARD, SLIGHTLY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, GREY BLACK, FINE TO COARSE GRAINED SANDSTONE, AMORPHOUS SCHIST, AND THIN SEAMS OF GRAYWACKE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, HORIZONTAL TO VERTICAL, SMOOTH TO ROUGH JOINTS;
23	-2				0%	RC-2	60/48	21.0-26.0		VERY THIN TO THIN, HORIZONTAL TO MODERATELY DIPPING BEDDING WITH EVIDENCE OF PREVIOUSLY HEALED JOINTS

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
 [] - USCS Symbol
 * - Sampler Driven with 300 lb Hammer

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Coddington Point	Date Started: 8-31-12	B-7
City/State: Newport, RI	Date Finished: 8-31-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: M. Ferreira / P. Fisher	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	8-31-12	6
Surface Elevation (ft): 20.9	Sampler Hammer (lbs)/Drop (in): 140/30		

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"	
					RQD				Min/ft	
25	-4			BEDROCK (INTERBEDDED GRAYWACKE, QUARTZ INTRUSIONS, SANDSTONE, AND AMORPHOUS SCHIST) BOTTOM OF EXPLORATION AT 26 FEET						4
26	-5		26.0 / -5.1							1
27	-6									2
28	-7									3-4
29	-8									
30	-9									
31	-10									
32	-11									
33	-12									
34	-13									
35	-14									
36	-15									
37	-16									
38	-17									
39	-18									
40	-19									
41	-20									
42	-21									
43	-22									
44	-23									
45	-24									
46	-25									
47	-26									

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	
<2	V.SOFT	[] - USCS Symbol
2-4	SOFT	* - Sampler Driven with 300 lb Hammer
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Coddington Point **Date Started:** 8-31-12
City/State: Newport, RI **Date Finished:** 9-4-12

Boring No.
B-8 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: M. Ferreira / P. Fisher **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 22.5 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
9-4-12	13	9.5	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample				Sample Description and Boring Notes	
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)		Blows/6" Min/ft
1	22	[Symbol]	0.4 / 22.1	TOPSOIL	40	S-1	24/18	0.0-2.0	10 18	DENSE BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GW-GM]
2	21	[Symbol]	2.0 / 20.5	FILL					22 21	
3	20	[Symbol]		SUBSOIL	27	S-2	24/6	2.0-4.0	9 17	COMPACT YELLOW BROWN SANDY GRAVEL WITH SOME SILT [GW-GM]
4	19	[Symbol]	4.0 / 18.5						10 11	
5	18	[Symbol]		GLACIAL TILL DEPOSIT	100/4"	S-3	10/NR	4.0-4.8	68 100/4"	NO RECOVERY
6	17	[Symbol]								
7	16	[Symbol]			54*	S-4	24/16	6.0-8.0	15* 18* 36*	VERY DENSE LIGHT GREY SILTY, SANDY, GRAVEL [GW-GM]
8	15	[Symbol]	8.0 / 14.5						13*	
9	14	[Symbol]		WEATHERED/FRACTURED BEDROCK	157*/11"	S-5	17/12	8.0-9.4	32* 57* 100*/5"	VERY DENSE, VERY SEVERELY TO COMPLETELY WEATHERED SCHIST
10	13	[Symbol]								
11	12	[Symbol]			59*	S-6	24/18	10.0-12.0	20* 32* 27* 55*	VERY DENSE, GREY BLACK, VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE AND SCHIST
12	11	[Symbol]								ADVANCE ROLLER BIT TO PRACTICAL REFUSAL AT 14 FEET. BEGIN ROCK CORING AT 14 FEET
13	10	[Symbol]								
14	9	[Symbol]								
15	8	[Symbol]								NO RECOVERY
16	7	[Symbol]								
17	6	[Symbol]			0%	RC-1	60/0	14.0-19.0		
18	5	[Symbol]								
19	4	[Symbol]								
20	3	[Symbol]								NO RECOVERY
21	2	[Symbol]								
22	1	[Symbol]			0%	RC-2	60/0	19.0-24.0		
23	0	[Symbol]								
	-1	[Symbol]	24.0 / -1.5							

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
* - Sampler Driven with 300 lb Hammer
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 19 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Navy Lodge **Date Started:** 8-31-12
City/State: Newport, RI **Date Finished:** 8-31-12

Boring No.
B-9 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / T. Greniera **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 5.1 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
8-31-12	3	2.1	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
1	4		0.2 / 4.9	TOPSOIL					2	LOOSE GREY BROWN SILTY SAND AND GRAVEL [GM]
				FILL	8	S-1	24/8	0.0-2.0	3	
2	3		2.0 / 3.1						5	VERY LOOSE BROWN PEATY SAND [PT]
3	2				3	S-2	24/6	2.0-4.0	1	
4	1			ORGANIC DEPOSIT					2	VERY SOFT TO SOFT DARK BROWN SAND AND FIBROUS PEAT [SW]
5	0				2	S-3	24/8	4.0-6.0	1	
6	-1								1	VERY LOOSE BROWN SAND WITH SOME GRAVEL AND A TRACE TO SOME SILT [SW]
7	-2				2	S-4	24/6	6.0-8.0	1	
8	-3								1	
9	-4				2	S-5	24/3	8.0-10.0	1	VERY LOOSE GREY ORGANIC SILTY SAND WITH SOME GRAVEL [PT]
10	-5		10.0 / -4.9	MARINE DEPOSIT					1	LOOSE DARK GREY BROWN SILT AND FINE SAND WITH A TRACE OF GRAVEL [SM]
11	-6				5	S-6	24/9	10.0-12.0	2	
12	-7								3	LOOSE DARK GREY BROWN SILT AND FINE SAND WITH A TRACE OF CLAY AND GRAVEL [SM]
13	-8				8	S-7	24/7	12.0-14.0	5	
14	-9								3	
15	-10				32	S-8	24/12	14.0-16.0	16	DENSE DARK GREY BROWN SILTY SAND AND GRAVEL [GM]
16	-11							17	COMPACT STRATIFIED BROWN SILTY, GRAVELLY, FINE TO MEDIUM SAND [SW-SM]	
17	-12							15		
18	-13		18.0 / -12.9		24	S-9	24/15	16.0-18.0		13
19	-14			MARINE DEPOSIT					7	COMPACT STRATIFIED LIGHT GREY BROWN SILT, FINE SANDY SILT, AND SILTY FINE SAND WITH A TRACE OF GRAVEL [SM]
20	-15				16	S-10	24/13	18.0-20.0	7	
21	-16								9	COMPACT STRATIFIED LIGHT GREY GREEN SILT, FINE SANDY SILT, AND SILTY FINE SAND WITH A TRACE OF GRAVEL [SM]
22	-17		22.0 / -16.9		12	S-11	24/16	20.0-22.0	7	
23	-18			WEATHERED/FRACTURED SCHIST BEDROCK	57	S-12	24/16	22.0-24.0	20	VERY DENSE LIGHT GREY GREEN VERY SEVERELY TO COMPLETELY WEATHERED SCHIST

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 14.3 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Navy Lodge	Date Started: 8-31-12	B-9 (OW)
City/State: Newport, RI	Date Finished: 8-31-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Sheldon / T. Greniera	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	8-31-12	3
Surface Elevation (ft): 5.1	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes		
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"			
					RQD				Min/ft			
25	-20	[Symbol]		WEATHERED/FRACTURED SCHIST BEDROCK	151/9"	S-13	15/12	24.0-25.3	28 51 100/3"	VERY DENSE LIGHT GREY GREEN VERY SEVERELY TO COMPLETELY WEATHERED SCHIST		
26	-21											
27	-22											
28	-23											
29	-24											
30	-25											
31	-26										MEDIUM HARD TO SOFT, MODERATELY WEATHERED, LIGHT GREY GREEN AMORPHOUS SCHIST; VERY THIN TO THIN, HORIZONTAL TO MODERATELY DIPPING, SMOOTH TO ROUGH JOINTS; VERY THIN TO THIN, HORIZONTAL TO MODERATELY DIPPING BEDDING WITH EVIDENCE OF HEALED JOINTS	
32	-27										2 2 2 2 2	
33	-28							0%	RC-1	60/18	30.0-35.0	
34	-29											
35	-30		35.0 / -29.9	BOTTOM OF EXPLORATION AT 35 FEET								
36	-31											
37	-32											
38	-33											
39	-34											
40	-35											
41	-36											
42	-37											
43	-38											
44	-39											
45	-40											
46	-41											
47	-42											

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	
<2	V.SOFT	[] - USCS Symbol
2-4	SOFT	2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 14.3 feet
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Navy Lodge **Date Started:** 9-4-12
City/State: Newport, RI **Date Finished:** 9-4-12

Boring No.
B-10

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / P. Fisher **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 4.8 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
1	4		0.2 / 4.6	TOPSOIL	9	S-1	24/12	0.0-2.0	2 4 5 6	LOOSE SANDY GRAVEL CONTAINING RED BRICK FRAGMENTS [GP]
2	3		FILL	13	S-2	24/14	2.0-4.0	6 9 4 3	COMPACT DARK GREY BROWN SANDY GRAVEL WITH SOME SILT CONTAINING YELLOW BRICK FRAGMENTS [GW]	
3	2			2	S-3	24/NR	4.0-6.0	5 1 1 2	NO RECOVERY	
4	1			2	S-4	24/NR	6.0-8.0	1 1 1 1	NO RECOVERY	
5	0			2	S-5	24/1	8.0-10.0	1 1 1 1	VERY LOOSE DARK GREY BROWN SAND AND GRAVEL WITH SHELLS (WASH) DRILLER INDICATES SAND AND GRAVEL IN WASH RETURN FROM 4 TO 10 FEET	
6	-1			MARINE DEPOSIT	20	S-6	24/16	10.0-12.0	7 9 11 12	COMPACT DARK GREY SILT AND SAND WITH A TRACE OF GRAVEL WITH POCKETS OF ORGANICS [SM] TRANSITIONING TO A DENSE MOTTLED GREY BROWN WELL GRADED MIXTURE OF SILT SAND AND GRAVEL [GM]
7	-2				42	S-7	24/11	12.0-14.0	11 14 28 34	DENSE MOTTLED GREY BROWN SANDY, SILTY, GRAVEL [GW-GM]
8	-3				45	S-8	24/16	14.0-16.0	36 25 20 20	DENSE MOTTLED LIGHT GREY SILT AND SAND WITH SOME GRAVEL AND A TRACE OF CLAY [GM]
9	-4				26	S-9	24/12	16.0-18.0	17 15 11 12	COMPACT LIGHT GREY GREEN SILT AND SAND WITH SOME GRAVEL AND A TRACE OF CLAY [GM]
10	-5				15	S-10	24/14	18.0-20.0	8 6 9 2	COMPACT MOTTLED LIGHT GREY GREEN SILT AND SAND WITH SOME GRAVEL AND A TRACE OF CLAY [GM]
11	-6				18	S-11	24/15	20.0-22.0	6 8 10 8	COMPACT MOTTLED LIGHT GREY GREEN SILT AND SAND WITH A TRACE OF CLAY AND GRAVEL [SM]
12	-7		WEATHERED/FRACTURED BEDROCK		48	S-12	24/14	22.0-24.0	15 13 35 32	DENSE LIGHT GREY GREEN VERY SEVERELY TO COMPLETELY WEATHERED SCHIST
13	-8									
14	-9									
15	-10									
16	-11									
17	-12									
18	-13									
19	-14									
20	-15									
21	-16									
22	-17		22.0 / -17.2							
23	-18									
	-19									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Navy Lodge **Date Started:** 9-4-12
City/State: Newport, RI **Date Finished:** 9-4-12

Boring No.
B-10

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / P. Fisher **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 4.8 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes	
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"		
					RQD				Min/ft		
25	-20	[Symbol]	40.0 / -35.2	WEATHERED/FRACTURED BEDROCK	58	S-13	24/17	24.0-26.0	24	VERY DENSE LIGHT GREY GREEN VERY SEVERELY TO COMPLETELY WEATHERED SCHIST	
26	-21				23				ADVANCED ROLLER BIT WITH MODERATE EFFORT TO 30 FEET. BEGIN ROCK CORING AT 30 FEET.		
27	-22				35						
28	-23				60						
29	-24										
30	-25										
31	-26										NO RECOVERY
32	-27				2						
33	-28				2						
34	-29				2						
35	-30	2									
36	-31	[Symbol]	40.0 / -35.2	BOTTOM OF EXPLORATION AT 40 FEET	0%	RC-1	60/0	30.0-35.0	2	MEDIUM HARD, SLIGHTLY WEATHERED, EXTREMELY TO MODERATELY FRACTURED, LIGHT GREY GREEN, FINE TO MEDIUM GRAINED SANDSTONE; VERY CLOSE TO CLOSE, TIGHT TO OPEN, HORIZONTAL SMOOTH TO ROUGH JOINTS	
37	-32				2						
38	-33				2						
39	-34				2						
40	-35				2						
41	-36										
42	-37										
43	-38										
44	-39										
45	-40										
46	-41										
47	-42										
	-43										

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Derecktor **Date Started:** 9-4-12
City/State: Newport, RI **Date Finished:** 9-5-12

Boring No.
B-11

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: M. Ferreira / J. Ferreira **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 13.0 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
9-5-12	12	1.0	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes				
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft					
1	12	[Cross-hatched symbol]	9.0 / 4.0	FILL	157	S-1	24/14	0.0-2.0	60 72 85 91	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]				
2	11				73	S-2	24/18	2.0-4.0	31 41 32 39	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GW-GM]				
3	10				22	S-3	24/10	4.0-6.0	23 12 10	COMPACT GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]				
4	9				22	S-4	24/10	6.0-8.0	8 10 12 8	COMPACT GREY BROWN SILT AND SAND WITH SOME GRAVEL AND A TRACE OF CLAY [SM]				
5	8								7 8	COMPACT GREY BROWN SILT AND SAND WITH SOME GRAVEL AND A TRACE OF CLAY [SM]				
6	7				[Diagonal hatched symbol]	20.0 / -7.0	BLASTED BEDROCK FILL	29	S-5	12/10	8.0-9.0	7 8	COMPACT GREY BROWN SILT AND SAND WITH SOME GRAVEL AND A TRACE OF CLAY [SM]	
7	6							29	S-5A	12/5	9.0-10.0	21 23	DENSE GREY BLACK SILTY SAND AND GRAVEL [GM]	
8	5							32	S-6	24/12	10.0-12.0	17 15 17 18	COMPACT TO DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]	
9	4							44	S-7	24/10	12.0-14.0	40 27 17 14	DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]	
10	3							6	S-8	24/6	14.0-16.0	4 4 2 11	LOOSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]	
11	2	7 5 7 45	COMPACT GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]											
12	1	28	S-10	24/9				18.0-20.0	16 14 14 11	COMPACT GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]				
13	0								31	S-11	12/12	20.0-21.0	12 15	COMPACT GREY BLACK SILT SAND FINE SAND WITH SOME ORGANICS [OL-SM]
14	-1	[Dotted symbol]	21.0 / -8.0	MUDLINE				31	S-11A	12/10	21.0-22.0	16 36	DENSE GREY BLACK SAND WITH A TRACE OF SILT AND GRAVEL [SW]	
15	-2											39	S-12	24/20
16	-3													
17	-4													
18	-5													
19	-6													
20	-7													
21	-8													
22	-9													
23	-10													

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
* - Sampler Driven with 300 lb Hammer

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: Derecktor	Date Started: 9-4-12	B-11
City/State: Newport, RI	Date Finished: 9-5-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: M. Ferreira / J. Ferreira	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	9-5-12	12
Surface Elevation (ft): 13.0	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes
		1.0	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes			
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft				
25	-12	[Symbol]	28.0 / -15.0	MARINE DEPOSIT	40	S-13	24/22	24.0-26.0	9 15 25 29	DENSE GREY BLACK FINE TO MEDIUM SAND WITH A TRACE OF SILT [SP]			
26	-13				57	S-14	24/22	26.0-28.0	19 27 30 34	VERY DENSE GREY BLACK FINE TO MEDIUM SAND WITH A TRACE OF SILT [SP]			
27	-14	[Symbol]	41.4 / -28.4	GLACIAL TILL DEPOSIT	64	S-15	24/10	28.0-30.0	34 38 26 21	VERY DENSE GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]			
28	-15												
29	-16												
30	-17												
31	-18												
32	-19												
33	-20							185	S-16	24/18	32.0-34.0	27 85 100 100	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]
34	-21												
35	-22												
36	-23							170*	S-17	21/18	35.0-36.8	65* 80* 90* 100*/3"	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]
37	-24												
38	-25												
39	-26												
40	-27												
41	-28				220*/11"	S-18	17/16	40.0-41.4	80* 100* 120*/5"	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]			
42	-29			BOTTOM OF EXPLORATION AT 41.4 FEET									
43	-30												
44	-31												
45	-32												
46	-33												
47	-34												

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	
<2	V.SOFT	[] - USCS Symbol
2-4	SOFT	* - Sampler Driven with 300 lb Hammer
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Derecktor **Date Started:** 9-4-12
City/State: Newport, RI **Date Finished:** 9-5-12

Boring No.
B-12 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / P. Fisher **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 14.7 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
9-5-12	14	0.7	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
1	14		0.2 / 14.5	TOPSOIL	55	S-1	24/20	0.0-2.0	46 26 29 25	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]
2	13		29	S-2	24/20	2.0-4.0	24 12 17 12	COMPACT GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
3	12		22	S-3	24/9	4.0-6.0	15 8 14 9	COMPACT GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
4	11		15	S-4	24/12	6.0-8.0	7 4 11 5	COMPACT GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
5	10		10	S-5	24/8	8.0-10.0	8 5 5 3	LOOSE TO COMPACT GREY BROWN SILT AND SAND WITH SOME GRAVEL [SM]		
6	9		3	S-6	24/10	10.0-12.0	1 2 1 1	VERY LOOSE GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [SW-SM]		
7	8		2	S-7	24/6	12.0-14.0	2 1 1 1	VERY LOOSE GREY BROWN SILT AND SAND WITH SOME GRAVEL [SM]		
8	7		10	S-8	24/6	14.0-16.0	2 2 8 15	LOOSE TO COMPACT GREY BROWN GRAVELLY SILT AND SAND [GM]		
9	6		26	S-9	24/18	16.0-18.0	32 17 9 6	COMPACT GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
10	5		20	S-10	24/16	18.0-20.0	6 11 9 7	COMPACT GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
11	4		6	S-11	24/14	20.0-22.0	4 2 4 4	LOOSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
12	3		9	S-12	24/14	22.0-24.0	3 4 4 4	LOOSE GREY BLACK FINE TO MEDIUM SAND WITH SOME SILT AND A TRACE OF GRAVEL AND ORGANICS [SP]		
13	2									
14	1									
15	0									
16	-1									
17	-2									
18	-3									
19	-4									
20	-5									
21	-6									
22	-7									
23	-8									
	-9									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 27.5 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: Derecktor **Date Started:** 9-4-12
City/State: Newport, RI **Date Finished:** 9-5-12

Boring No.
B-12 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / P. Fisher **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 14.7 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
9-5-12	14	0.7	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes		
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft			
25	-10	[Symbol]	25.5 / -10.8	MUDLINE	11	S-13	24/16	24.0-26.0	6 4 7 16	COMPACT GREY BLACK FINE TO MEDIUM SAND WITH A TRACE TO SOME SILT AND A TRACE OF ORGANICS [SP]		
26	-11			MARINE DEPOSIT	68	S-14	12/12	26.0-27.0	18 19	DENSE GREY BLACK SAND WITH A TRACE OF SILT AND GRAVEL [SW]		
27	-12	[Symbol]	27.0 / -12.3	GLACIAL TILL DEPOSIT	68	S-14A	12/2	27.0-28.0	49 51	VERY DENSE GREY BLACK SAND AND GRAVEL WITH A TRACE OF SILT [GW]		
28	-13				80	S-15	24/19	28.0-30.0	20 45 35 43	VERY DENSE GREY BLACK WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
29	-14											
30	-15											
31	-16											
32	-17											
33	-18				59	S-16	24/18	32.0-34.0	24 22 37 35	VERY DENSE GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
34	-19											
35	-20											
36	-21				97	S-17	17/16	35.0-36.4	45 52 100/5"	VERY DENSE GREY BROWN WELL GRADED MIXTURE OF SILT, SAND, AND GRAVEL [GM]		
37	-22											
38	-23											
39	-24											
40	-25											
41	-26											
42	-27		42.0 / -27.3									
43	-28			BOTTOM OF EXPLORATION AT 42 FEET								
44	-29											
45	-30											
46	-31											
47	-32											
	-33											

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
[] - USCS Symbol
2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 27.5 feet

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project: Naval Station Newport Wind Turbine Sites **Job #:** 5441.2.00
Location: NUWC **Date Started:** 9-6-12
City/State: Newport, RI **Date Finished:** 9-6-12

Boring No.
B-13 (OW)

Contractor: Geologic Earth Exploration, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Sheldon / T. Greniera **Casing Hammer (lbs)/Drop (in):** 300/24
Logged By/Reviewed By: T. Cormican / B. O'Neil **Sampler Size/Type:** 1-3/8" ID Split Spoon
Surface Elevation (ft): 43.8 **Sampler Hammer (lbs)/Drop (in):** 140/30

Groundwater Observations			
Date	Depth	Elev.	Notes
9-5-12	3	40.8	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes			
					N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft				
25	19	[Symbol]		WEATHERED/FRACTURED BEDROCK	100/3"	S-9	3/3	25.0-25.3	100/3"	VERY DENSE GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE			
26	18												
27	17												
28	16												
29	15												
30	14												
31	13							100/2"	S-10	2/2	30.0-30.2	100/2"	VERY DENSE GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE
32	12												
33	11												
34	10												
35	9		35.2 / 8.6										
36	8			BOTTOM OF EXPLORATION AT 35.3 FEET	100/3"	S-11	3/3	35.0-35.3	100/3"	VERY DENSE GREY BLACK VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE			
37	7												
38	6												
39	5												
40	4												
41	3												
42	2												
43	1												
44	0												
45	-1												
46	-2												
47	-3												
	-4												

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	
<2	V.SOFT	[] - USCS Symbol
2-4	SOFT	2-inch diameter observation well installed in completed borehole; slotted pipe from ground surface to bottom of well at 20.1 feet
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather: Temperature:



McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Page 2 of 2

Project: Naval Station Newport Wind Turbine Sites	Job #: 5441.2.00	Boring No.
Location: NUWC	Date Started: 9-6-12	B-14
City/State: Newport, RI	Date Finished: 9-7-12	

Contractor: Geologic Earth Exploration, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Sheldon / T. Greniera	Casing Hammer (lbs)/Drop (in): 300/24	Date	Depth
Logged By/Reviewed By: T. Cormican / B. O'Neil	Sampler Size/Type: 1-3/8" ID Split Spoon	9-7-12	9
Surface Elevation (ft): 45.5	Sampler Hammer (lbs)/Drop (in): 140/30	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample					Sample Description and Boring Notes
					N-Value	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6"	
					RQD					
25	21		27.0 / 18.5	BEDROCK (CONGLOMERATE)						TOP 2 FEET: MEDIUM HARD, SLIGHTLY WEATHERED, SLIGHTLY FRACTURED TO SOUND, GREY BLACK, FINE TO VERY COARSE GRAINED CONGLOMERATE CLOSE TO MODERATELY CLOSE, MODERATELY DIPPING ROUGH JOINTS BOTTOM 3 FEET: MEDIUM HARD, SLIGHTLY TO MODERATELY WEATHERED, SLIGHTLY FRACTURED TO SOUND, GREY BLACK AMORPHOUS GRAYWACKE; CLOSE TO MODERATELY CLOSE, TIGHT, MODERATELY DIPPING ROUGH JOINTS; VERY THIN TO THIN HORIZONTAL BEDDING
26	20								2	
27	19									
28	18		30.0 / 15.5	BEDROCK (GRAYWACKE)	87%	RC-1	60/56	25.0-30.0		
29	17								2	
30	16									2
31	15		32.0 / 13.5	BEDROCK (SANDSTONE)						TOP 2 FEET: MEDIUM HARD, SLIGHTLY WEATHERED, SOUND, GREY, FINE TO MEDIUM GRAINED SANDSTONE; CLOSE TO MODERATELY CLOSE, TIGHT, HORIZONTAL ROUGH JOINTS BOTTOM 3 FEET: MEDIUM HARD, SLIGHTLY TO MODERATELY WEATHERED, SLIGHTLY FRACTURED TO SOUND, GREY BLACK AMORPHOUS GRAYWACKE; VERY CLOSE TO MODERATELY CLOSE, TIGHT TO OPEN, STEEPLY DIPPING TO VERTICAL ROUGH JOINTS; VERY THIN TO THIN HORIZONTAL BEDDING
32	14								2	
33	13									
34	12		35.0 / 10.5	BEDROCK (GRAYWACKE)	83%	RC-2	60/54	30.0-35.0		
35	11									2
36	10									2
37	9			BOTTOM OF EXPLORATION AT 35 FEET						
38	8									
39	7									
40	6									
41	5									
42	4									
43	3									
44	2									
45	1									
46	0									
47	-1									
	-2									

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	[] - USCS Symbol
<2	V.SOFT	
2-4	SOFT	
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather: _____ Temperature: _____



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

Page 2 of 2



APPENDIX C

McPhail Associates, LLC
Test Pit Logs TP-1 through TP-7

JOB NO. 5441

TEST PIT LOG

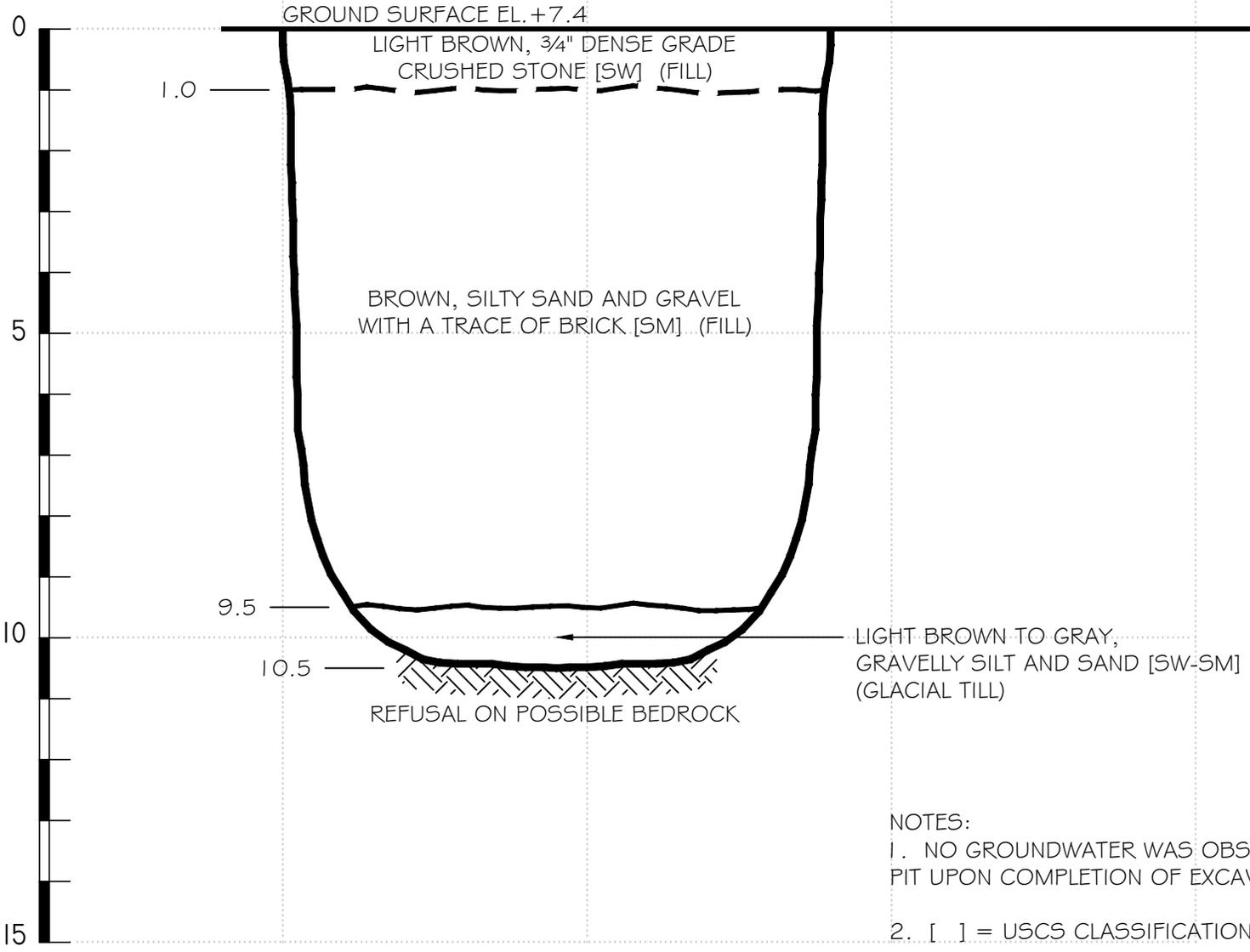
TEST PIT NO. 1

DATE AUGUST 30, 2012

0 5 10 15 FT.

NORTH ←

→ SOUTH



McPHAIL ASSOCIATES, LLC

NOTES:

1. NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION

2. [] = USCS CLASSIFICATION SYMBOL

JOB NO. 5441

TEST PIT LOG

TEST PIT NO. 2

DATE AUGUST 30, 2012

0 5 10 15 FT.

NORTH ←

→ SOUTH

GROUND SURFACE EL. +7.7

(TOPSOIL)

0.5

DARK BROWN TO BROWN, SILTY FINE TO MEDIUM SAND WITH SOME GRAVEL AND A TRACE OF COBBLES, BRICK, AND CONCRETE [SM] (FILL)

5

6.0

LOOSE, LIGHT BROWN, FINE TO COARSE SAND WITH A TRACE OF SILT, GRAVEL, AND SEA SHELLS [SP] (MARINE DEPOSIT)

10

15

15.0

BOTTOM OF TEST PIT

McPHAIL ASSOCIATES, LLC

NOTES:

1. GROUNDWATER WAS OBSERVED IN OPEN TEST PIT AT A DEPTH OF 8 FEET UPON COMPLETION OF EXCAVATION

2. [] = USCS CLASSIFICATION SYMBOL

JOB NO. 5441

DATE AUGUST 30, 2012

TEST PIT LOG

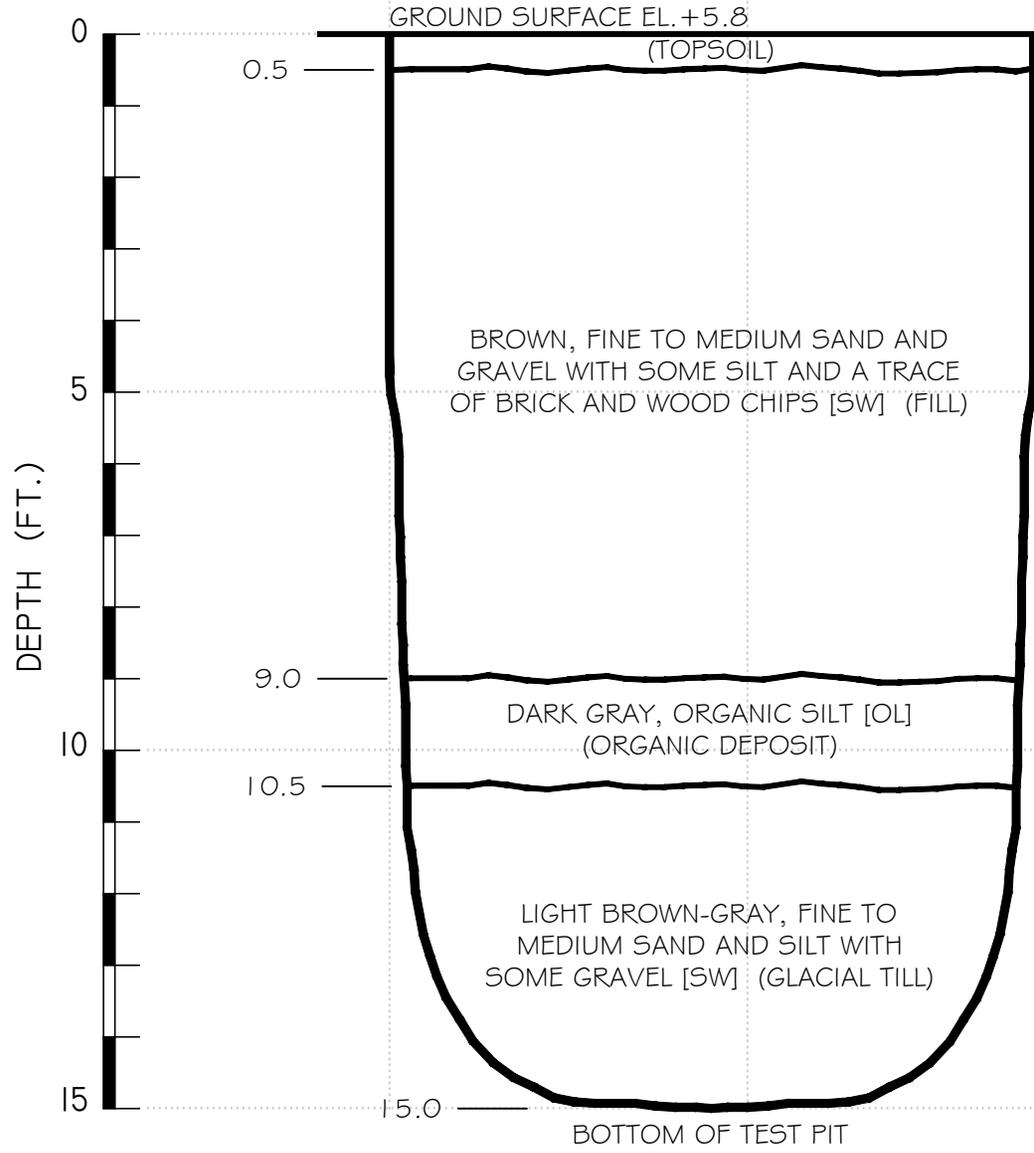
TEST PIT NO. 3

NORTH ←

0 5 10 15 FT.

→ SOUTH

McPHAIL ASSOCIATES, LLC



NOTES:

1. GROUNDWATER WAS OBSERVED IN OPEN TEST PIT AT A DEPTH OF 9 FEET UPON COMPLETION OF EXCAVATION

2. [] = USCS CLASSIFICATION SYMBOL

JOB NO. 5441

DATE AUGUST 30, 2012

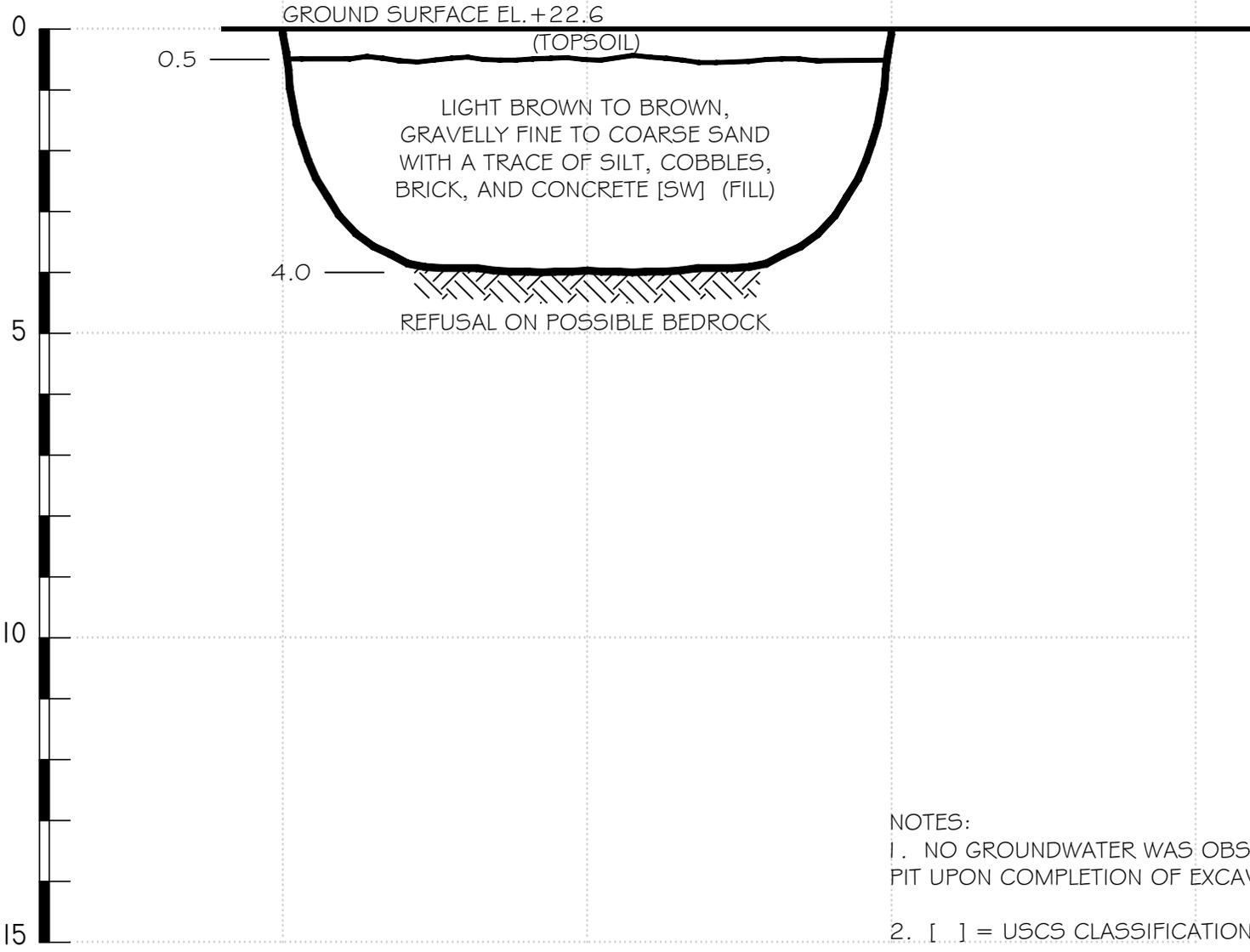
TEST PIT LOG

TEST PIT NO. 4

0 5 10 15 FT.

NORTH ←

→ SOUTH



MCPHAIL ASSOCIATES, LLC

- NOTES:
- 1. NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION
 - 2. [] = USCS CLASSIFICATION SYMBOL

JOB NO. 5441

TEST PIT LOG

TEST PIT NO. 5

DATE AUGUST 30, 2012

0 5 10 15 FT.



GROUND SURFACE EL. +4.8

0.5 (TOPSOIL)

BROWN TO DARK BROWN, FINE TO COARSE SAND WITH SOME GRAVEL AND A TRACE OF SILT AND BRICK [SW] (FILL)

5.0

SOFT, FIBEROUS, ORGANIC PEAT MIXED WITH BROWN GRAY SILT AND SAND WITH SOME GRAVEL, STRONG ORGANIC ODOR NOTED [OL] (ORGANIC DEPOSIT)

15.0

BOTTOM OF TEST PIT

DEPTH (FT.)

McPHAIL ASSOCIATES, LLC

NOTES:

1. GROUNDWATER WAS OBSERVED IN OPEN TEST PIT AT A DEPTH OF 4 FEET UPON COMPLETION OF EXCAVATION

2. [] = USCS CLASSIFICATION SYMBOL

JOB NO. 5441

TEST PIT LOG

TEST PIT NO. 6

DATE AUGUST 30, 2012

0 5 10 15 FT.

NORTH ←

→ SOUTH

GROUND SURFACE EL. +15.2

(TOPSOIL)

0

0.3

DARK BROWN, GRAVELLY SAND WITH SOME SILT AND A TRACE OF BRICK AND WOOD CHIPS [SW-SM] (FILL)

UNKNOWN CONCRETE STRUCTURE

STEEL PLATE ON TOP OF UNKNOWN CONCRETE STRUCTURE

3.0

CONCRETE FOOTING

5

CONCRETE FOOTING

7.0

ABANDONED 8" DIA. DUCTILE IRON PIPE

10

GRAY, GRAVELLY SILT AND SAND WITH SHALE AND WEATHERED ROCK THROUGHOUT [GM] (BLASTED BEDROCK FILL)

NOTES:

1. NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION

2. [] = USCS CLASSIFICATION SYMBOL

15

15.0

BOTTOM OF TEST PIT

McPHAIL ASSOCIATES, LLC

JOB NO. 5441

TEST PIT LOG

TEST PIT NO. 7

DATE SEPTEMBER 6, 2012

0 5 10 15 FT.

S. EAST ←

→ N. WEST

GROUND SURFACE EL. +44.9

(TOPSOIL)

0

0.1

COMPACT TO DENSE, GRAY-BROWN, SILTY SAND AND GRAVEL [GM] (FILL)

2.5

COMPACT TO DENSE, ORANGE-BROWN, VERY SEVERELY TO COMPLETELY WEATHERED PEGMATITE VEIN (WEATHERED BEDROCK)

5

6.0

COMPACT TO DENSE, GRAY-BLACK, VERY SEVERELY TO COMPLETELY WEATHERED GRAYWACKE AND SCHIST (WEATHERED BEDROCK)

8.0

VERY DENSE, GRAY BLACK, SEVERELY WEATHERED GRAYWACKE AND SCHIST (WEATHERED BEDROCK)

10

10.0

REFUSAL ON GRAYWACKE AND SCHIST BEDROCK

15

McPHAIL ASSOCIATES, LLC

NOTES:

1. NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION

2. [] = USCS CLASSIFICATION SYMBOL



APPENDIX D

McPhail Associates, LLC
Groundwater Monitoring Reports



APPENDIX E

Results of Geotechnical Laboratory Testing of Soil Samples



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jek
Location: Newport, RI	Checked By: jdt
Boring ID: ---	Sample Type: ---
Sample ID: ---	Test Date: 09/24/12
Depth : ---	Sample Id: ---

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
B-1	S1 Fill	0-2	Moist, dark gray silty sand with gravel	10.4
B-1	S5 Mudline	8-10	Moist, black silty sand	19
B-2	S3 Fill	4-6	Moist, olive brown silty sand with gravel	13.9
B-2	S8 Marine Sand	14-16	Moist, olive brown silty sand	15.6
B-3	S2 Fill	2-4	Moist, grayish brown silty sand	14.8
B-3	S4 Fill	6-8	Moist, dark reddish brown gravel with silt and sand	16.8
B-4	S1 Fill	0-2	Moist, olive brown silty sand with gravel	6.9
B-4	S3 Fill	4-6	Moist, olive brown silty sand	12.3
B-5	S2 Fill	2-4	Moist, gray silty sand with gravel	16.8
B-5	S7 Marine Sand	12-14	Moist, brownish gray silty sand with gravel	69.7

Notes: Temperature of Drying : 110° Celsius



Client: McPhail Associates	Project No: GTX-12211	
Project: Naval Station Newport		
Location: Newport, RI		
Boring ID: ---	Sample Type: ---	Tested By: jek
Sample ID:---	Test Date: 09/24/12	Checked By: jdt
Depth : ---	Sample Id: ---	

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
B-6	S5 Organics	8-10	Moist, olive brown silty sand	14.8
B-6	S7 Glacial Till	12-14	Moist, olive brown silty sand with gravel	11.7
B-7	S1 Fill	0-2	Moist, gray silty sand with gravel	5.9
B-8	S1 Fill	0-2	Moist, dark brown silty sand with gravel	10.3
B-8	S2 Subsoil	2-4	Moist, dark yellowish brown silty gravel with sand	7.5
B-8	S4 Glacial Till	6-8	Moist, gray silty sand with gravel	5.5
B-9	S3 Organics	4-6	Moist, black sand	481.7
B-9	S11 Marine Sand	20-22	Moist, olive brown silty sand	15.1

Notes: Temperature of Drying : 110° Celsius



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jek
Location: Newport, RI	Checked By: jdt
Boring ID: ---	Sample Type: ---
Sample ID: ---	Test Date: 09/24/12
Depth : ---	Sample Id: ---

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
B-10	S2 Fill	2-4	Moist, brown silty sand with gravel	9.8
B-10	S7 Marine Sand	12-14	Moist, olive brown silty sand with gravel	9.8
B-11	S2 Fill	2-4	Moist, dark olive brown silty sand with gravel	9.1
B-11	S13 Marine Sand	24-26	Moist, dark gray sand with silt	25
B-12	S6 Fill	10-12	Moist, olive brown silty sand with gravel	14.3
B-12	S12 Marine Sand	22-24	Moist, dark gray silty sand	23.2
B-13	S1 Fill	0-2	Moist, olive brown silty sand with gravel	9.5
B-13	S2 Weathered Rock	2-4	Moist, gray silty sand	8.2
B-14	S1 Fill	0-2	Moist, olive brown silty sand	14.8
B-14	S7 Weathered Rock	12-14	Moist, olive brown silty sand with gravel	15

Notes: Temperature of Drying : 110° Celsius



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	09/19/12
Tested By:	jbr
Checked By:	jdt

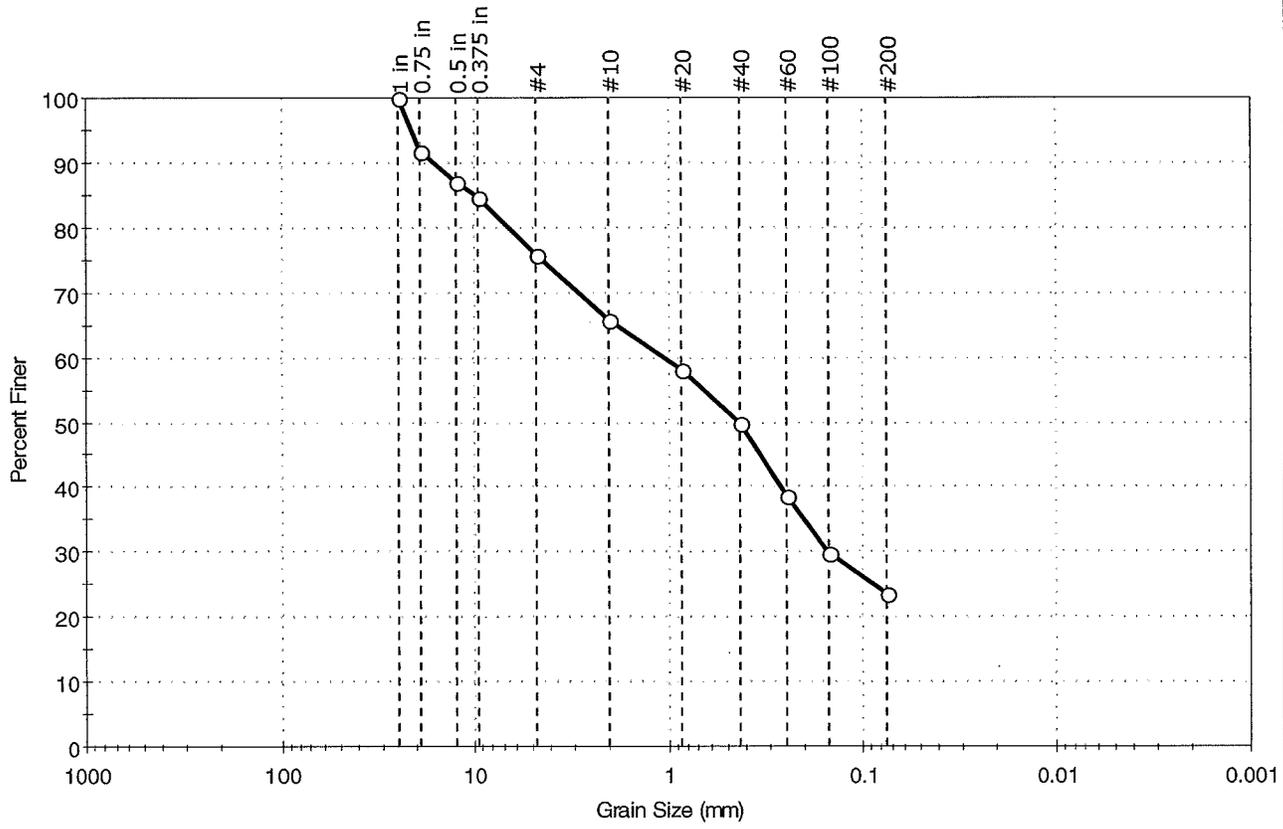
Percent Finer Than #200 Sieve - ASTM C 117

Boring ID	Sample ID	Depth	Visual Description	Fines, %
B-1	S1 Fill	0-2	Moist, dark gray silty sand with gravel	24
B-1	S5 Mudline	8-10	Moist, black silty sand	13
B-2	S3 Fill	4-6	Moist, olive brown silty sand with gravel	34
B-2	S8 Marine Sand	14-16	Moist, olive brown silt sand	13
B-3	S2 Fill	2-4	Moist, grayish brown silty sand	31
B-3	S4 Fill	6-8	Moist, dark reddish brown gravel with silt and sand	11
B-4	S1 Fill	0-2	Moist, olive brown silty sand with gravel	21
B-4	S3 Fill	4-6	Moist, olive brown silty sand	24
B-5	S2 Fill	2-4	Moist, gray silty sand with gravel	28
B-5	S7 Marine Sand	12-14	Moist, brownish gray silty sand with gravel	34
B-6	S5 Organics	8-10	Moist, olive brown silty sand	38
B-6	S7 Glacial Till	12-14	Moist, olive brown silty sand with gravel	32
B-7	S1 Fill	0-2	Moist, gray silty sand with gravel	21
B-8	S1 Fill	0-2	Moist, dark brown silty sand with gravel	27
B-8	S2 Subsoil	2-4	Moist, dark yellowish brown silty gravel with sand	18
B-8	S4 Glacial Till	6-8	Moist, gray silty sand with gravel	23
B-9	S3 Organics	4-6	Moist, black sand	2.1
B-9	S11 Marine Sand	20-22	Moist, olive brown silty sand	33
B-10	S2 Fill	2-4	Moist, brown silty sand with gravel	17
B-10	S7 Marine Sand	12-14	Moist, olive brown silty sand with gravel	32
B-11	S2 Fill	2-4	Moist, dark olive brown silty sand with gravel	31
B-11	S13 Marine Sand	24-26	Moist, dark gray sand with silt	8.8
B-12	S6 Fill	10-12	Moist, olive brown silty sand with gravel	37
B-12	S12 Marine Sand	22-24	Moist, dark gray silty sand	14
B-13	S1 Fill	0-2	Moist, olive brown silty sand with gravel	37
B-13	S2 Weathered Rock	2-4	Moist, gray silty sand	21
B-14	S1 Fill	0-2	Moist, olive brown silty sand	48
B-14	S7 Weathered Rock	12-14	Moist, olive brown silty sand with gravel	23



Client: McPhail Associates	Project: Naval Station Newport	Location: Newport, RI	Project No: GTX-12211
Boring ID: B-1	Sample Type: jar	Tested By: jbr	Checked By: jdt
Sample ID: S1 Fill	Test Date: 09/18/12	Test Id: 249390	
Depth: 0-2			
Test Comment: ---			
Sample Description: Moist, dark gray silty sand with gravel			
Sample Comment: ---			

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	24.2	52.3	23.5

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	87		
0.375 in	9.50	85		
#4	4.75	76		
#10	2.00	66		
#20	0.85	58		
#40	0.42	50		
#60	0.25	39		
#100	0.15	30		
#200	0.075	24		

<u>Coefficients</u>	
D ₈₅ = 9.9968 mm	D ₃₀ = 0.1516 mm
D ₆₀ = 1.0442 mm	D ₁₅ = N/A
D ₅₀ = 0.4277 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

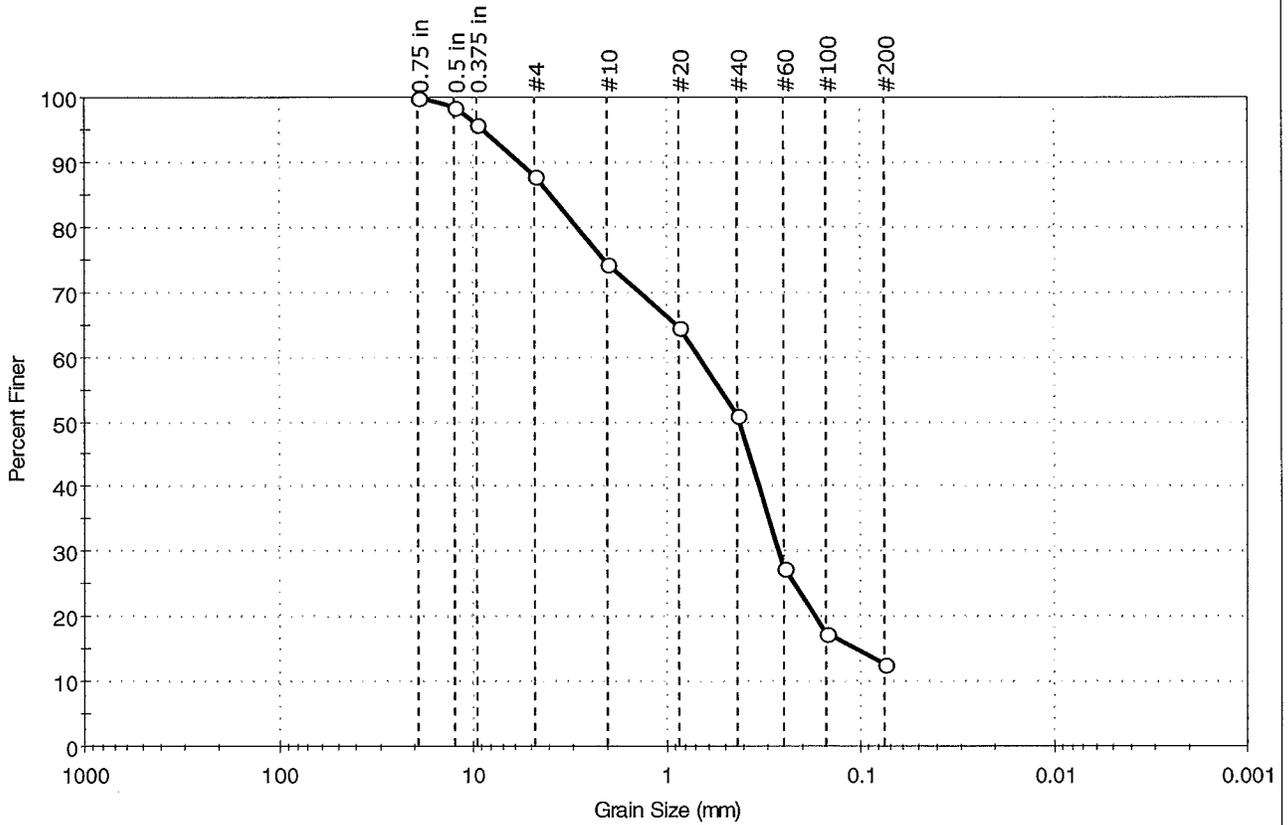
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>	
Sand/Gravel Particle Shape : ANGULAR	
Sand/Gravel Hardness : HARD	



Client: McPhail Associates	Project No: GTX-12211	
Project: Naval Station Newport		
Location: Newport, RI	Boring ID: B-1	Sample Type: jar
	Sample ID: S5 Mudline	Test Date: 09/20/12
	Depth: 8-10	Test Id: 249391
Test Comment: ---	Tested By: jbr	Checked By: jdt
Sample Description: Moist, black silty sand		
Sample Comment: ---		

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	12.1	75.3	12.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	98		
0.375 in	9.50	96		
#4	4.75	88		
#10	2.00	74		
#20	0.85	65		
#40	0.42	51		
#60	0.25	27		
#100	0.15	18		
#200	0.075	13		

Coefficients	
D ₈₅ = 3.9479 mm	D ₃₀ = 0.2650 mm
D ₆₀ = 0.6712 mm	D ₁₅ = 0.1053 mm
D ₅₀ = 0.4164 mm	D ₁₀ = 0.0520 mm
C _u = N/A	C _c = N/A

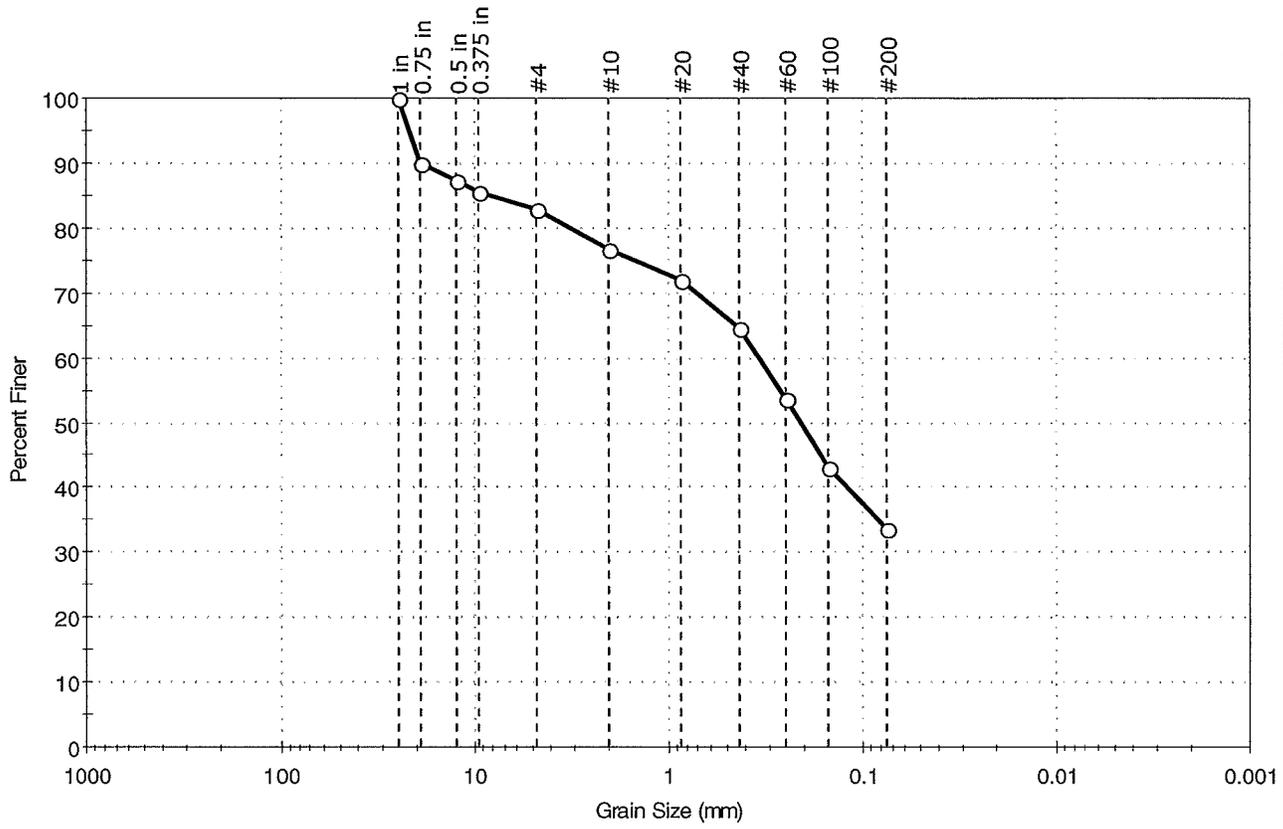
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-2	Sample Type: jar
Sample ID: S3 Fill	Test Date: 09/20/12
Depth: 4-6	Test Id: 249392
Test Comment: ---	Tested By: jbr
Sample Description: Moist, olive brown silty sand with gravel	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	17.1	49.3	33.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	90		
0.5 in	12.50	87		
0.375 in	9.50	86		
#4	4.75	83		
#10	2.00	77		
#20	0.85	72		
#40	0.42	65		
#60	0.25	54		
#100	0.15	43		
#200	0.075	34		

<u>Coefficients</u>	
D ₈₅ = 8.2002 mm	D ₃₀ = N/A
D ₆₀ = 0.3408 mm	D ₁₅ = N/A
D ₅₀ = 0.2104 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

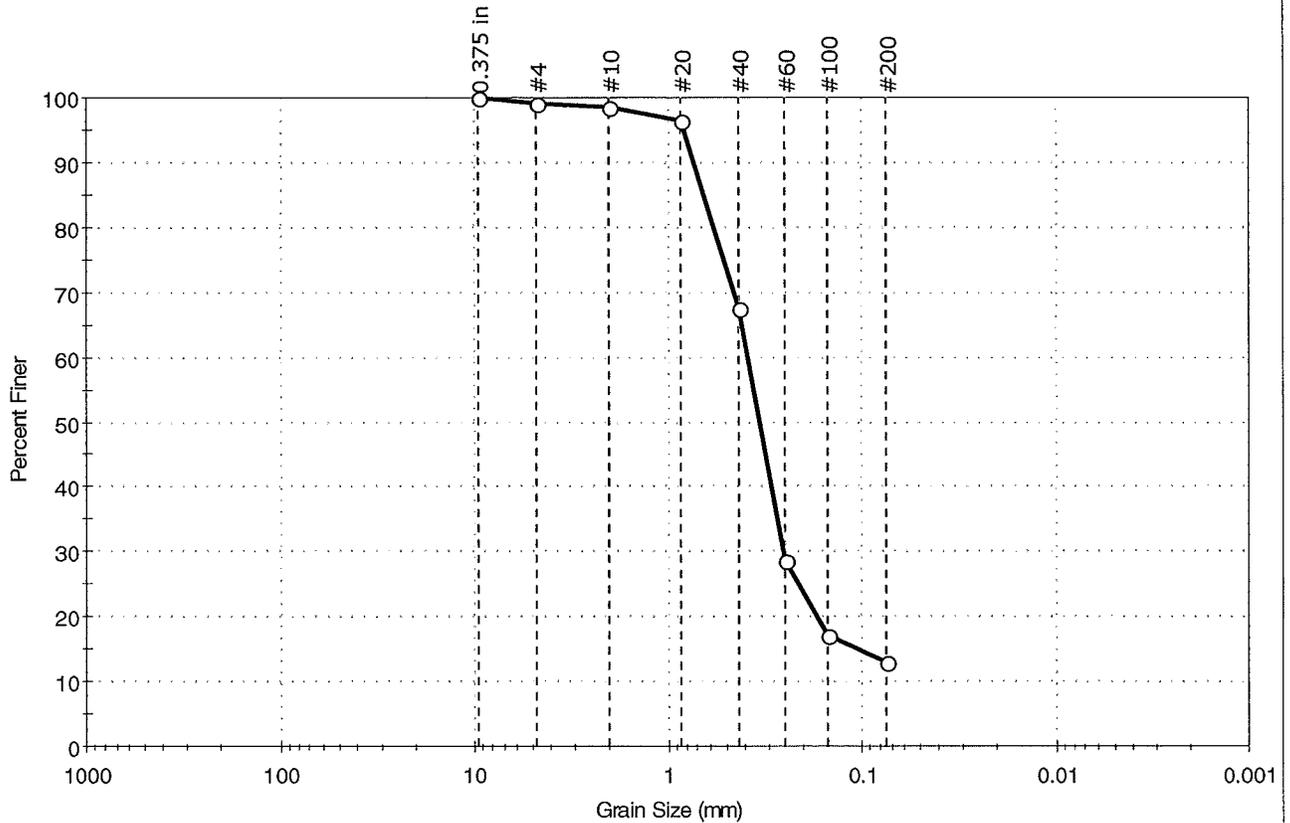
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-2	Sample Type: jar
Sample ID: S8 Marine Sand	Tested By: jbr
Depth: 14-16	Test Date: 09/21/12
	Checked By: jdt
Test Comment: ---	Test Id: 249393
Sample Description: Moist, olive brown silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.9	86.3	12.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	99		
#20	0.85	97		
#40	0.42	67		
#60	0.25	29		
#100	0.15	17		
#200	0.075	13		

Coefficients	
D ₈₅ = 0.6457 mm	D ₃₀ = 0.2543 mm
D ₆₀ = 0.3837 mm	D ₁₅ = 0.1065 mm
D ₅₀ = 0.3345 mm	D ₁₀ = 0.0474 mm
C _u = N/A	C _c = N/A

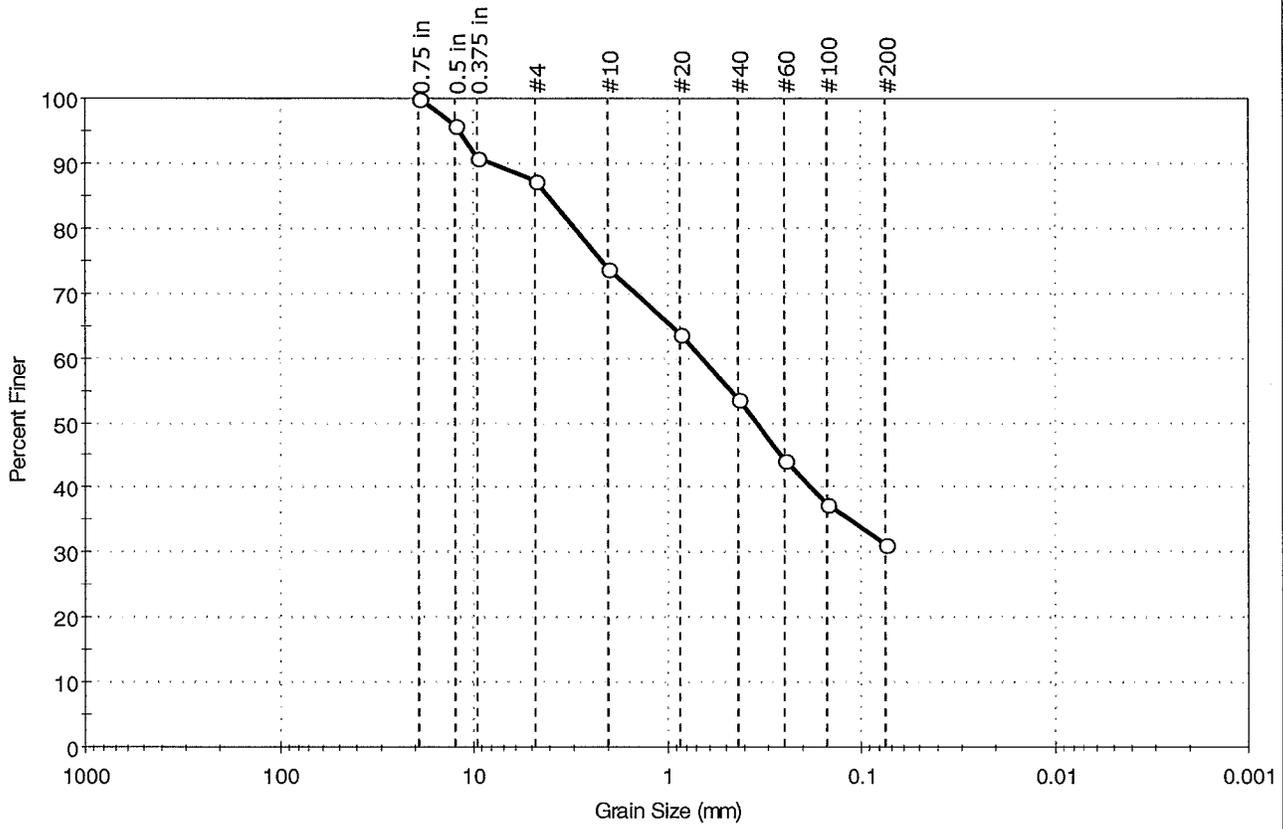
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project: Naval Station Newport	Location: Newport, RI	Project No: GTX-12211
Boring ID: B-3	Sample Type: jar	Tested By: jbr	
Sample ID: S2 Fill	Test Date: 09/20/12	Checked By: jdt	
Depth: 2-4	Test Id: 249394		
Test Comment: ---			
Sample Description: Moist, grayish brown silty sand			
Sample Comment: ---			

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	12.7	55.9	31.4

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	91		
#4	4.75	87		
#10	2.00	74		
#20	0.85	64		
#40	0.42	54		
#60	0.25	44		
#100	0.15	37		
#200	0.075	31		

Coefficients

D ₈₅ = 4.0951 mm	D ₃₀ = N/A
D ₆₀ = 0.6558 mm	D ₁₅ = N/A
D ₅₀ = 0.3462 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))

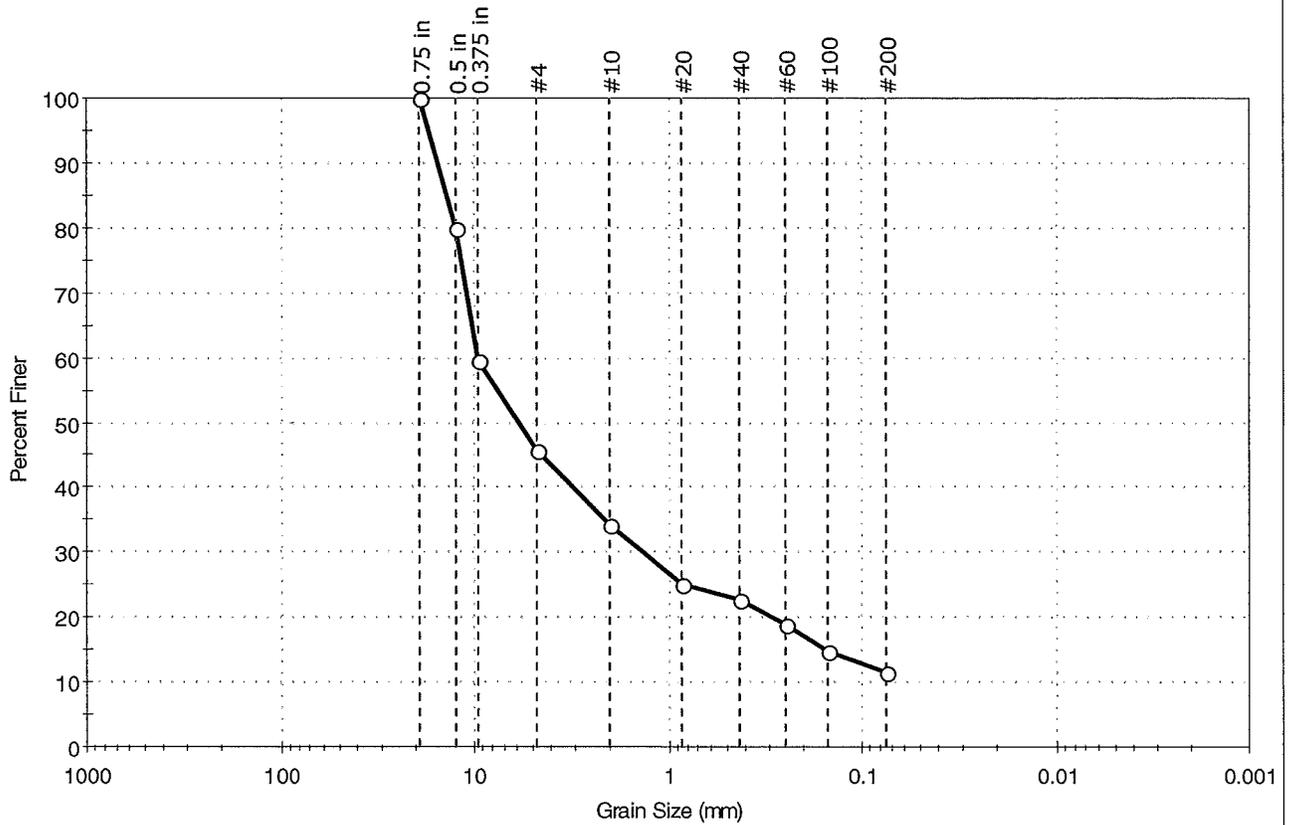
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
 Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-3	Sample Type: jar
Sample ID: S4 Fill	Tested By: jbr
Depth: 6-8	Test Date: 09/20/12
	Checked By: jdt
	Test Id: 249395
Test Comment: ---	
Sample Description: Moist, dark reddish brown gravel with silt and sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	54.2	34.4	11.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	80		
0.375 in	9.50	60		
#4	4.75	46		
#10	2.00	34		
#20	0.85	25		
#40	0.42	23		
#60	0.25	19		
#100	0.15	15		
#200	0.075	11		

<u>Coefficients</u>	
D ₈₅ = 13.8958 mm	D ₃₀ = 1.3349 mm
D ₆₀ = 9.5558 mm	D ₁₅ = 0.1533 mm
D ₅₀ = 5.8760 mm	D ₁₀ = 0.0568 mm
C _u = 168.236	C _c = 3.283

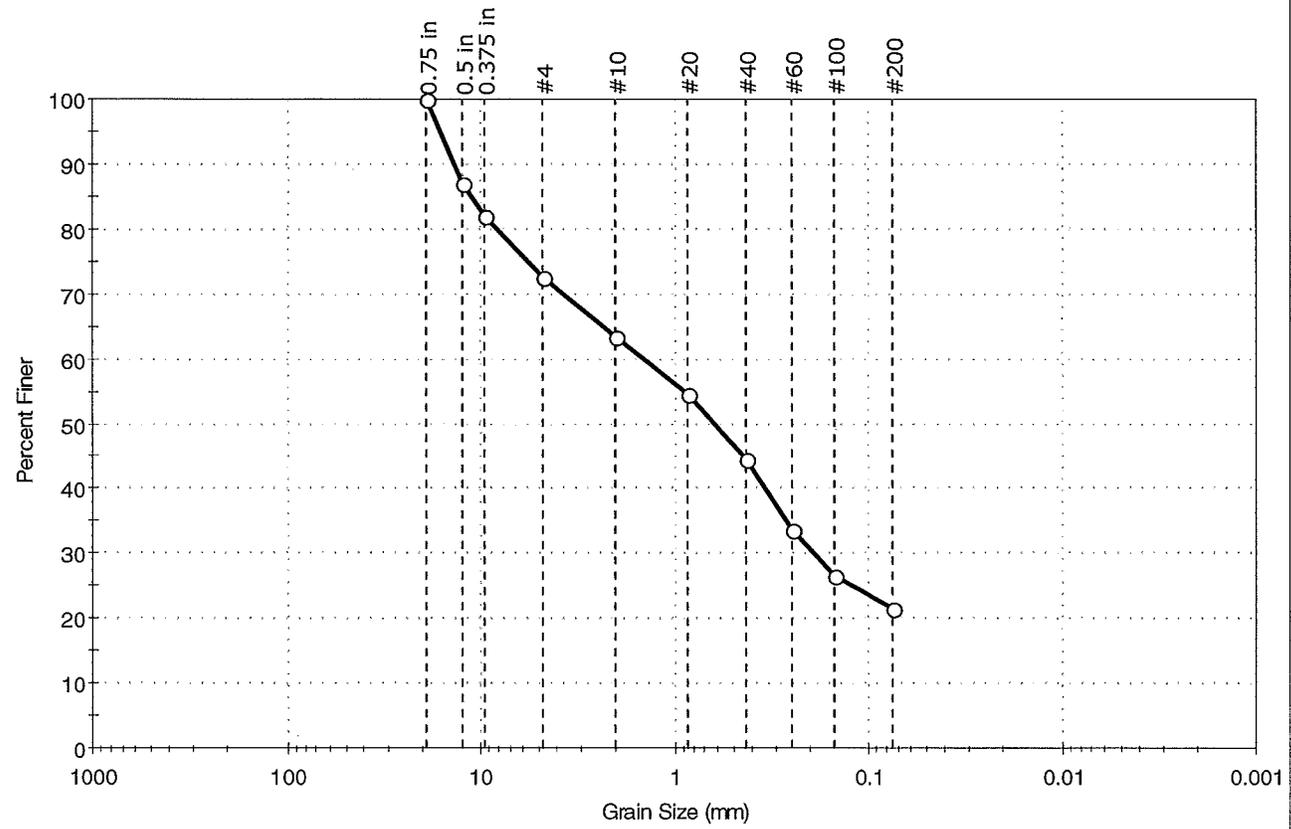
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-a (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-4	Sample Type: jar
Sample ID: S1 Fill	Tested By: jbr
Depth: 0-2	Test Date: 09/13/12
	Checked By: jdt
	Test Id: 249396
Test Comment: ---	
Sample Description: Moist, olive brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	27.6	51.0	21.4

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	72		
#10	2.00	63		
#20	0.85	54		
#40	0.42	45		
#60	0.25	34		
#100	0.15	27		
#200	0.075	21		

Coefficients	
D ₈₅ = 11.1925 mm	D ₃₀ = 0.1922 mm
D ₆₀ = 1.4475 mm	D ₁₅ = N/A
D ₅₀ = 0.6219 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

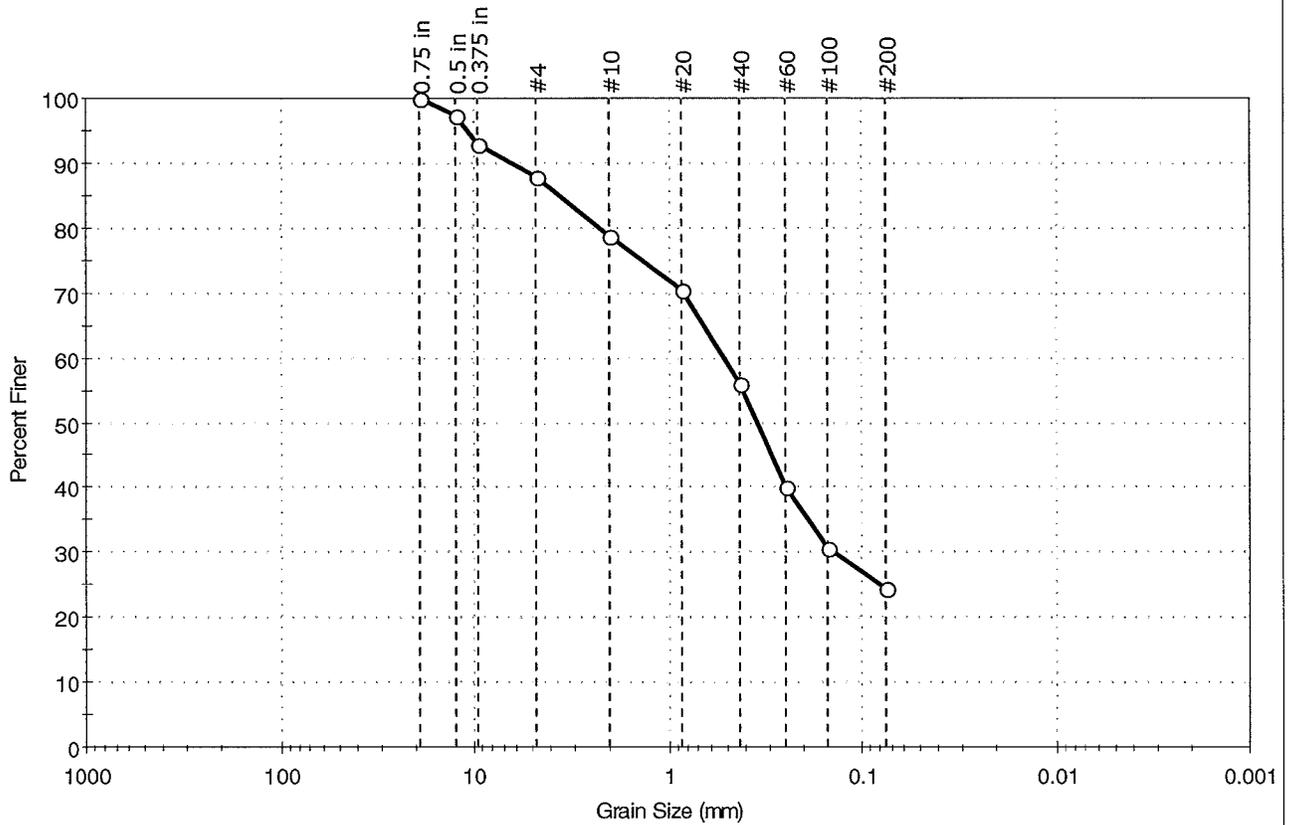
Classification	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-4	Sample Type: jar
Sample ID: S3 Fill	Test Date: 09/20/12
Depth: 4-6	Test Id: 249397
Tested By: jbr	Checked By: jdt
Test Comment: ---	
Sample Description: Moist, olive brown silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	12.1	63.5	24.4

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	93		
#4	4.75	88		
#10	2.00	79		
#20	0.85	71		
#40	0.42	56		
#60	0.25	40		
#100	0.15	31		
#200	0.075	24		

Coefficients	
D ₈₅ = 3.5835 mm	D ₃₀ = 0.1380 mm
D ₆₀ = 0.5122 mm	D ₁₅ = N/A
D ₅₀ = 0.3471 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

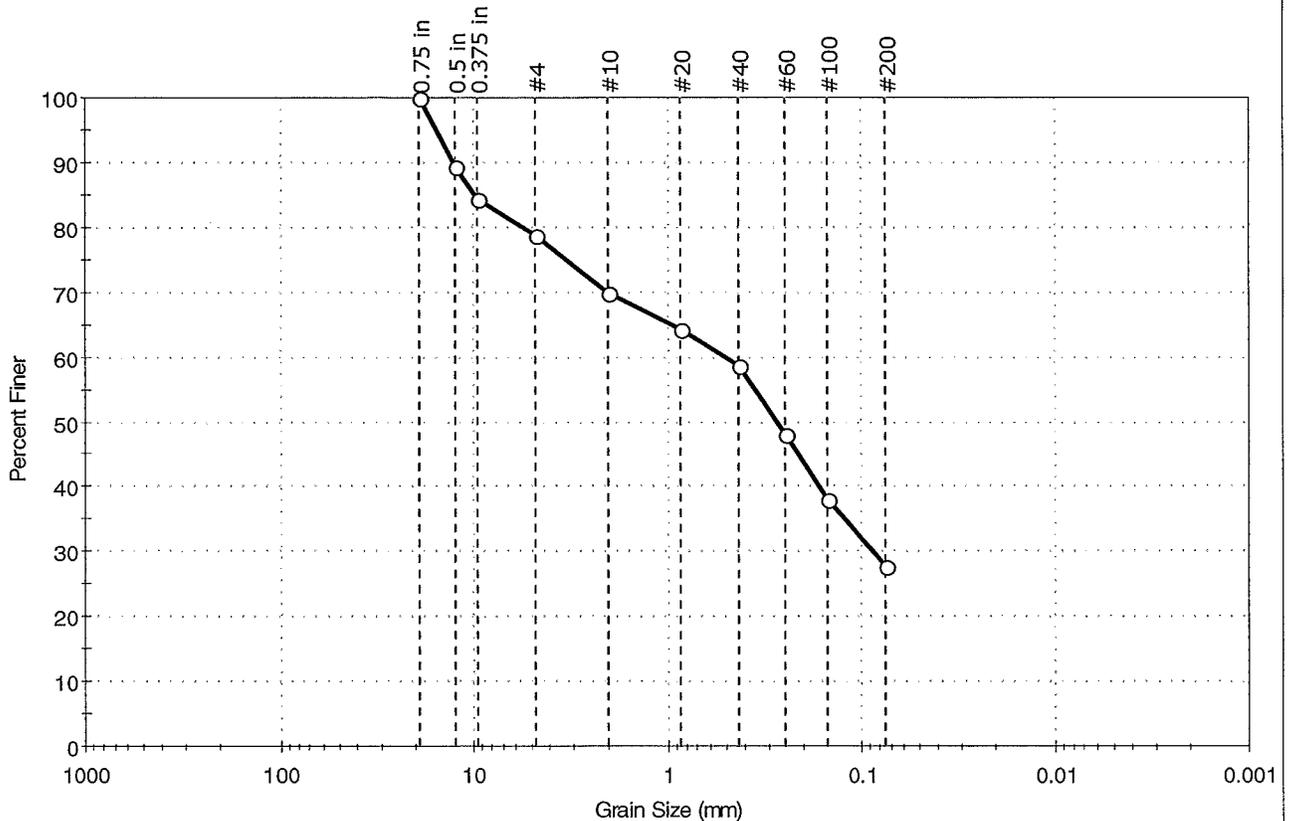
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project: Naval Station Newport	Location: Newport, RI	Project No: GTX-12211
Boring ID: B-5	Sample Type: jar	Tested By: jbr	Checked By: jdt
Sample ID: S2 Fill	Test Date: 09/20/12	Test ID: 249398	
Depth: 2-4			
Test Comment: ---			
Sample Description: Moist, gray silty sand with gravel			
Sample Comment: ---			

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	21.3	50.9	27.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	89		
0.375 in	9.50	84		
#4	4.75	79		
#10	2.00	70		
#20	0.85	64		
#40	0.42	59		
#60	0.25	48		
#100	0.15	38		
#200	0.075	28		

<u>Coefficients</u>	
D ₈₅ = 9.8136 mm	D ₃₀ = 0.0870 mm
D ₆₀ = 0.4975 mm	D ₁₅ = N/A
D ₅₀ = 0.2740 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

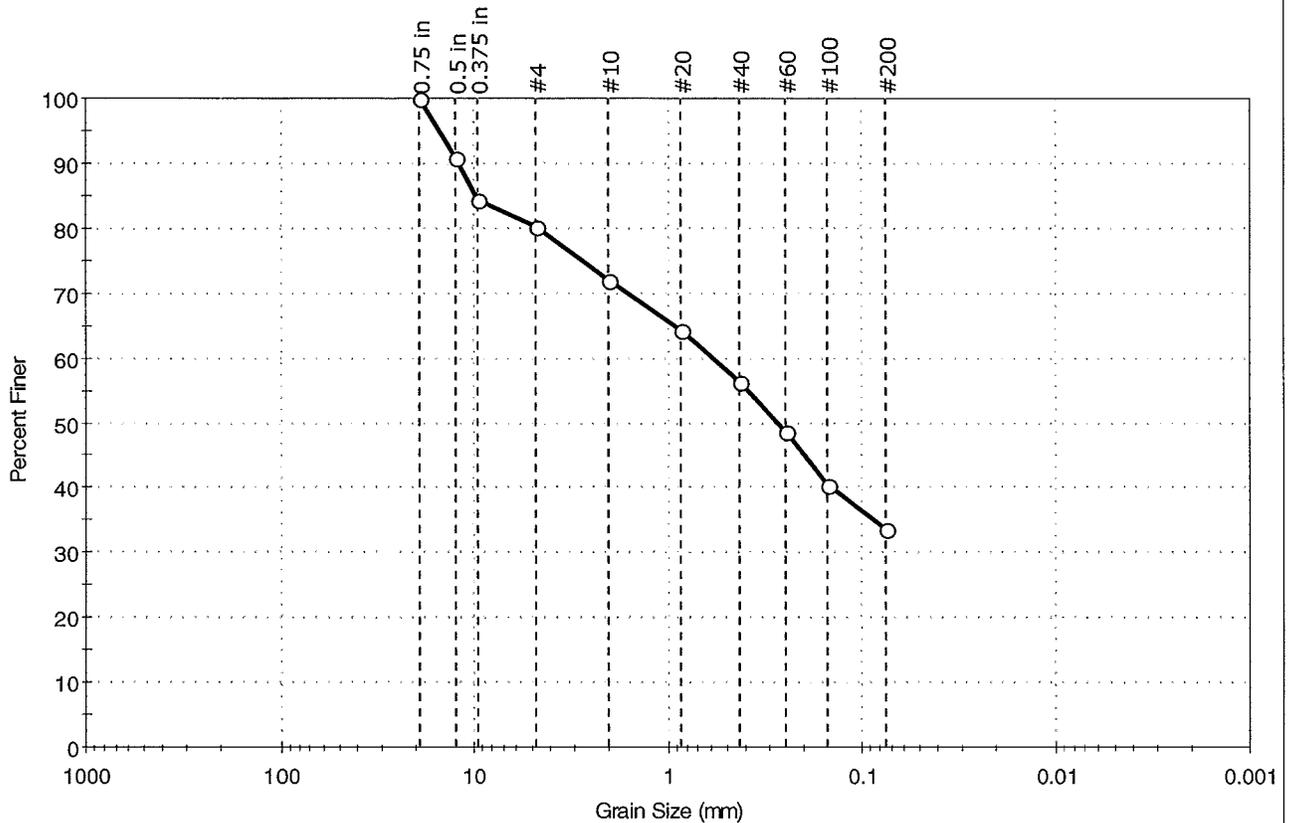
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-5	Sample Type: jar
Sample ID: S7 Marine Sand	Tested By: jbr
Depth: 12-14	Test Date: 09/21/12
	Checked By: jdt
Test Id: 249399	
Test Comment: ---	
Sample Description: Moist, brownish gray silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	19.9	46.4	33.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	91		
0.375 in	9.50	84		
#4	4.75	80		
#10	2.00	72		
#20	0.85	64		
#40	0.42	56		
#60	0.25	49		
#100	0.15	40		
#200	0.075	34		

<u>Coefficients</u>	
D ₈₅ = 9.7272 mm	D ₃₀ = N/A
D ₆₀ = 0.5837 mm	D ₁₅ = N/A
D ₅₀ = 0.2756 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

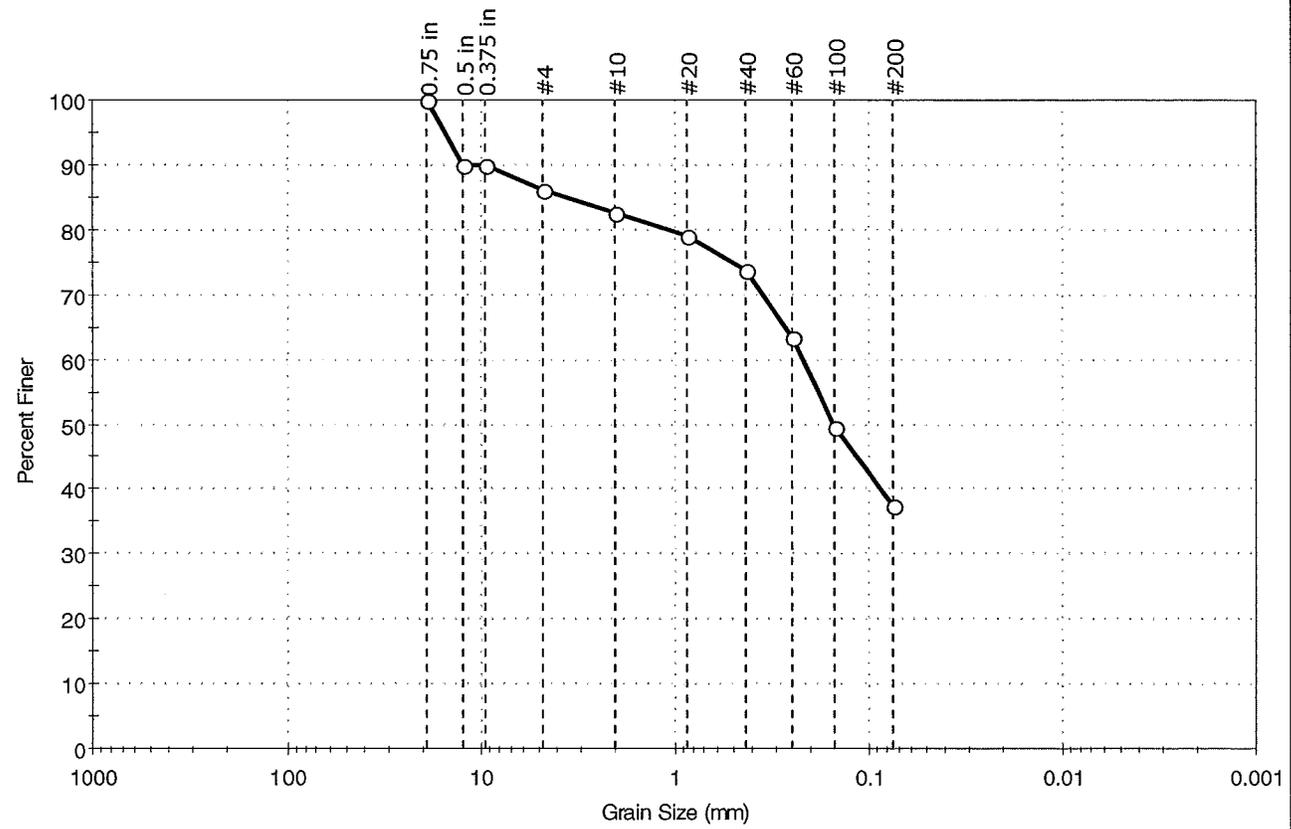
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-6	Sample Type: jar
Sample ID: S5 Organics	Test Date: 09/21/12
Depth: 8-10	Test Id: 249400
Test Comment: ---	
Sample Description: Moist, olive brown silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	13.8	48.7	37.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	90		
0.375 in	9.50	90		
#4	4.75	86		
#10	2.00	82		
#20	0.85	79		
#40	0.42	74		
#60	0.25	64		
#100	0.15	50		
#200	0.075	37		

Coefficients	
D ₈₅ = 3.5752 mm	D ₃₀ = N/A
D ₆₀ = 0.2197 mm	D ₁₅ = N/A
D ₅₀ = 0.1524 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

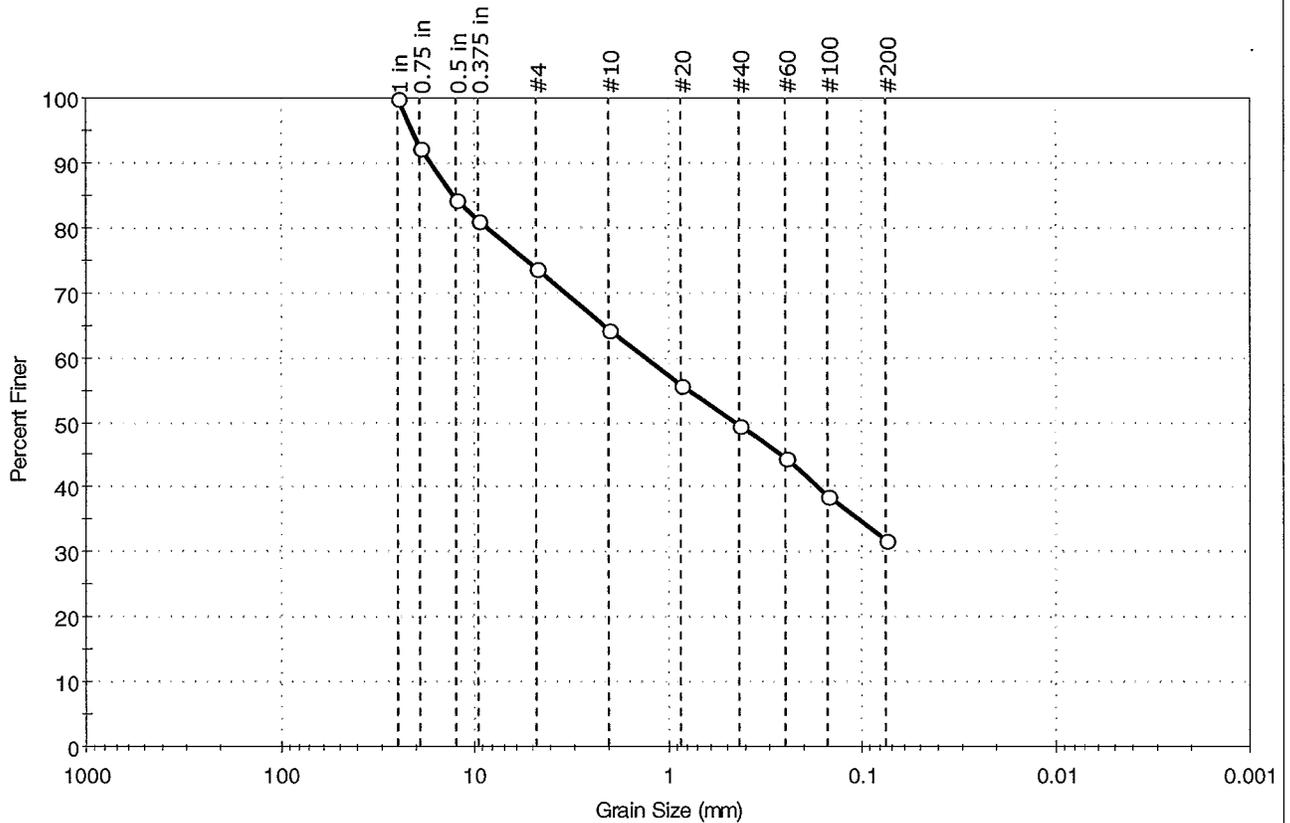
Classification	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-6	Sample Type: jar
Sample ID: S7 Glacial Till	Tested By: jbr
Depth: 12-14	Test Date: 09/21/12
	Checked By: jdt
	Test Id: 249401
Test Comment: ---	
Sample Description: Moist, olive brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	26.1	41.9	32.0

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	84		
0.375 in	9.50	81		
#4	4.75	74		
#10	2.00	64		
#20	0.85	56		
#40	0.42	49		
#60	0.25	44		
#100	0.15	39		
#200	0.075	32		

<u>Coefficients</u>	
D ₈₅ = 12.9301 mm	D ₃₀ = N/A
D ₆₀ = 1.2961 mm	D ₁₅ = N/A
D ₅₀ = 0.4492 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

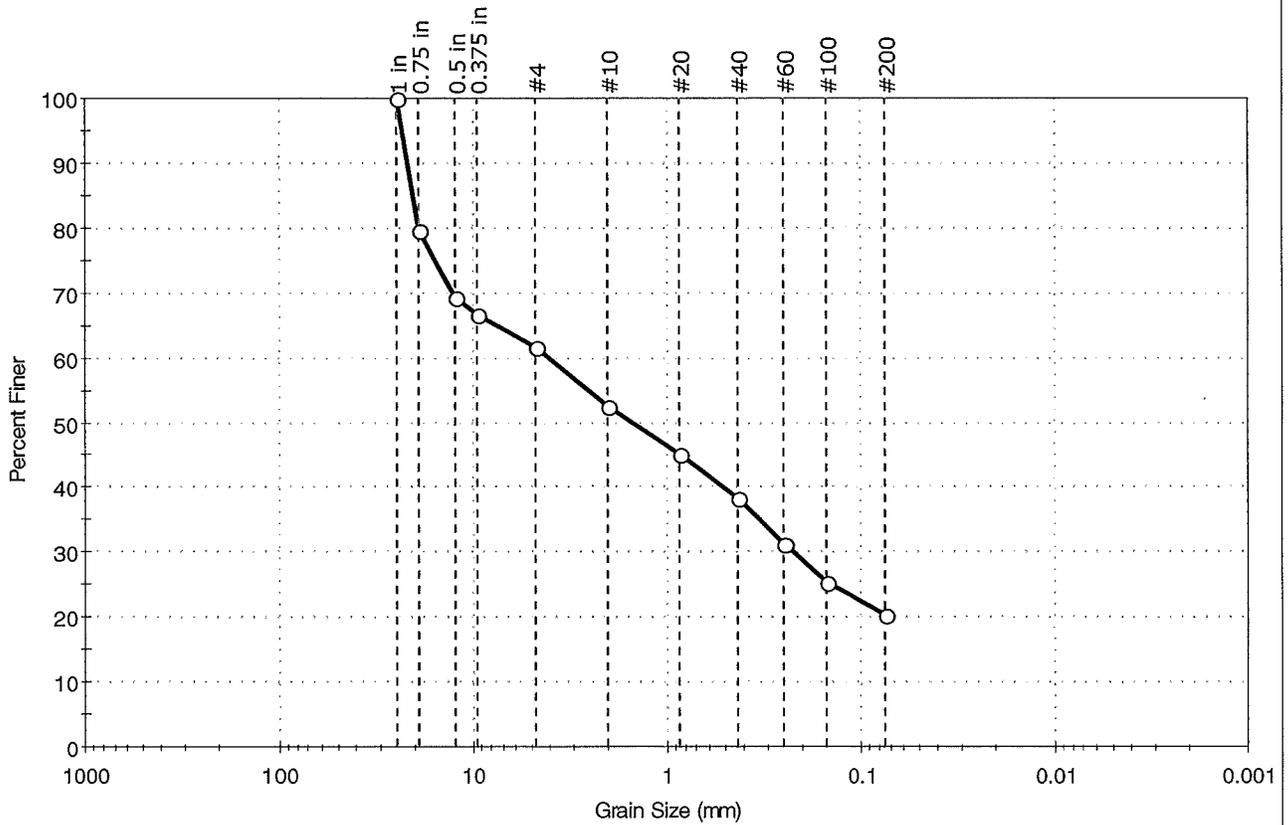
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-7	Sample Type: jar
Sample ID: S1 Fill	Test Date: 09/20/12
Depth: 0-2	Test Id: 249402
Test Comment: ---	Tested By: jbr
Sample Description: Moist, gray silty sand with gravel	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	38.3	41.2	20.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	80		
0.5 in	12.50	69		
0.375 in	9.50	67		
#4	4.75	62		
#10	2.00	53		
#20	0.85	45		
#40	0.42	38		
#60	0.25	31		
#100	0.15	26		
#200	0.075	20		

Coefficients	
D ₈₅ = 20.4256 mm	D ₃₀ = 0.2242 mm
D ₆₀ = 4.0546 mm	D ₁₅ = N/A
D ₅₀ = 1.4778 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

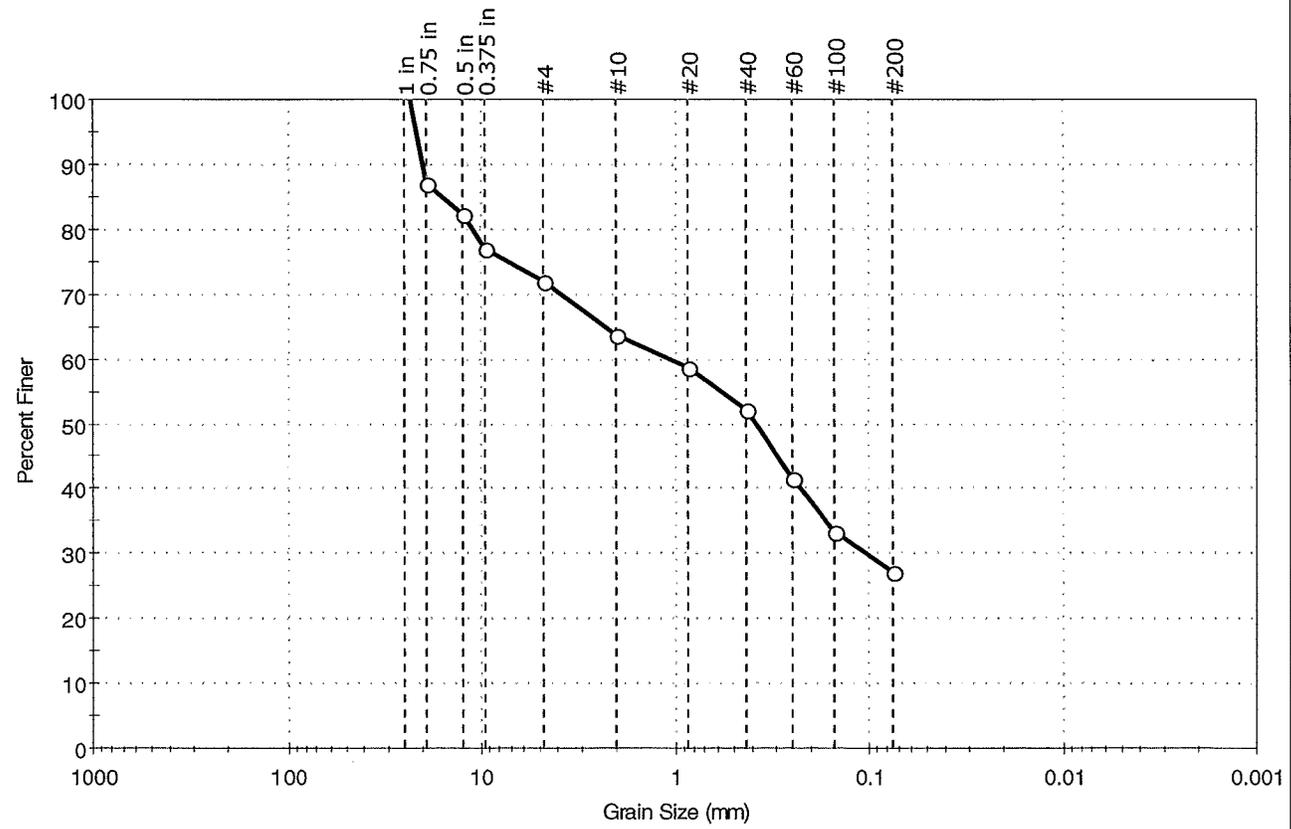
Classification	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-8	Sample Type: jar
Sample ID: S1 Fill	Test Date: 09/21/12
Depth: 0-2	Test Id: 250050
Test Comment: ---	
Sample Description: Moist, dark brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	28.0	44.7	27.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	87		
0.5 in	12.50	82		
0.375 in	9.50	77		
#4	4.75	72		
#10	2.00	64		
#20	0.85	59		
#40	0.42	52		
#60	0.25	42		
#100	0.15	33		
#200	0.075	27		

Coefficients

D ₈₅ = 15.8603 mm	D ₃₀ = 0.1024 mm
D ₆₀ = 1.0383 mm	D ₁₅ = N/A
D ₅₀ = 0.3814 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))	

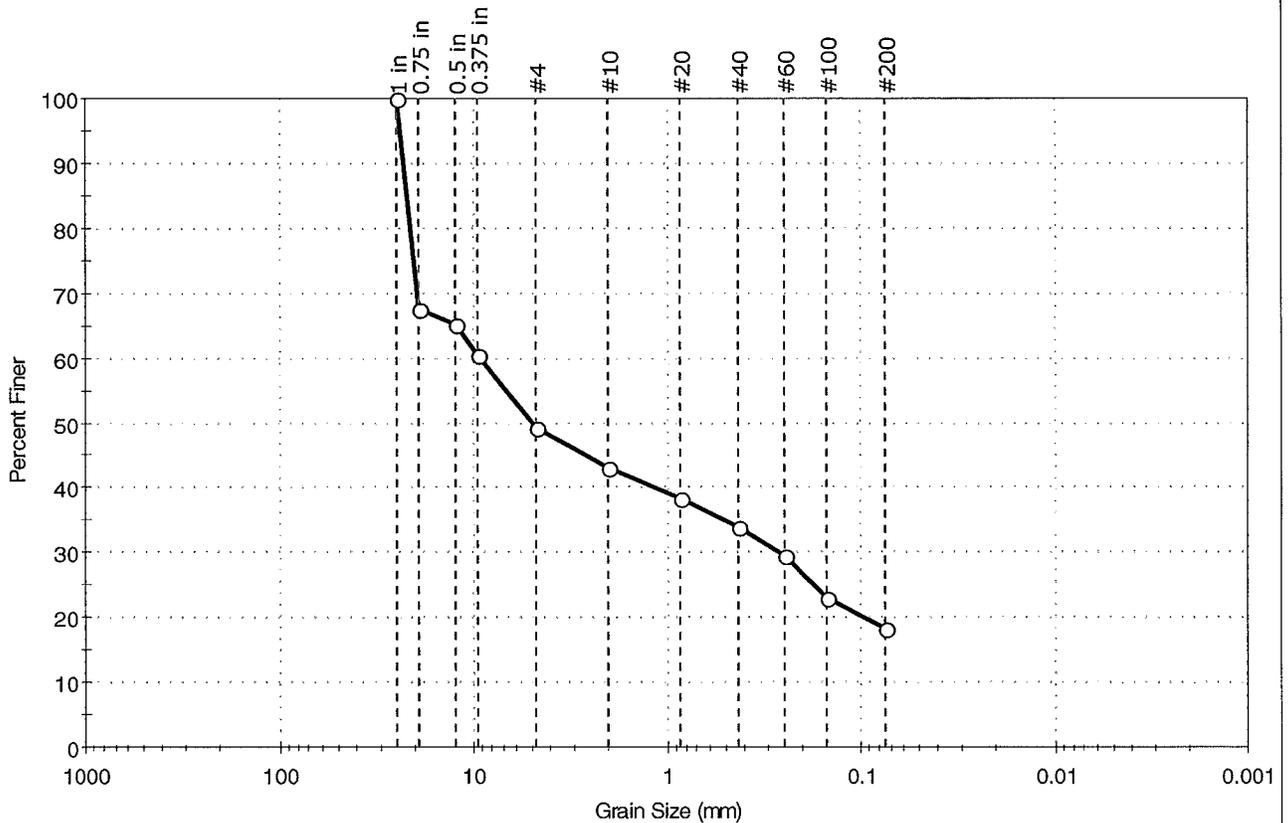
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
 Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-8	Sample Type: jar
Sample ID: S2 Subsoil	Test Date: 09/20/12
Depth: 2-4	Test Id: 249404
Test Comment: ---	Tested By: jbr
Sample Description: Moist, dark yellowish brown silty gravel with sand	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	50.8	30.8	18.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	68		
0.5 in	12.50	65		
0.375 in	9.50	60		
#4	4.75	49		
#10	2.00	43		
#20	0.85	38		
#40	0.42	34		
#60	0.25	30		
#100	0.15	23		
#200	0.075	18		

Coefficients	
D ₈₅ = 22.0200 mm	D ₃₀ = 0.2649 mm
D ₆₀ = 9.2613 mm	D ₁₅ = N/A
D ₅₀ = 4.9766 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

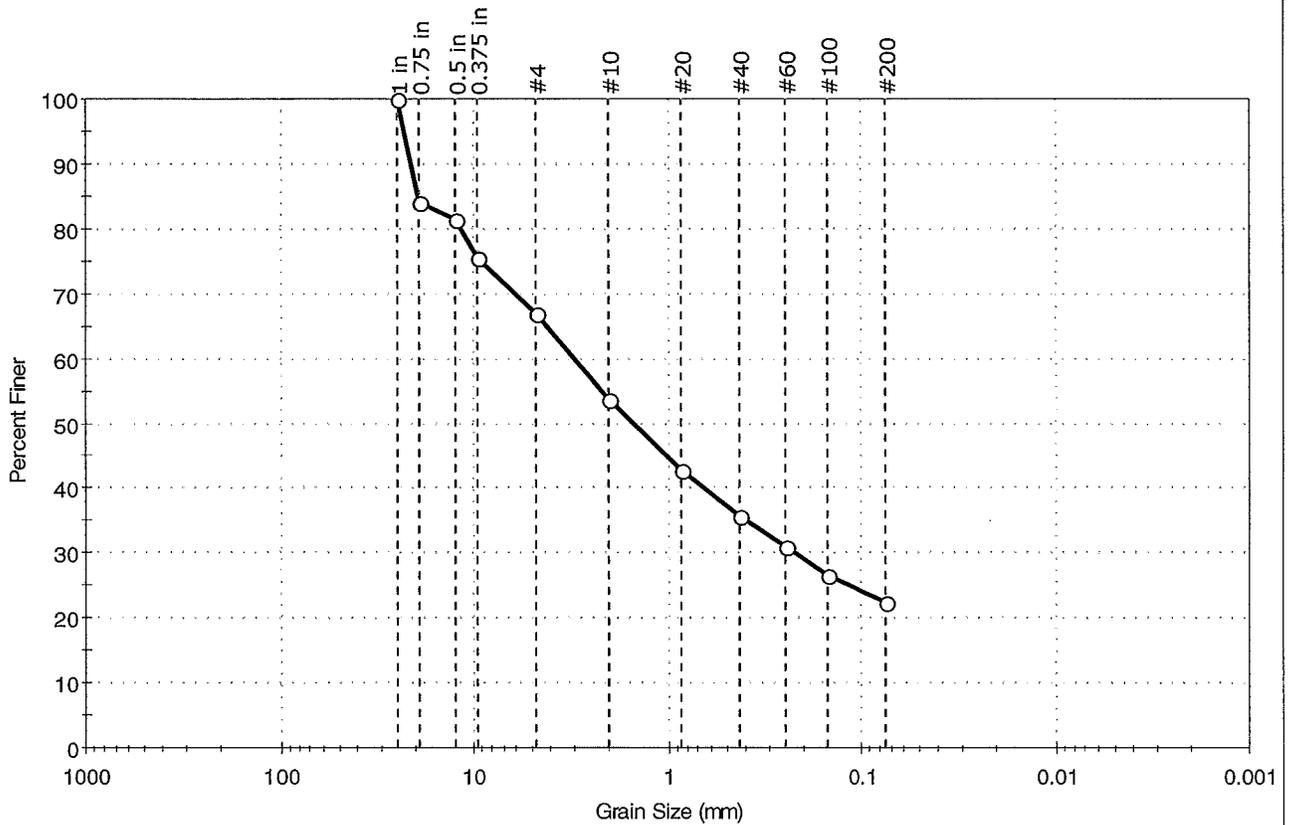
Classification	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-8	Sample Type: jar
Sample ID: S4 Glacial Till	Tested By: jbr
Depth: 6-8	Test Date: 09/20/12
	Checked By: jdt
Test Comment: ---	Test Id: 249405
Sample Description: Moist, gray silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	33.0	44.4	22.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	84		
0.5 in	12.50	81		
0.375 in	9.50	76		
#4	4.75	67		
#10	2.00	54		
#20	0.85	43		
#40	0.42	36		
#60	0.25	31		
#100	0.15	26		
#200	0.075	23		

Coefficients	
D ₈₅ = 19.3063 mm	D ₃₀ = 0.2265 mm
D ₆₀ = 3.0287 mm	D ₁₅ = N/A
D ₅₀ = 1.5043 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

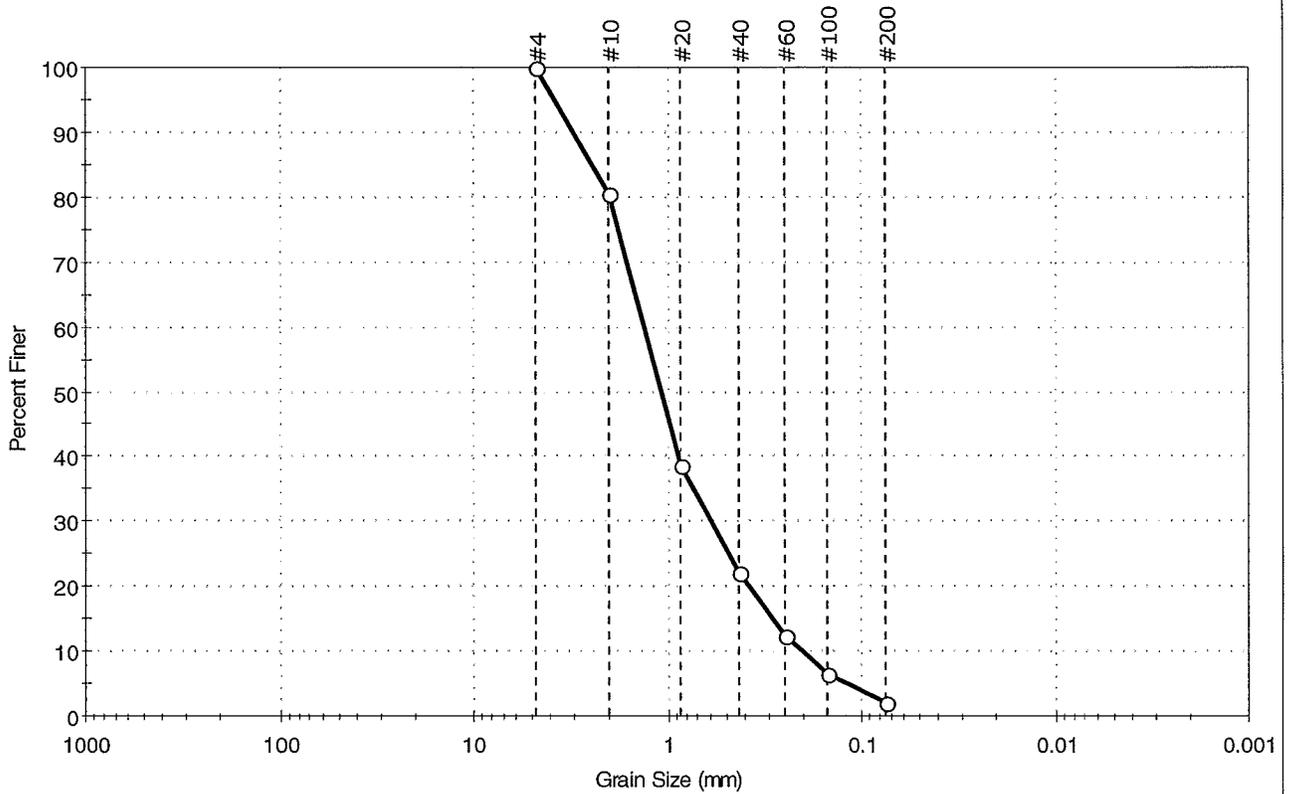
Classification	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description	
Sand/Gravel Particle Shape	: ANGULAR
Sand/Gravel Hardness	: HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-9	Sample Type: jar
Sample ID: S3 Organics	Test Date: 09/20/12
Depth: 4-6	Test ID: 249406
Test Comment: ---	Tested By: jbr
Sample Description: Moist, black sand	Checked By: jdt
Sample Comment:	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	—	97.9	2.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	81		
#20	0.85	39		
#40	0.42	22		
#60	0.25	12		
#100	0.15	6		
#200	0.075	2		

Coefficients	
D ₈₅ = 2.4375 mm	D ₃₀ = 0.5904 mm
D ₆₀ = 1.3137 mm	D ₁₅ = 0.2870 mm
D ₅₀ = 1.0708 mm	D ₁₀ = 0.2029 mm
C _u = 6.475	C _c = 1.308

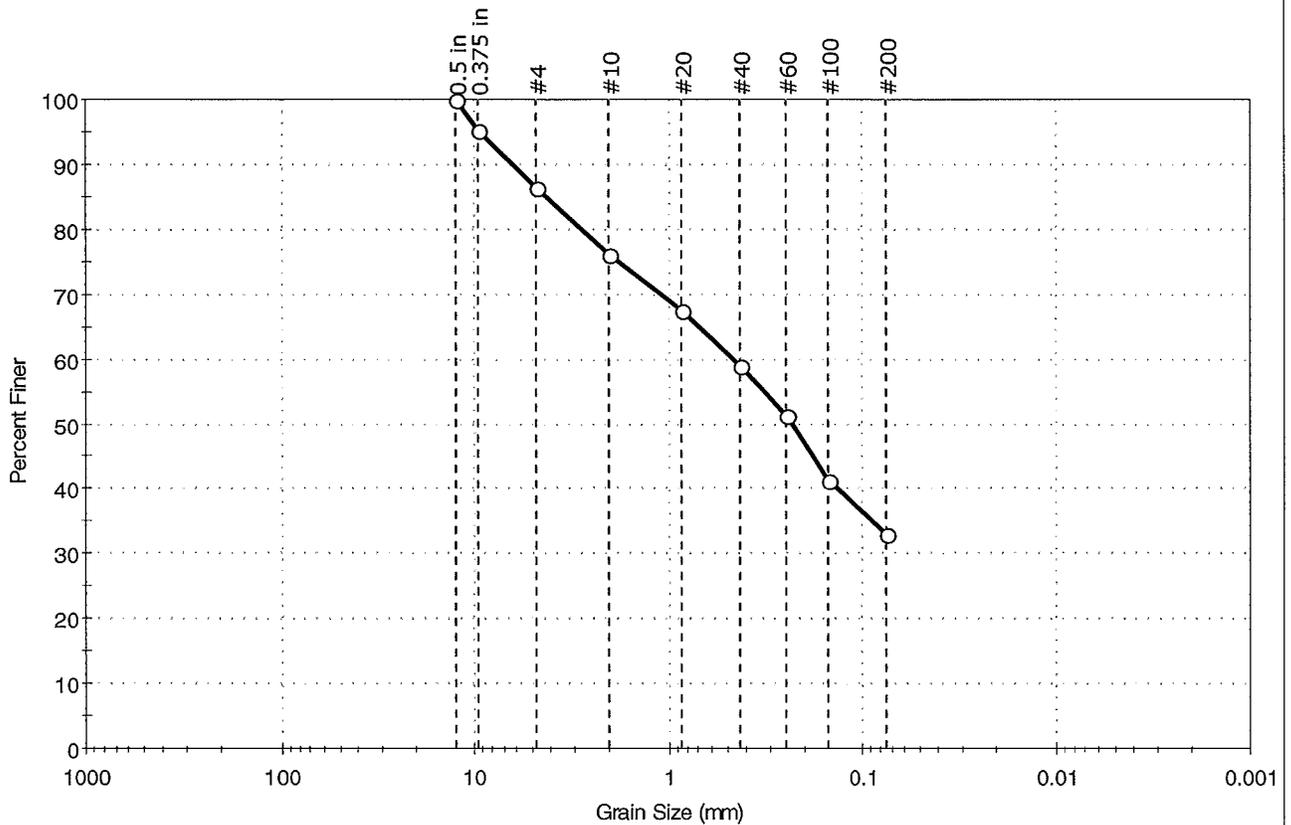
Classification	
ASTM	Well-graded sand (SW)
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description	
Sand/Gravel Particle Shape : ROUNDED	
Sand/Gravel Hardness : HARD	



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-9	Sample Type: jar
Sample ID: S11 Marine Sand	Test Date: 09/20/12
Depth: 20-22	Test ID: 249407
Tested By: jbr	Checked By: jdt
Test Comment: ---	
Sample Description: Moist, olive brown silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	13.5	53.5	33.0

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	87		
#10	2.00	76		
#20	0.85	67		
#40	0.42	59		
#60	0.25	51		
#100	0.15	41		
#200	0.075	33		

<u>Coefficients</u>	
D ₈₅ = 4.1912 mm	D ₃₀ = N/A
D ₆₀ = 0.4605 mm	D ₁₅ = N/A
D ₅₀ = 0.2354 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

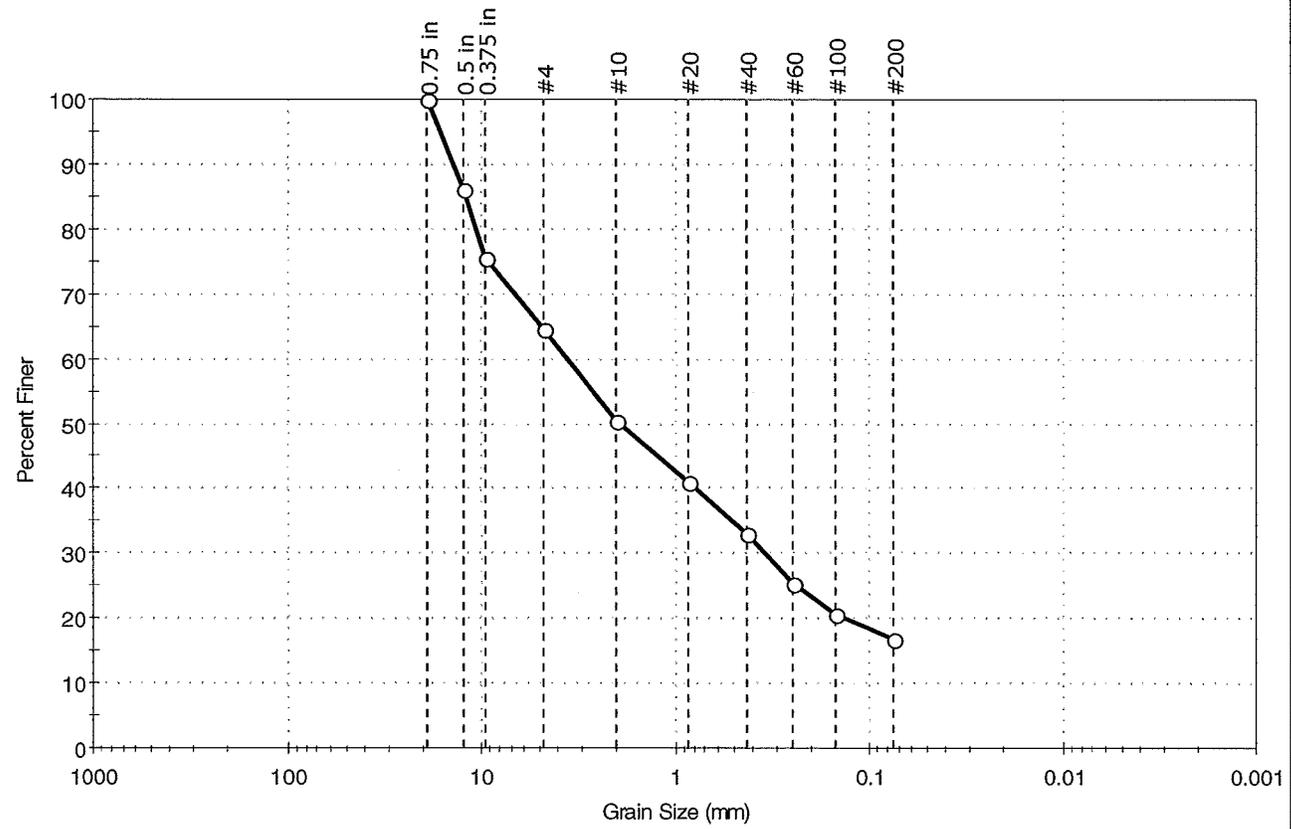
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-10	Sample Type: jar
Sample ID: S2 Fill	Test Date: 09/20/12
Depth: 2-4	Test ID: 249408
Test Comment: ---	Tested By: jbr
Sample Description: Moist, brown silty sand with gravel	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	35.5	47.8	16.7

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	76		
#4	4.75	65		
#10	2.00	50		
#20	0.85	41		
#40	0.42	33		
#60	0.25	26		
#100	0.15	21		
#200	0.075	17		

Coefficients	
D ₈₅ = 12.1130 mm	D ₃₀ = 0.3445 mm
D ₆₀ = 3.5999 mm	D ₁₅ = N/A
D ₅₀ = 1.9199 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

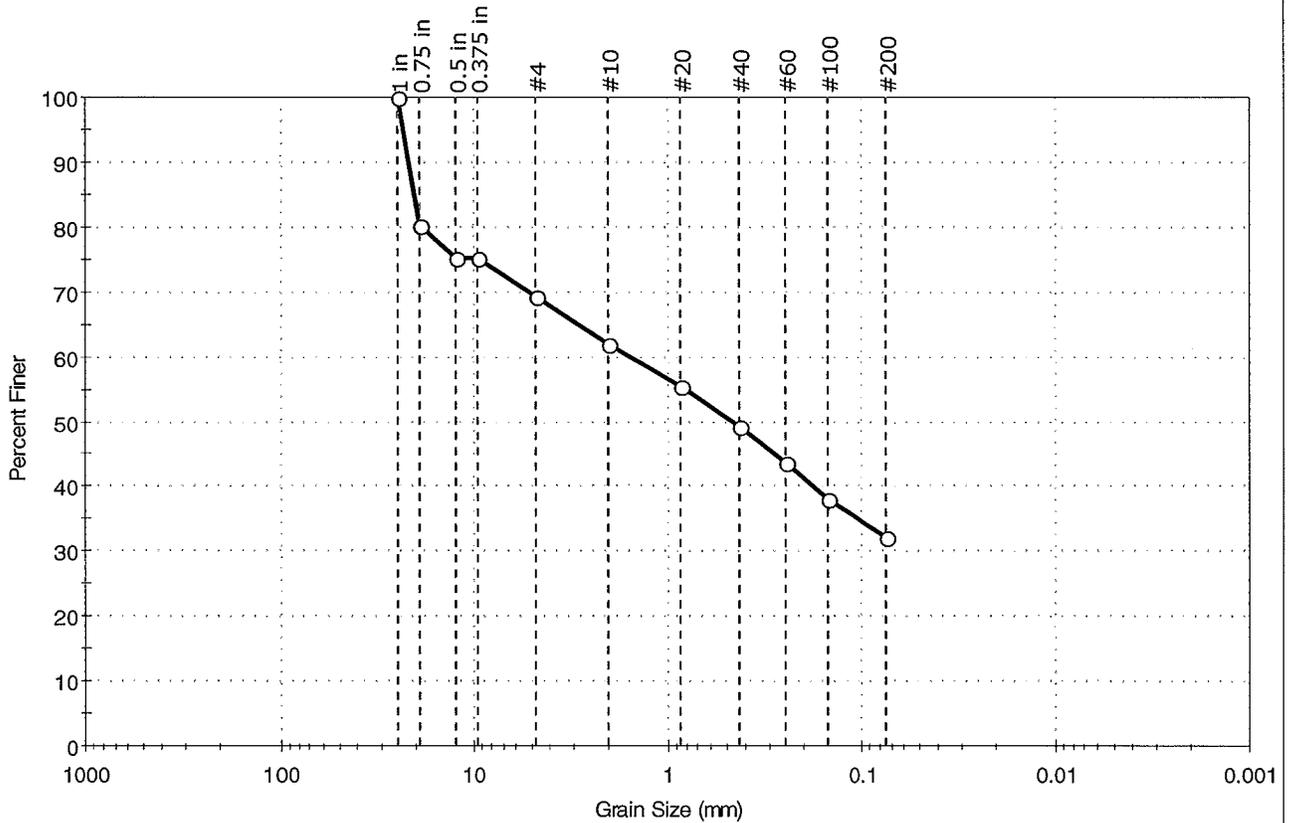
Classification	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description	
Sand/Gravel Particle Shape	: ANGULAR
Sand/Gravel Hardness	: HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-10	Sample Type: jar
Sample ID: S7 Marine Sand	Test Date: 09/21/12
Depth: 12-14	Test Id: 249409
Test Comment: ---	
Sample Description: Moist, olive brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	30.7	37.0	32.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	80		
0.5 in	12.50	75		
0.375 in	9.50	75		
#4	4.75	69		
#10	2.00	62		
#20	0.85	55		
#40	0.42	49		
#60	0.25	44		
#100	0.15	38		
#200	0.075	32		

Coefficients	
D ₈₅ = 20.3215 mm	D ₃₀ = N/A
D ₆₀ = 1.5483 mm	D ₁₅ = N/A
D ₅₀ = 0.4644 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

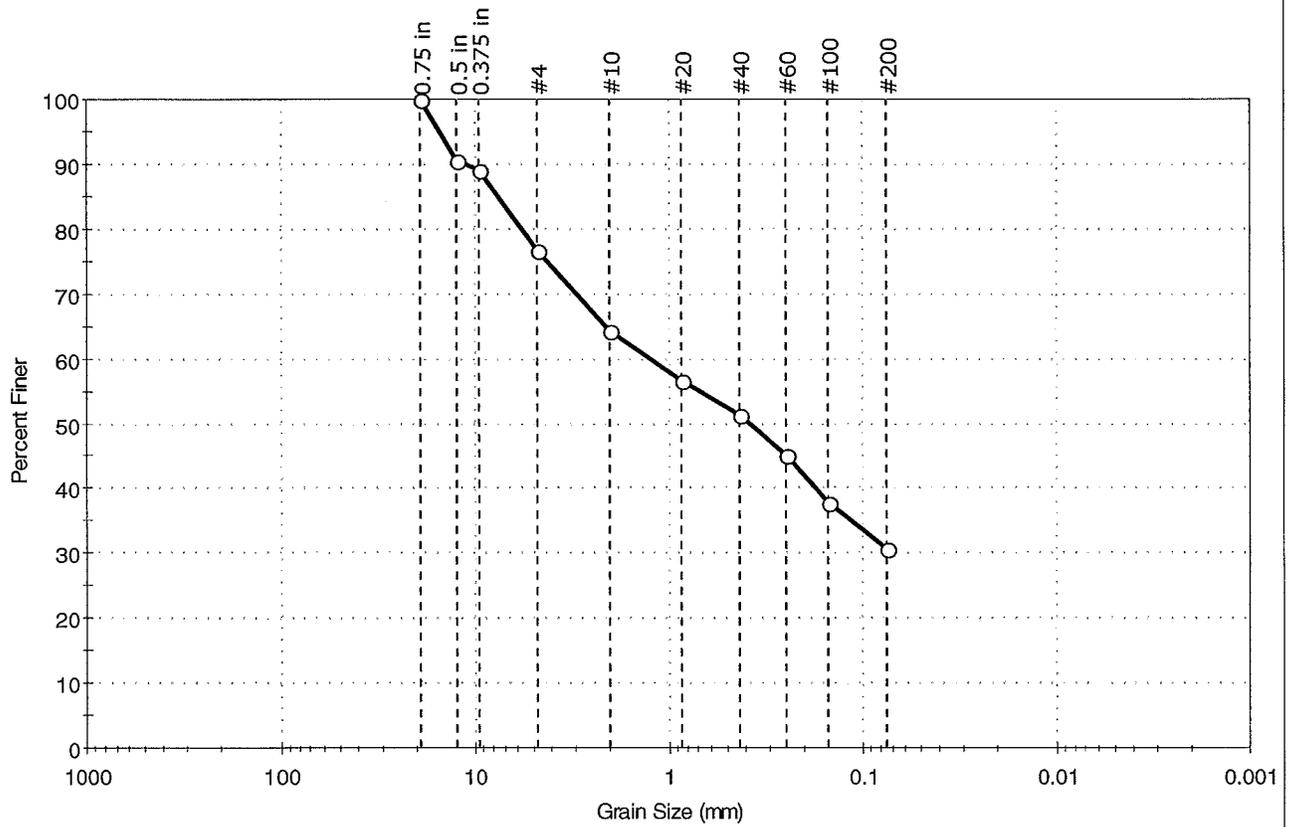
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-11	Sample Type: jar
Sample ID: S2 Fill	Test Date: 09/20/12
Depth: 2-4	Test ID: 249410
Test Comment: ---	Tested By: jbr
Sample Description: Moist, dark olive brown silty sand with gravel	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	23.4	46.0	30.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	91		
0.375 in	9.50	89		
#4	4.75	77		
#10	2.00	64		
#20	0.85	57		
#40	0.42	51		
#60	0.25	45		
#100	0.15	38		
#200	0.075	31		

Coefficients	
D ₈₅ = 7.5420 mm	D ₃₀ = N/A
D ₆₀ = 1.2378 mm	D ₁₅ = N/A
D ₅₀ = 0.3793 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

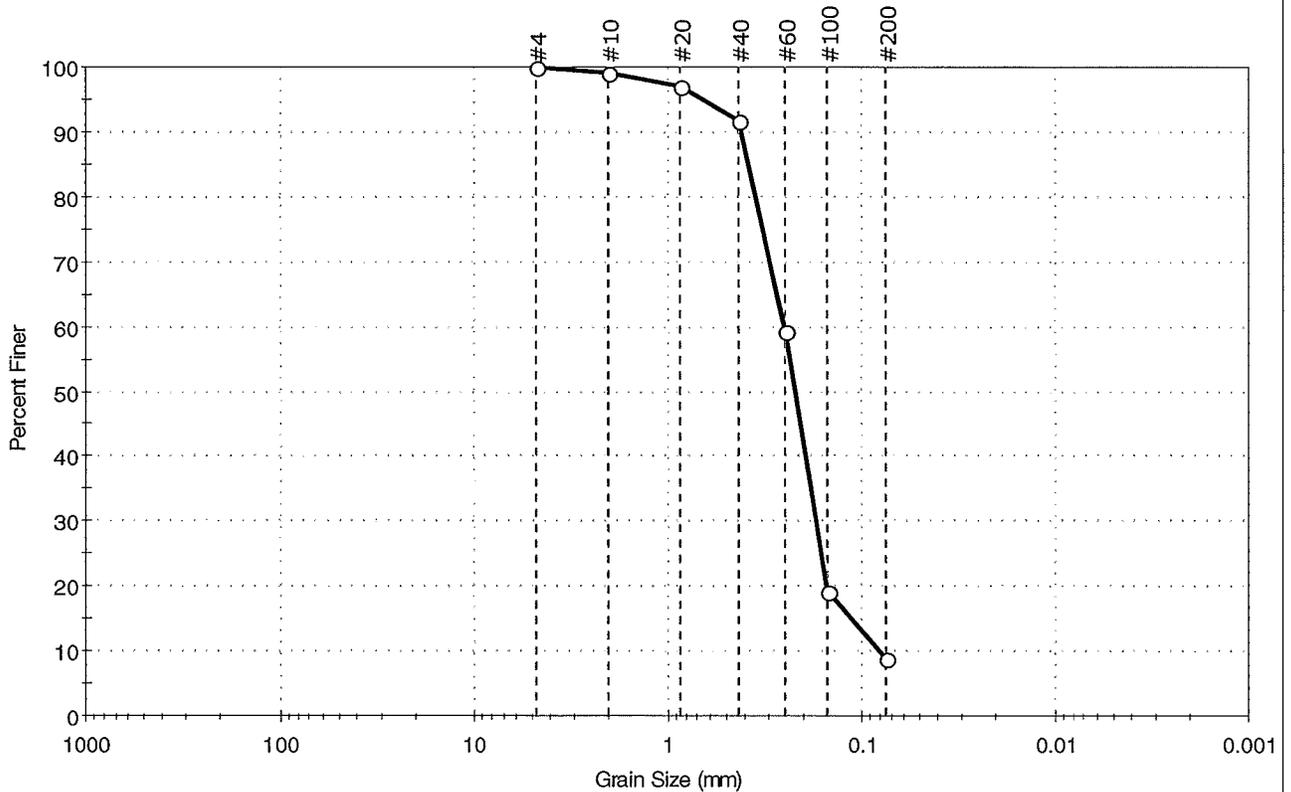
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-11	Sample Type: jar
Sample ID: S13 Marine Sand	Test Date: 09/20/12
Depth: 24-26	Test Id: 249411
Test Comment: ---	
Sample Description: Moist, dark gray sand with silt	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	--	91.2	8.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.425	92		
#60	0.25	59		
#100	0.15	19		
#200	0.075	9		

Coefficients	
D ₈₅ = 0.3801 mm	D ₃₀ = 0.1721 mm
D ₆₀ = 0.2526 mm	D ₁₅ = 0.1133 mm
D ₅₀ = 0.2219 mm	D ₁₀ = 0.0811 mm
C _u = 3.115	C _c = 1.446

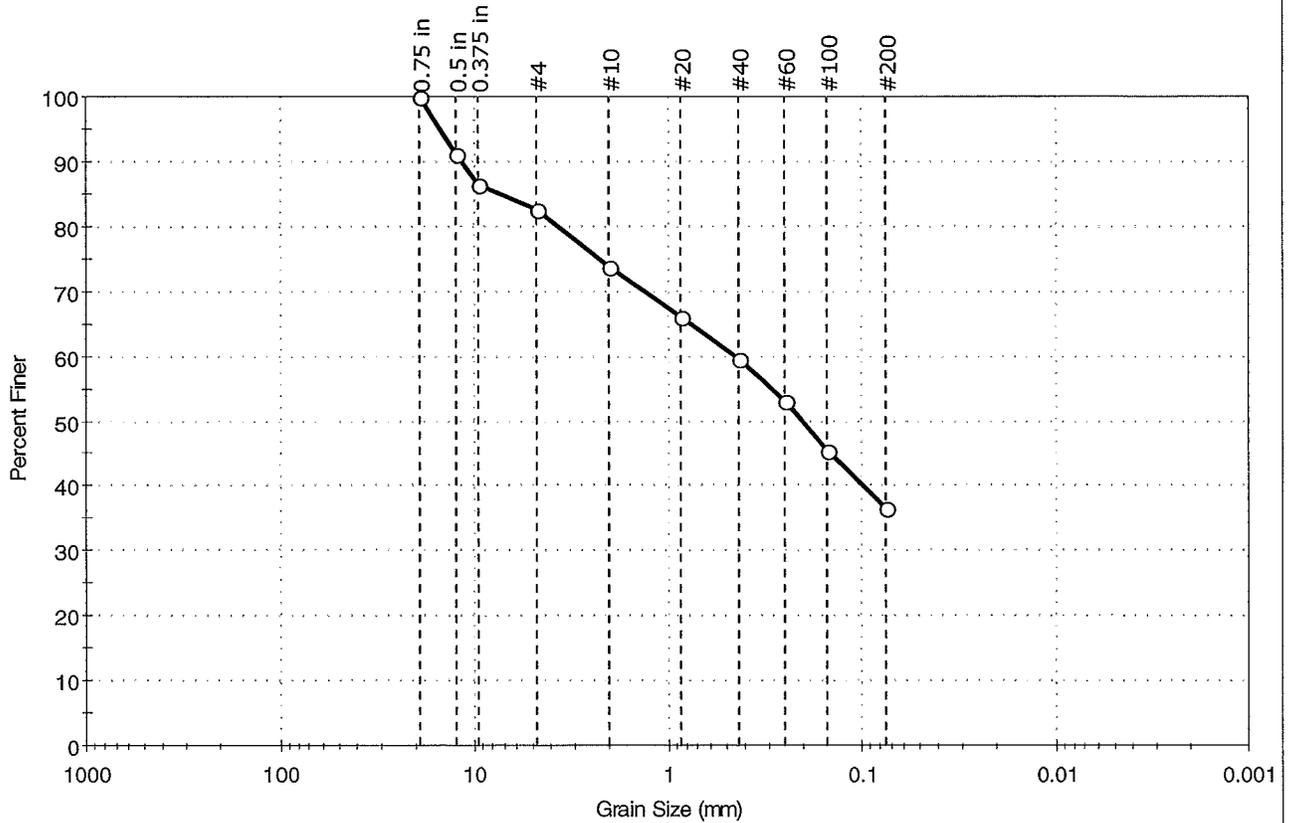
Classification	
ASTM	N/A
AASHTO	Fine Sand (A-3 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-12	Sample Type: jar
Sample ID: S6 Fill	Test Date: 09/21/12
Depth: 10-12	Test Id: 249412
Test Comment: ---	
Sample Description: Moist, olive brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	17.4	46.0	36.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	91		
0.375 in	9.50	86		
#4	4.75	83		
#10	2.00	74		
#20	0.85	66		
#40	0.42	59		
#60	0.25	53		
#100	0.15	45		
#200	0.075	37		

Coefficients	
D ₈₅ = 7.4314 mm	D ₃₀ = N/A
D ₆₀ = 0.4491 mm	D ₁₅ = N/A
D ₅₀ = 0.2029 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

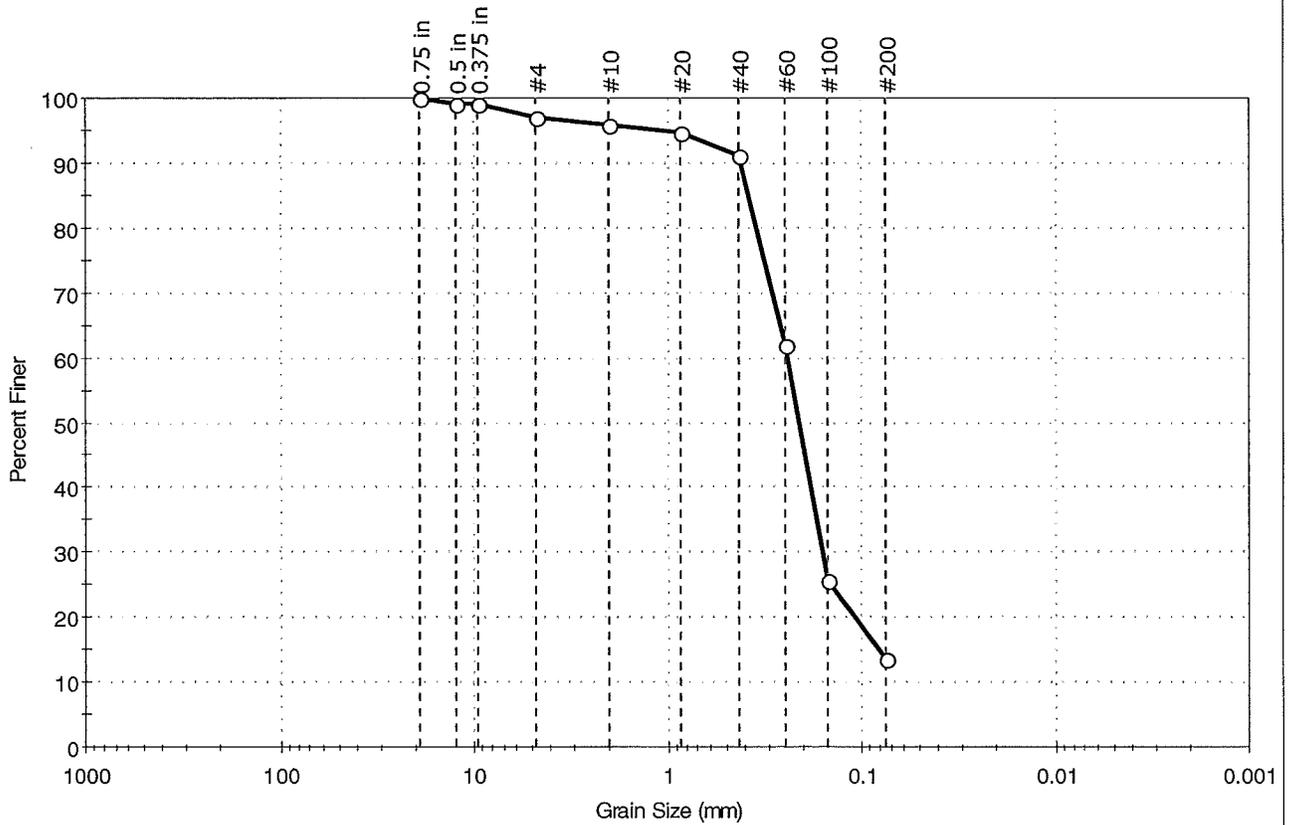
Classification	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-12	Sample Type: jar
Sample ID: S12 Marine Sand	Test Date: 09/20/12
Depth: 22-24	Test Id: 249413
Test Comment: ---	
Sample Description: Moist, dark gray silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	3.1	83.3	13.6

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	99		
#4	4.75	97		
#10	2.00	96		
#20	0.85	95		
#40	0.42	91		
#60	0.25	62		
#100	0.15	26		
#200	0.075	14		

Coefficients	
D ₈₅ = 0.3802 mm	D ₃₀ = 0.1597 mm
D ₆₀ = 0.2431 mm	D ₁₅ = 0.0812 mm
D ₅₀ = 0.2113 mm	D ₁₀ = 0.0607 mm
C _u = N/A	C _c = N/A

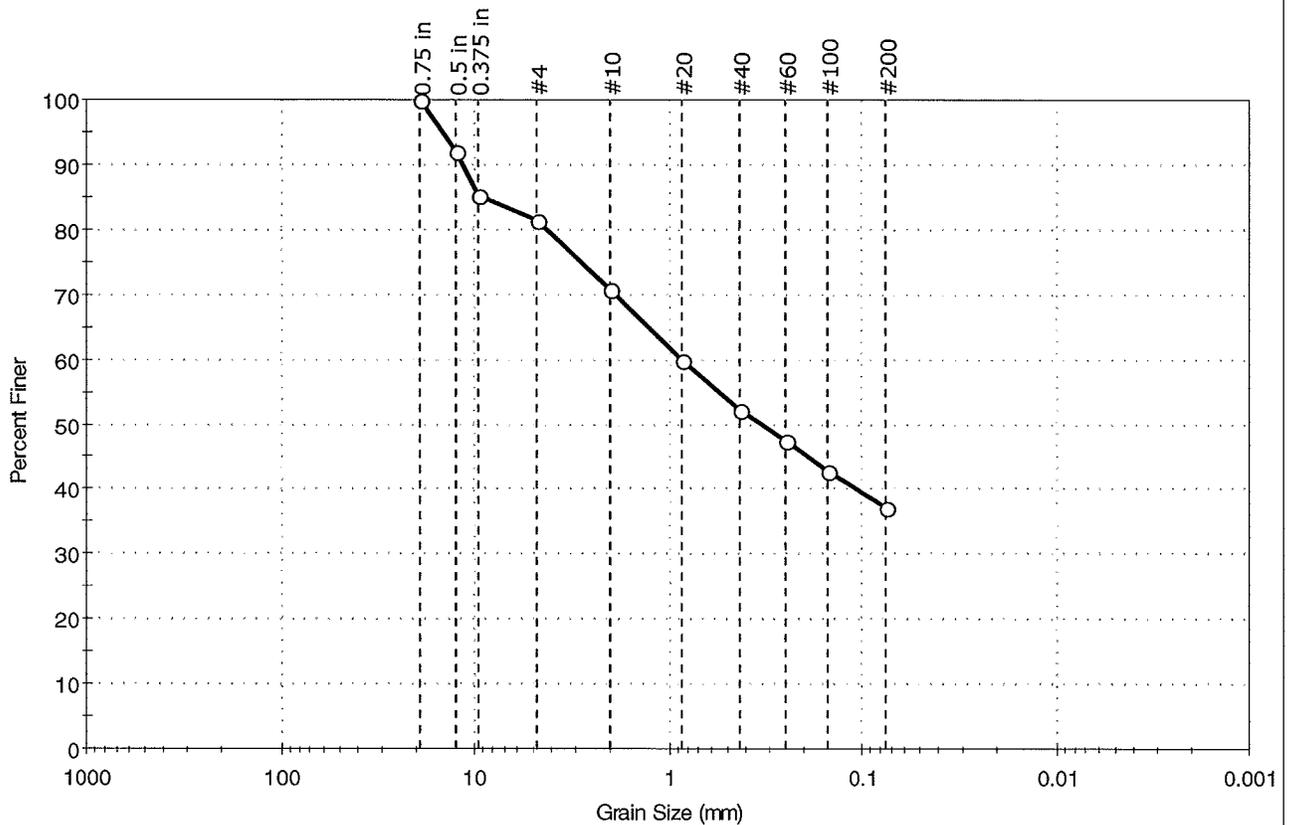
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	Tested By: jbr
Location: Newport, RI	Checked By: jdt
Boring ID: B-13	Sample Type: jar
Sample ID: S1 Fill	Test Date: 09/20/12
Depth: 0-2	Test Id: 249414
Test Comment: ---	
Sample Description: Moist, olive brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	18.6	44.3	37.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	92		
0.375 in	9.50	85		
#4	4.75	81		
#10	2.00	71		
#20	0.85	60		
#40	0.42	52		
#60	0.25	47		
#100	0.15	43		
#200	0.075	37		

Coefficients	
D ₈₅ = 8.9571 mm	D ₃₀ = N/A
D ₆₀ = 0.8660 mm	D ₁₅ = N/A
D ₅₀ = 0.3324 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

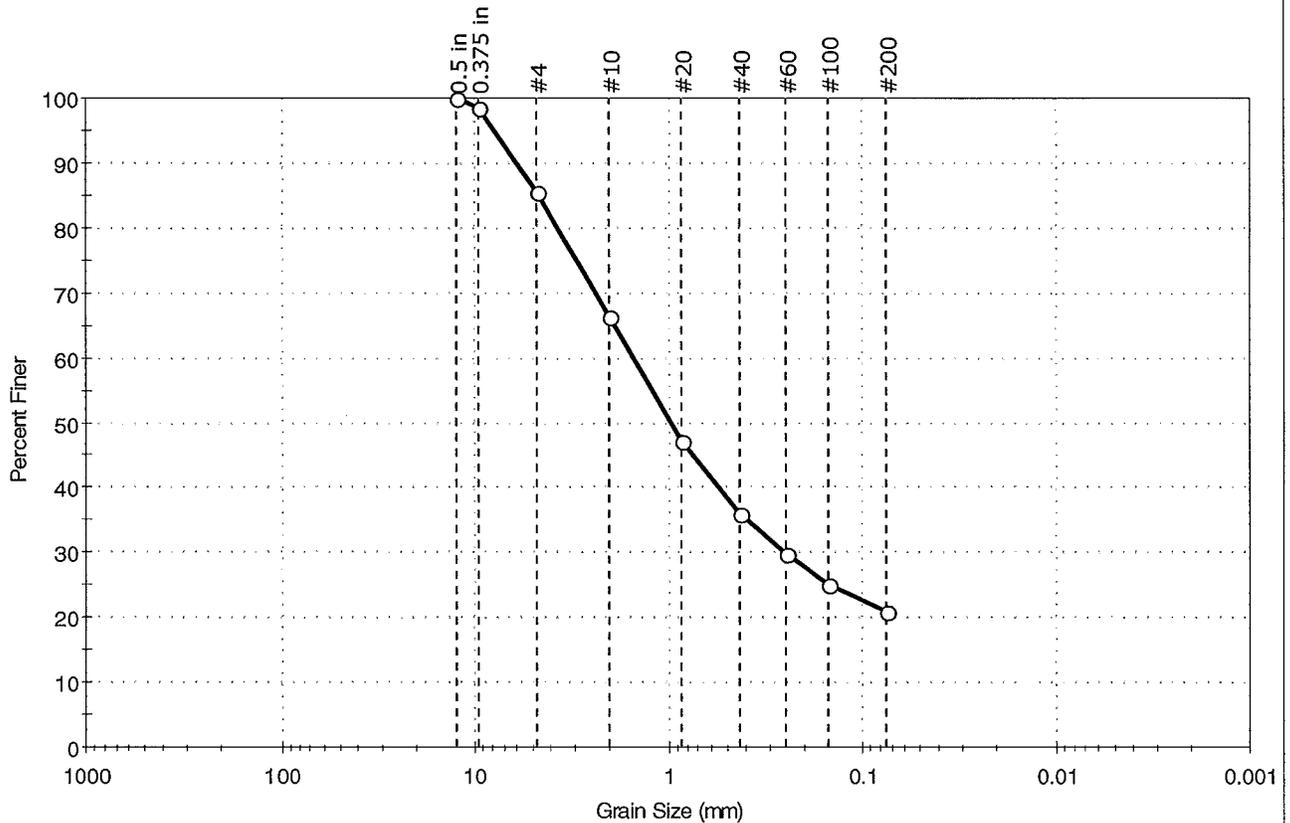
Classification	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-13	Sample Type: jar
Sample ID: S2 Weathered Rock	Tested By: jbr
Depth: 2-4	Test Date: 09/20/12
	Checked By: jdt
Test Id: 249415	
Test Comment: ---	
Sample Description: Moist, gray silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	14.6	64.6	20.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	85		
#10	2.00	67		
#20	0.85	47		
#40	0.42	36		
#60	0.25	30		
#100	0.15	25		
#200	0.075	21		

<u>Coefficients</u>	
D ₈₅ = 4.6569 mm	D ₃₀ = 0.2538 mm
D ₆₀ = 1.4988 mm	D ₁₅ = N/A
D ₅₀ = 0.9623 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

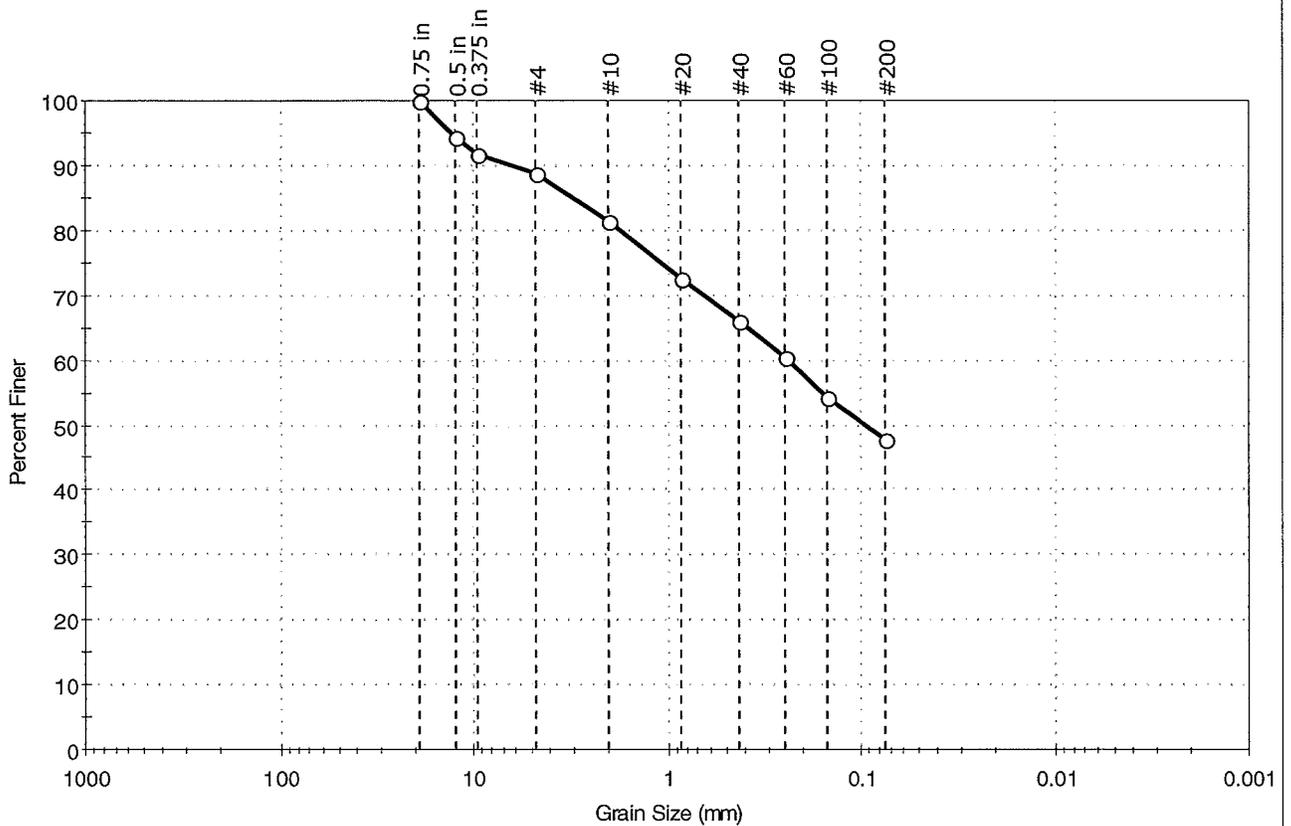
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>	
Sand/Gravel Particle Shape : ANGULAR	
Sand/Gravel Hardness : HARD	



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-14	Sample Type: jar
Sample ID: S1 Fill	Tested By: jbr
Depth: 0-2	Test Date: 09/13/12
	Checked By: jdt
Test Comment: ---	Test Id: 249416
Sample Description: Moist, olive brown silty sand	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	11.1	41.1	47.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	94		
0.375 in	9.50	92		
#4	4.75	89		
#10	2.00	81		
#20	0.85	72		
#40	0.42	66		
#60	0.25	61		
#100	0.15	54		
#200	0.075	48		

<u>Coefficients</u>	
D ₈₅ = 3.0273 mm	D ₃₀ = N/A
D ₆₀ = 0.2391 mm	D ₁₅ = N/A
D ₅₀ = 0.0947 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

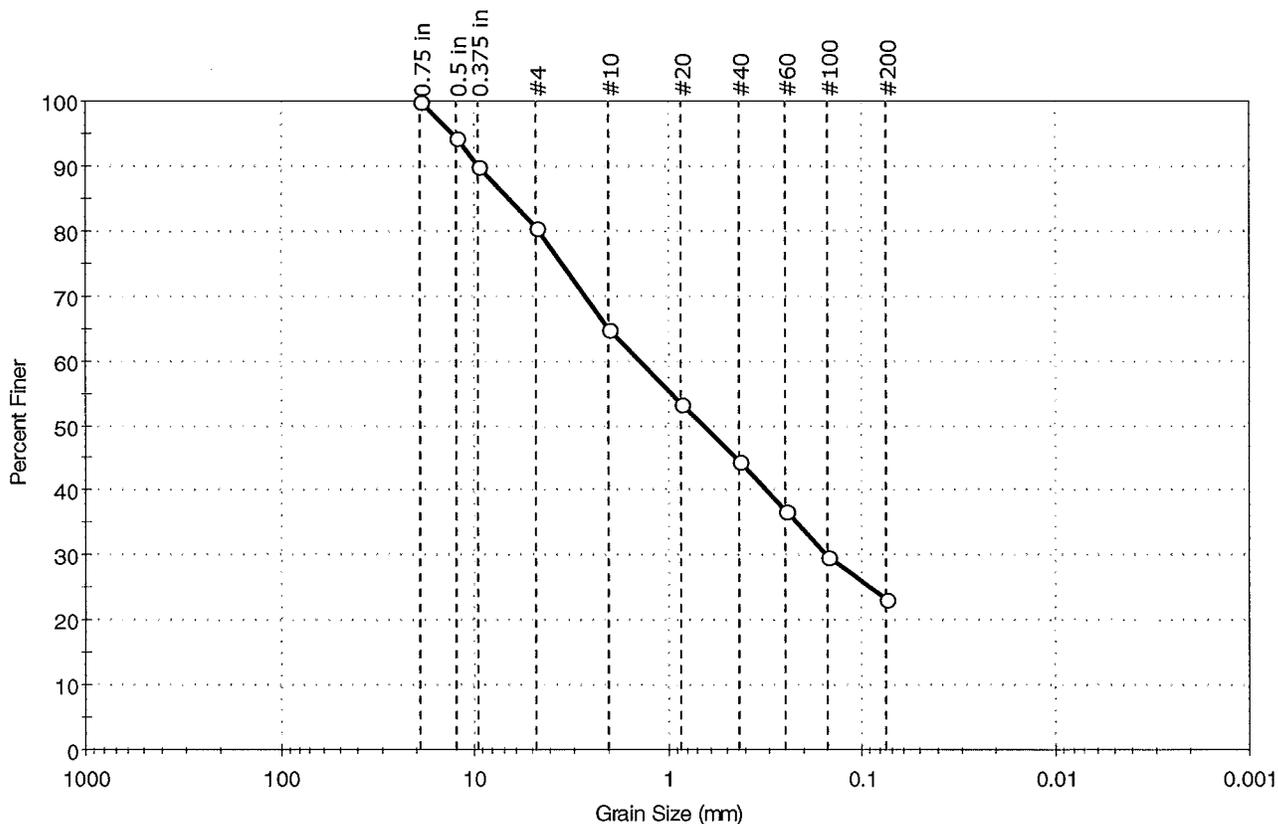
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>	
Sand/Gravel Particle Shape : ANGULAR	
Sand/Gravel Hardness : HARD	



Client: McPhail Associates	Project No: GTX-12211
Project: Naval Station Newport	
Location: Newport, RI	
Boring ID: B-14	Sample Type: jar
Sample ID: S7 Weathered Rock	Tested By: jbr
Depth: 12-14	Test Date: 09/21/12
	Checked By: jdt
Test Comment: ---	Test Id: 249417
Sample Description: Moist, olive brown silty sand with gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	19.5	57.2	23.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	94		
0.375 in	9.50	90		
#4	4.75	80		
#10	2.00	65		
#20	0.85	53		
#40	0.42	44		
#60	0.25	37		
#100	0.15	30		
#200	0.075	23		

<u>Coefficients</u>	
D ₈₅ = 6.6086 mm	D ₃₀ = 0.1537 mm
D ₆₀ = 1.3983 mm	D ₁₅ = N/A
D ₅₀ = 0.6551 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

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

<u>Sample/Test Description</u>	
Sand/Gravel Particle Shape : ANGULAR	
Sand/Gravel Hardness : HARD	



APPENDIX F

Results of Geotechnical Laboratory Testing of Rock Samples

Rock Core Photographs



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	09/14/12
Tested By:	bfm
Checked By:	mpd
Sample Type:	Core
Sample Description:	---
Strain Rate:	2.5%/min.

**Splitting Tensile Strength of Intact Rock Core Specimens
by ASTM D 3967**

Boring ID	Sample ID	Depth, ft.	Test No.	Thickness (L), in.			Diameter (D), in.	Failure Load (P), lb.	Splitting Tensile Strength, psi
B-2	RC1	25.15-25.23	ST-1	0.95	0.95	0.93	1.99	5,741	1,940
B-2	RC1	26.37-26.45	ST-2	0.90	0.90	0.90	1.99	5,202	1,840

Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211

**Splitting Tensile Strength of Intact Rock Core Specimens
by ASTM D 3967**

B-2 RC1 25.15-25.23 ft ST-1	 ST-1	 ST-1	Intact material failure L/D: 0.5
--	--	---	---

B-2 RC1 26.37-26.45 ft ST-2	 ST-2	 ST-2	Intact material failure L/D: 0.5
--	--	---	---

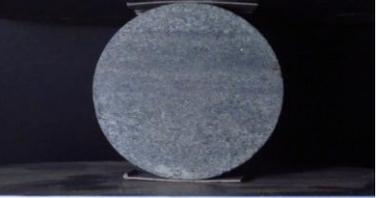
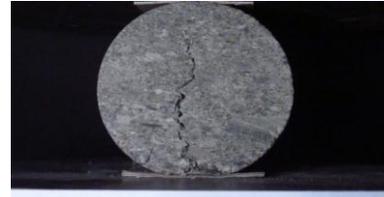


Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	09/14/12
Tested By:	bfm
Checked By:	mpd
Sample Type:	Core
Sample Description:	---
Strain Rate:	2.5%/min.

**Splitting Tensile Strength of Intact Rock Core Specimens
by ASTM D 3967**

Boring ID	Sample ID	Depth, ft.	Test No.	Thickness (L), in.			Diameter (D), in.	Failure Load (P), lb.	Splitting Tensile Strength, psi
B-14	RC1	27.75-27.83	ST-3	0.90	0.91	0.92	1.97	563	200
B-14	RC2	31.25-31.33	ST-4	0.90	0.92	0.93	1.97	609	215
B-14	RC2	32.71-32.79	ST-5	0.93	0.92	0.90	1.97	904	318
B-14	RC2	33.35-33.43	ST-6	0.93	0.92	0.92	1.97	1,235	431
B-14	RC2	34.68-34.76	ST-7	0.95	0.95	0.95	1.99	1,306	442

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D 3967

<p>B-14 RC1 27.75-27.83 ft</p> <p>ST-3</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-3</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-3</p>	<p>Discontinuity failure</p> <p style="text-align: center;">L/D: 0.5</p>
<p>B-14 RC2 31.25-31.33 ft</p> <p>ST-4</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-4</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-4</p>	<p>Discontinuity failure</p> <p style="text-align: center;">L/D: 0.5</p>
<p>B-14 RC2 32.71-32.79 ft</p> <p>ST-5</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-5</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-5</p>	<p>Intact material failure</p> <p style="text-align: center;">L/D: 0.5</p>
<p>B-14 RC2 33.35-33.43 ft</p> <p>ST-6</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-6</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-6</p>	<p>Discontinuity failure</p> <p style="text-align: center;">L/D: 0.5</p>
<p>B-14 RC2 34.68-34.76 ft</p> <p>ST-7</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-7</p>	 <p style="text-align: center; font-size: 24pt; font-weight: bold;">ST-7</p>	<p>Discontinuity failure</p> <p style="text-align: center;">L/D: 0.5</p>



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	09/13/12
Tested By:	daa
Checked By:	mpd

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D 7012 Method C

Boring ID	Sample ID	Depth, ft	Bulk Density, lb/ft ³	Compressive Strength, psi	Failure Type	In conformance with ASTM D 4543
B-2	RC1	24.40-24.77	171	9,938	1	YES
B-2	RC2	31.10-31.47	169	2,041	2	YES
B-4	RC3	33.04-33.39	168	1,462	2	NO*
B-7	RC1	16.10-16.45	161	5,071	2	NO*
B-14	RC1	25.35-25.72	163	2,014	1	YES
B-14	RC1	28.12-28.49	158	3,124	1	YES
B-14	RC2	32.13-32.50	158	1,751	1	NO*

- 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.
 - Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure (See attached photographs)
 - * The as-received core did not meet the ASTM side straightness tolerance.

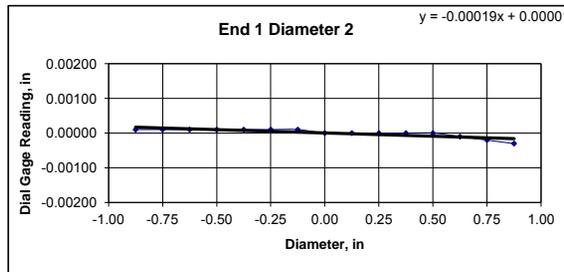
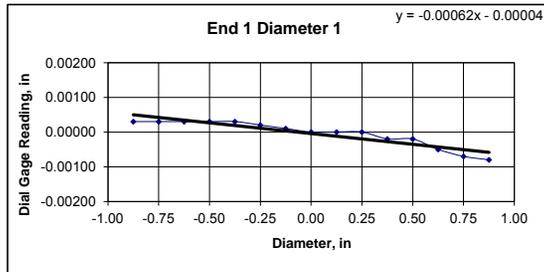


Client:	McPhail Associates	Test Date:	9/13/2012
Project Name:	Naval Station Newport	Tested By:	daa
Project Location:	Newport, RI	Checked By:	mpd
GTX #:	12211		
Boring ID:	B-2		
Sample ID:	RC1		
Depth:	24.40-24.77 ft		
Visual Description:	See photographs		

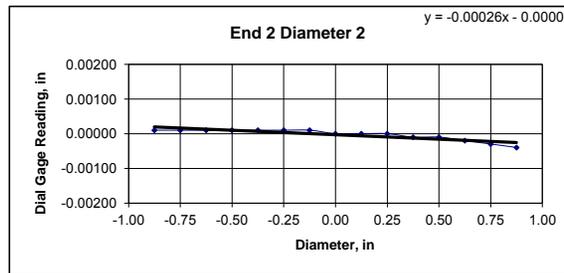
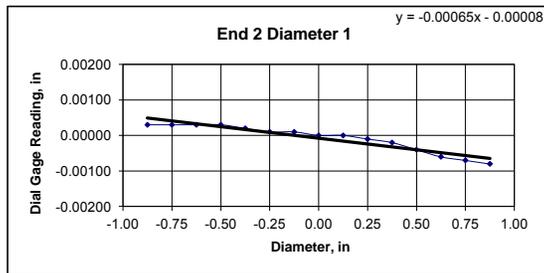
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.30	4.30	4.30	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES			
Specimen Diameter, in:	1.99	1.99	1.99				
Specimen Mass, g:	601.17						
Bulk Density, lb/ft ³ :	171						
Length to Diameter Ratio:	2.2	Length to Diameter Ratio 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	0.00030	0.00030	0.00020	0.00010	0.00000	0.00000	0.00000	-0.00020	-0.00020	-0.00050	-0.00070	-0.00080
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030
	Difference between max and min readings, in: 0° = 0.00110 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	0.00030	0.00030	0.00030	0.00030	0.00020	0.00010	0.00010	0.00000	0.00000	-0.00010	-0.00020	-0.00040	-0.00060	-0.00070	-0.00080
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030	-0.00040
	Difference between max and min readings, in: 0° = 0.0011 90° = 0.0005 Maximum difference must be < 0.0020 in. Difference = \pm 0.00055 Flatness Tolerance Met? YES														



DIAMETER 1	
End 1:	Slope of Best Fit Line: -0.00062 Angle of Best Fit Line: -0.03552
End 2:	Slope of Best Fit Line: -0.00065 Angle of Best Fit Line: -0.03724
Maximum Angular Difference:	0.00172
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	Slope of Best Fit Line: -0.00019 Angle of Best Fit Line: -0.01089
End 2:	Slope of Best Fit Line: -0.00026 Angle of Best Fit Line: -0.01490
Maximum Angular Difference:	0.00401
Parallelism Tolerance Met? Spherically Seated	YES

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?	Maximum angle of departure must be \leq 0.25°
Diameter 1, in	0.00110	1.990	0.00055	0.032	YES	Perpendicularity Tolerance Met? YES
Diameter 2, in (rotated 90°)	0.00040	1.990	0.00020	0.012	YES	
END 2						
Diameter 1, in	0.00110	1.990	0.00055	0.032	YES	
Diameter 2, in (rotated 90°)	0.00050	1.990	0.00025	0.014	YES	

Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-2
Sample ID:	RC1
Depth, ft:	24.40-24.77



After cutting and grinding



After break



Client:	McPhail Associates	Test Date:	9/13/2012
Project Name:	Naval Station Newport	Tested By:	daa
Project Location:	Newport, RI	Checked By:	mpd
GTX #:	12211		
Boring ID:	B-2		
Sample ID:	RC2		
Depth:	31.10-31.47 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.28	4.28	4.28	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES			
Specimen Diameter, in:	1.99	1.99	1.99				
Specimen Mass, g:	592.76						
Bulk Density, lb/ft ³ :	169						
Length to Diameter Ratio:	2.2	Length to Diameter Ratio 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	-0.00080	-0.00080	-0.00060	-0.00050	-0.00030	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00030	0.00030	0.00040	0.00040	0.00040
Diameter 2, in (rotated 90°)	-0.00040	-0.00040	-0.00030	-0.00020	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00010
	Difference between max and min readings, in: 0° = 0.00120 90° = 0.00050														
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	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00010	0.00020	0.00030	0.00030	0.00040	0.00040	0.00050
Diameter 2, in (rotated 90°)	-0.00030	-0.00030	-0.00020	-0.00020	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00020	0.00020	0.00020	0.00020
	Difference between max and min readings, in: 0° = 0.0013 90° = 0.0005 Maximum difference must be < 0.0020 in. Difference = \pm 0.00065 Flatness Tolerance Met? YES														

	<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: 0.00075 Angle of Best Fit Line: 0.04297</p> <p>End 2: Slope of Best Fit Line: 0.00074 Angle of Best Fit Line: 0.04240</p> <p>Maximum Angular Difference: 0.00057</p> <p align="right">Parallelism Tolerance Met? YES Spherically Seated</p> <hr/> <p>DIAMETER 2</p> <p>End 1: Slope of Best Fit Line: 0.00031 Angle of Best Fit Line: 0.01776</p> <p>End 2: Slope of Best Fit Line: 0.00031 Angle of Best Fit Line: 0.01776</p> <p>Maximum Angular Difference: 0.00000</p> <p align="right">Parallelism Tolerance Met? YES Spherically Seated</p>
--	---

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	0.00120	1.990	0.00060	0.035	YES
Diameter 2, in (rotated 90°)	0.00050	1.990	0.00025	0.014	YES
END 2					
Diameter 1, in	0.00130	1.990	0.00065	0.037	YES
Diameter 2, in (rotated 90°)	0.00050	1.990	0.00025	0.014	YES
	Perpendicularity Tolerance Met? YES				



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-2
Sample ID:	RC2
Depth, ft:	31.10-31.47



After cutting and grinding



After break

Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-4
Sample ID:	RC3
Depth, ft:	33.04-33.39



After cutting and grinding



After break



Client:	McPhail Associates	Test Date:	9/13/2012
Project Name:	Naval Station Newport	Tested By:	daa
Project Location:	Newport, RI	Checked By:	mpd
GTX #:	12211		
Boring ID:	B-7		
Sample ID:	RC1		
Depth:	16.10-16.45 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? NO			
Specimen Length, in:	4.00	4.01	4.01	Maximum difference must be < 0.020 in.			
Specimen Diameter, in:	1.98	1.99	1.99	Straightness Tolerance Met? NO			
Specimen Mass, g:	525.57						
Bulk Density, lb/ft ³ :	161						
Length to Diameter Ratio:	2.0	Length to Diameter Ratio 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	-0.00060	-0.00060	-0.00060	-0.00040	-0.00030	-0.00010	-0.00010	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	0.00000	0.00000	-0.00010	-0.00010	-0.00020	
	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	-0.00050	-0.00040	-0.00040	-0.00030	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00010	0.00020	0.00020	0.00030	0.00030
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	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° = 0.0008 90° = 0.0001 Maximum difference must be < 0.0020 in. Difference = \pm 0.00040														
	Flatness Tolerance Met? YES														

	<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: 0.00045 Angle of Best Fit Line: 0.02578</p> <p>End 2: Slope of Best Fit Line: 0.00045 Angle of Best Fit Line: 0.02578</p> <p>Maximum Angular Difference: 0.00000</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>
	<p>DIAMETER 2</p> <p>End 1: Slope of Best Fit Line: -0.00007 Angle of Best Fit Line: -0.00401</p> <p>End 2: Slope of Best Fit Line: -0.00008 Angle of Best Fit Line: -0.00458</p> <p>Maximum Angular Difference: 0.00057</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>

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
	Perpendicularity Tolerance Met? 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

Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-7
Sample ID:	RC1
Depth, ft:	16.10-16.45



After cutting and grinding



After break



Client:	McPhail Associates	Test Date:	9/13/2012
Project Name:	Naval Station Newport	Tested By:	daa
Project Location:	Newport, RI	Checked By:	mpd
GTX #:	12211		
Boring ID:	B-14		
Sample ID:	RC1		
Depth:	25.35-25.72 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.27	4.28	4.28	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES			
Specimen Diameter, in:	1.97	1.97	1.97				
Specimen Mass, g:	558.97						
Bulk Density, lb/ft ³ :	163						
Length to Diameter Ratio:	2.2	Length to Diameter Ratio 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	-0.00060	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00020	0.00040	0.00030	0.00040
Diameter 2, in (rotated 90°)	-0.00090	-0.00050	-0.00050	-0.00050	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00010	0.00020	0.00020	0.00020
	Difference between max and min readings, in:														
	0° = 0.00110											90° = 0.00110			
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	-0.00090	-0.00090	-0.00070	-0.00070	-0.00060	-0.00020	-0.00010	0.00000	0.00000	0.00000	-0.00010	0.00010	0.00010	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00090	-0.00080	-0.00070	-0.00050	-0.00040	-0.00050	-0.00020	0.00000	0.00010	0.00010	0.00020	0.00010	0.00010	-0.00030	0.00000
	Difference between max and min readings, in:														
	0° = 0.001											90° = 0.0011			
	Maximum difference must be < 0.0020 in. Difference = \pm 0.00055														
	Flatness Tolerance Met? YES														

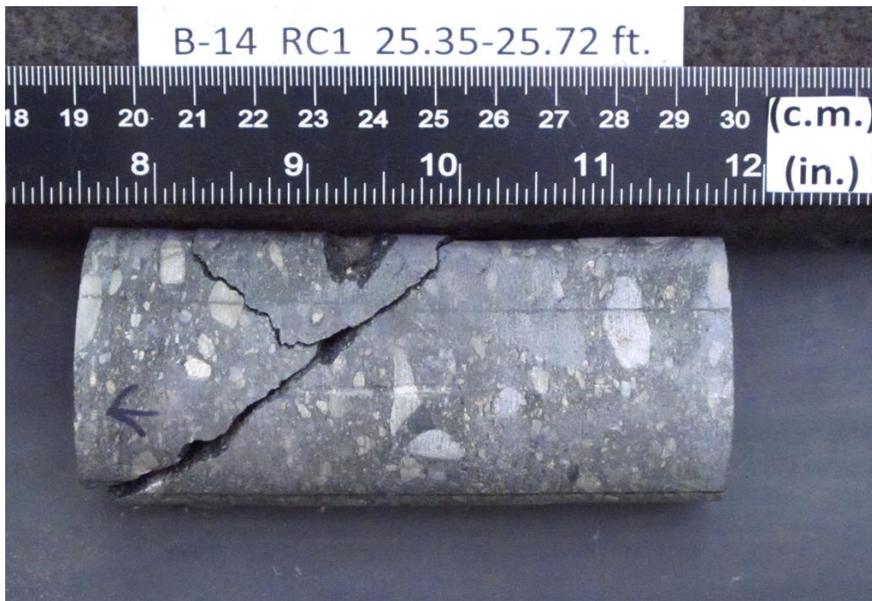
		<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: 0.00067 Angle of Best Fit Line: 0.03839</p> <p>End 2: Slope of Best Fit Line: 0.00060 Angle of Best Fit Line: 0.03438</p> <p>Maximum Angular Difference: 0.00401</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>

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	0.00110	1.970	0.00056	0.032	YES		
Diameter 2, in (rotated 90°)	0.00110	1.970	0.00056	0.032	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00100	1.970	0.00051	0.029	YES		
Diameter 2, in (rotated 90°)	0.00110	1.970	0.00056	0.032	YES		

Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-14
Sample ID:	RC1
Depth, ft:	25.35-25.72



After cutting and grinding



After break



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-14
Sample ID:	RC1
Depth, ft:	28.12-28.49



After cutting and grinding



After break



Client:	McPhail Associates	Test Date:	9/13/2012
Project Name:	Naval Station Newport	Tested By:	daa
Project Location:	Newport, RI	Checked By:	mpd
GTX #:	12211		
Boring ID:	B-14		
Sample ID:	RC2		
Depth:	32.13-32.50 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? NO			
Specimen Length, in:	4.27	4.27	4.27	Maximum difference must be < 0.020 in. Straightness Tolerance Met? NO			
Specimen Diameter, in:	1.97	1.98	1.98				
Specimen Mass, g:	545.13						
Bulk Density, lb/ft ³ :	158						
Length to Diameter Ratio:	2.2	Length to Diameter Ratio 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	0.00020	0.00020	0.00050	0.00000	0.00010	0.00020	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00040	-0.00050	-0.00080	-0.00090
Diameter 2, in (rotated 90°)	-0.00090	-0.00080	-0.00090	-0.00060	-0.00030	-0.00020	0.00000	0.00000	0.00030	0.00030	0.00030	0.00060	0.00070	0.00050	0.00100
	Difference between max and min readings, in: 0° = 0.00140 90° = 0.00190														
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	0.00020	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00060	-0.00080	-0.00090
Diameter 2, in (rotated 90°)	-0.00130	-0.00120	-0.00100	-0.00090	-0.00060	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00030	0.00040	0.00040	0.00050
	Difference between max and min readings, in: 0° = 0.0011 90° = 0.0018 Maximum difference must be < 0.0020 in. Difference = \pm 0.00095 Flatness Tolerance Met? YES														

	<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: -0.00062 Angle of Best Fit Line: -0.03552</p> <p>End 2: Slope of Best Fit Line: -0.00059 Angle of Best Fit Line: -0.03380</p> <p>Maximum Angular Difference: 0.00172</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p> <hr/> <p>DIAMETER 2</p> <p>End 1: Slope of Best Fit Line: 0.00106 Angle of Best Fit Line: 0.06073</p> <p>End 2: Slope of Best Fit Line: 0.00105 Angle of Best Fit Line: 0.06016</p> <p>Maximum Angular Difference: 0.00057</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>
--	---

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	0.00140	1.975	0.00071	0.041	YES		
Diameter 2, in (rotated 90°)	0.00190	1.975	0.00096	0.055	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00110	1.975	0.00056	0.032	YES		
Diameter 2, in (rotated 90°)	0.00180	1.975	0.00091	0.052	YES		



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	9/13/2012
Tested By:	daa
Checked By:	mpd
Boring ID:	B-14
Sample ID:	RC2
Depth, ft:	32.13-32.50



After cutting and grinding



After break



APPENDIX G

Laboratory Chemical Testing Data - Soil



ANALYTICAL REPORT

Lab Number:	L1215635
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	NAVAL STATION NEWPORT
Project Number:	5441.2.00
Report Date:	09/07/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1215635-01	TP-1 (BISHOP ROCK) FILL	NEWPORT, RI	08/30/12 11:00
L1215635-02	TP-2 (PF NORTH) FILL	NEWPORT, RI	08/30/12 11:00
L1215635-03	TP-3 (PF SOUTH) FILL	NEWPORT, RI	08/30/12 11:00
L1215635-04	TP-4 (CODDINGTON) FILL	NEWPORT, RI	08/30/12 11:00
L1215635-05	TP-5 (NAVY LODGE) FILL	NEWPORT, RI	08/30/12 11:00
L1215635-06	TP-6 (DERECKTORS) FILL	NEWPORT, RI	08/30/12 11:00

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Michelle M. Morris

Title: Technical Director/Representative

Date: 09/07/12

ORGANICS

VOLATILES

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-01
Client ID: TP-1 (BISHOP ROCK) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 09/05/12 09:40
Analyst: MM
Percent Solids: 90%
TCLP/SPLP Ext. Date: 09/04/12 15:05

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	97		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-02
Client ID: TP-2 (PF NORTH) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 09/05/12 10:13
Analyst: MM
Percent Solids: 90%
TCLP/SPLP Ext. Date: 09/04/12 15:05

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	99		70-130

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-03
 Client ID: TP-3 (PF SOUTH) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Analytical Method: 1,8260C
 Analytical Date: 09/05/12 10:46
 Analyst: MM
 Percent Solids: 94%
 TCLP/SPLP Ext. Date: 09/04/12 15:05

Date Collected: 08/30/12 11:00
 Date Received: 08/31/12
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	106		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-04

Date Collected: 08/30/12 11:00

Client ID: TP-4 (CODDINGTON) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Analytical Method: 1,8260C

Analytical Date: 09/05/12 11:19

Analyst: MM

Percent Solids: 92%

TCLP/SPLP Ext. 09/04/12 15:05

Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	89		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	103		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-05

Date Collected: 08/30/12 11:00

Client ID: TP-5 (NAVY LODGE) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Analytical Method: 1,8260C

Analytical Date: 09/05/12 11:52

Analyst: MM

Percent Solids: 92%

TCLP/SPLP Ext. 09/04/12 15:05

Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	106		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-06
Client ID: TP-6 (DERECKTORS) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 09/05/12 12:25
Analyst: MM
Percent Solids: 91%
TCLP/SPLP Ext. Date: 09/04/12 15:05

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	104		70-130

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C
Analytical Date: 09/05/12 08:01
Analyst: MM
TCLP Extraction Date: 09/04/12 15:05

Extraction Date: 09/04/12 15:05

Parameter	Result	Qualifier	Units	RL	MDL
TCLP Volatiles by EPA 1311 - Westborough Lab for sample(s): 01-06 Batch: WG558989-3					
Chloroform	ND		ug/l	7.5	--
Carbon tetrachloride	ND		ug/l	5.0	--
Tetrachloroethene	ND		ug/l	5.0	--
Chlorobenzene	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	5.0	--
Benzene	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	10	--
1,1-Dichloroethene	ND		ug/l	5.0	--
Trichloroethene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	25	--
2-Butanone	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	96		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
TCLP Volatiles by EPA 1311 - Westborough Lab Associated sample(s): 01-06 Batch: WG558989-1 WG558989-2								
Chloroform	97		99		70-130	2		20
Carbon tetrachloride	102		100		63-132	2		20
Tetrachloroethene	97		94		70-130	3		20
Chlorobenzene	93		93		75-130	0		25
1,2-Dichloroethane	101		101		70-130	0		20
Benzene	94		95		70-130	1		25
Vinyl chloride	105		104		55-140	1		20
1,1-Dichloroethene	111		110		61-145	1		25
Trichloroethene	97		96		70-130	1		25
1,4-Dichlorobenzene	88		89		70-130	1		20
2-Butanone	88		87		63-138	1		20

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
1,2-Dichloroethane-d4	103		104		70-130
Toluene-d8	97		98		70-130
4-Bromofluorobenzene	98		98		70-130
Dibromofluoromethane	109		104		70-130



SEMIVOLATILES

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-01
Client ID: TP-1 (BISHOP ROCK) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 09/05/12 20:04
Analyst: JB
Percent Solids: 90%
TCLP/SPLP Ext. Date: 09/04/12 14:57

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	82		21-120
Phenol-d6	70		10-120
Nitrobenzene-d5	77		23-120
2-Fluorobiphenyl	87		15-120
2,4,6-Tribromophenol	110		10-120
4-Terphenyl-d14	109		33-120

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-02
Client ID: TP-2 (PF NORTH) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 09/05/12 20:27
Analyst: JB
Percent Solids: 90%
TCLP/SPLP Ext. Date: 09/04/12 14:57

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	79		21-120
Phenol-d6	72		10-120
Nitrobenzene-d5	77		23-120
2-Fluorobiphenyl	86		15-120
2,4,6-Tribromophenol	109		10-120
4-Terphenyl-d14	107		33-120

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-03
Client ID: TP-3 (PF SOUTH) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 09/05/12 20:50
Analyst: JB
Percent Solids: 94%
TCLP/SPLP Ext. Date: 09/04/12 14:57

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	88		21-120
Phenol-d6	77		10-120
Nitrobenzene-d5	84		23-120
2-Fluorobiphenyl	92		15-120
2,4,6-Tribromophenol	113		10-120
4-Terphenyl-d14	113		33-120

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-04
Client ID: TP-4 (CODDINGTON) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 09/05/12 21:14
Analyst: JB
Percent Solids: 92%
TCLP/SPLP Ext. Date: 09/04/12 14:57

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	70		21-120
Phenol-d6	61		10-120
Nitrobenzene-d5	69		23-120
2-Fluorobiphenyl	79		15-120
2,4,6-Tribromophenol	105		10-120
4-Terphenyl-d14	104		33-120

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-05
 Client ID: TP-5 (NAVY LODGE) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Analytical Method: 1,8270D
 Analytical Date: 09/05/12 21:37
 Analyst: JB
 Percent Solids: 92%
 TCLP/SPLP Ext. Date: 09/04/12 14:57

Date Collected: 08/30/12 11:00
 Date Received: 08/31/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	73		21-120
Phenol-d6	65		10-120
Nitrobenzene-d5	71		23-120
2-Fluorobiphenyl	78		15-120
2,4,6-Tribromophenol	97		10-120
4-Terphenyl-d14	96		33-120

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-06
Client ID: TP-6 (DERECKTORS) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 09/05/12 22:00
Analyst: JB
Percent Solids: 91%
TCLP/SPLP Ext. Date: 09/04/12 14:57

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	73		21-120
Phenol-d6	63		10-120
Nitrobenzene-d5	72		23-120
2-Fluorobiphenyl	82		15-120
2,4,6-Tribromophenol	103		10-120
4-Terphenyl-d14	108		33-120

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
Analytical Date: 09/05/12 18:32
Analyst: JB
TCLP Extraction Date: 08/31/12 13:47

Extraction Method: EPA 3510C
Extraction Date: 09/05/12 08:05

Parameter	Result	Qualifier	Units	RL	MDL
TCLP Semivolatiles by EPA 1311 - Westborough Lab for sample(s): 01-06 Batch: WG558759-1					
Hexachlorobenzene	ND		ug/l	10	--
2,4-Dinitrotoluene	ND		ug/l	25	--
Hexachlorobutadiene	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	10	--
Nitrobenzene	ND		ug/l	10	--
2,4,6-Trichlorophenol	ND		ug/l	25	--
Pentachlorophenol	ND		ug/l	50	--
2-Methylphenol	ND		ug/l	25	--
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--
2,4,5-Trichlorophenol	ND		ug/l	25	--
Pyridine	ND		ug/l	25	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	80		21-120
Phenol-d6	71		10-120
Nitrobenzene-d5	76		23-120
2-Fluorobiphenyl	83		15-120
2,4,6-Tribromophenol	112		10-120
4-Terphenyl-d14	117		33-120

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Semivolatiles by EPA 1311 - Westborough Lab Associated sample(s): 01-06 Batch: WG558759-2 WG558759-3								
Hexachlorobenzene	113		104		40-140	8		30
2,4-Dinitrotoluene	120	Q	112	Q	24-96	7		30
Hexachlorobutadiene	94		93		40-140	1		30
Hexachloroethane	78		77		40-140	1		30
Nitrobenzene	86		84		40-140	2		30
2,4,6-Trichlorophenol	120		114		30-130	5		30
Pentachlorophenol	107	Q	96		9-103	11		30
2-Methylphenol	90		90		30-130	0		30
3-Methylphenol/4-Methylphenol	95		94		30-130	1		30
2,4,5-Trichlorophenol	121		114		30-130	6		30
Pyridine	38		39		10-66	3		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	87		89		21-120
Phenol-d6	83		85		10-120
Nitrobenzene-d5	89		89		23-120
2-Fluorobiphenyl	97		97		15-120
2,4,6-Tribromophenol	125	Q	116		10-120
4-Terphenyl-d14	111		105		33-120

PETROLEUM HYDROCARBONS

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-01

Date Collected: 08/30/12 11:00

Client ID: TP-1 (BISHOP ROCK) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Extraction Method: EPA 3546

Analytical Method: 1,8015C(M)

Extraction Date: 09/01/12 06:55

Analytical Date: 09/04/12 18:21

Analyst: AR

Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	44600		ug/kg	35800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	76		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-02

Date Collected: 08/30/12 11:00

Client ID: TP-2 (PF NORTH) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Extraction Method: EPA 3546

Analytical Method: 1,8015C(M)

Extraction Date: 09/01/12 06:55

Analytical Date: 09/04/12 17:19

Analyst: AR

Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	63300		ug/kg	35100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	76		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-03

Date Collected: 08/30/12 11:00

Client ID: TP-3 (PF SOUTH) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Extraction Method: EPA 3546

Analytical Method: 1,8015C(M)

Extraction Date: 09/01/12 06:55

Analytical Date: 09/04/12 19:24

Analyst: AR

Percent Solids: 94%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	35300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	52		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-04

Date Collected: 08/30/12 11:00

Client ID: TP-4 (CODDINGTON) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Extraction Method: EPA 3546

Analytical Method: 1,8015C(M)

Extraction Date: 09/01/12 06:55

Analytical Date: 09/04/12 18:53

Analyst: AR

Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	48700		ug/kg	35800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	80		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-05

Date Collected: 08/30/12 11:00

Client ID: TP-5 (NAVY LODGE) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

Extraction Method: EPA 3546

Analytical Method: 1,8015C(M)

Extraction Date: 09/01/12 06:55

Analytical Date: 09/04/12 16:16

Analyst: AR

Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	82000		ug/kg	35800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	60		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-06
Client ID: TP-6 (DERECKTORS) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8015C(M)
Analytical Date: 09/04/12 16:48
Analyst: AR
Percent Solids: 91%

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 09/01/12 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	73700		ug/kg	35000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	74		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8015C(M)
 Analytical Date: 09/04/12 10:43
 Analyst: AR

Extraction Method: EPA 3546
 Extraction Date: 09/01/12 06:55

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-06 Batch: WG558405-1					
TPH	ND		ug/kg	32500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	70		40-140

Lab Control Sample Analysis Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-06 Batch: WG558405-2								
TPH	72		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	69				40-140

Lab Duplicate Analysis
Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1215635

Report Date: 09/07/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG558405-3 QC Sample: L1215583-03 Client ID: DUP Sample						
TPH	187000	179000	ug/kg	4		40

Surrogate	%Recovery Qualifier	%Recovery Qualifier	Acceptance Criteria
o-Terphenyl	55	68	40-140

METALS

Project Name: NAVAL STATION NEWPORT

Lab Number: L1215635

Project Number: 5441.2.00

Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-01

Date Collected: 08/30/12 11:00

Client ID: TP-1 (BISHOP ROCK) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

TCLP/SPLP Ext. Date: 09/04/12 14:57

Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
-----------	--------	-----------	-------	----	-----	-----------------	---------------	---------------	-------------	-------------------	---------

TCLP Metals by EPA 1311 - Westborough Lab

Arsenic, TCLP	ND		mg/l	1.0	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM
Lead, TCLP	9.0		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:49	EPA 7470A	1,7470A	KL
Selenium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:45	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-02
 Client ID: TP-2 (PF NORTH) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Percent Solids: 90%

Date Collected: 08/30/12 11:00
 Date Received: 08/31/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/04/12 14:57

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:51	EPA 7470A	1,7470A	KL
Selenium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:48	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT

Lab Number: L1215635

Project Number: 5441.2.00

Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-03

Date Collected: 08/30/12 11:00

Client ID: TP-3 (PF SOUTH) FILL

Date Received: 08/31/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Soil

TCLP/SPLP Ext. Date: 09/04/12 14:57

Percent Solids: 94%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
-----------	--------	-----------	-------	----	-----	-----------------	---------------	---------------	-------------	-------------------	---------

TCLP Metals by EPA 1311 - Westborough Lab

Arsenic, TCLP	ND		mg/l	1.0	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:53	EPA 7470A	1,7470A	KL
Selenium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:51	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-04
 Client ID: TP-4 (CODDINGTON) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Percent Solids: 92%

Date Collected: 08/30/12 11:00
 Date Received: 08/31/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/04/12 14:57

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:55	EPA 7470A	1,7470A	KL
Selenium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 15:55	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT

Lab Number: L1215635

Project Number: 5441.2.00

Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-05
 Client ID: TP-5 (NAVY LODGE) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Percent Solids: 92%

Date Collected: 08/30/12 11:00
 Date Received: 08/31/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/04/12 14:57

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:57	EPA 7470A	1,7470A	KL
Selenium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 16:05	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-06
 Client ID: TP-6 (DERECKTORS) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Percent Solids: 91%

Date Collected: 08/30/12 11:00
 Date Received: 08/31/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/04/12 14:57

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:59	EPA 7470A	1,7470A	KL
Selenium, TCLP	ND		mg/l	0.50	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/05/12 13:48	09/05/12 16:08	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01-06 Batch: WG558764-1									
Mercury, TCLP	ND	mg/l	0.0010	--	1	09/05/12 13:46	09/06/12 09:28	1,7470A	KL

Prep Information

Digestion Method: EPA 7470A
TCLP/SPLP Extraction Date: 09/04/12 14:57

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01-06 Batch: WG558867-1									
Arsenic, TCLP	ND	mg/l	1.0	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM
Barium, TCLP	ND	mg/l	0.50	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM
Cadmium, TCLP	ND	mg/l	0.10	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM
Chromium, TCLP	ND	mg/l	0.20	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM
Lead, TCLP	ND	mg/l	0.50	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM
Selenium, TCLP	ND	mg/l	0.50	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM
Silver, TCLP	ND	mg/l	0.10	--	1	09/05/12 13:48	09/05/12 14:45	1,6010C	BM

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 09/04/12 14:57

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Lab Number: L1215635

Project Number: 5441.2.00

Report Date: 09/07/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-06 Batch: WG558764-2								
Mercury, TCLP	86		-		80-120	-		
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-06 Batch: WG558867-2								
Arsenic, TCLP	108		-		75-125	-		20
Barium, TCLP	100		-		75-125	-		20
Cadmium, TCLP	106		-		75-125	-		20
Chromium, TCLP	100		-		75-125	-		20
Lead, TCLP	98		-		75-125	-		20
Selenium, TCLP	108		-		75-125	-		20
Silver, TCLP	102		-		75-125	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG558764-4 QC Sample: L1214972-07 Client ID: MS Sample												
Mercury, TCLP	ND	0.005	0.0057	114	-	-	-	-	70-130	-	-	20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG558867-4 QC Sample: L1214972-07 Client ID: MS Sample												
Arsenic, TCLP	ND	1.2	1.3	108	-	-	-	-	75-125	-	-	20
Barium, TCLP	ND	20	20	100	-	-	-	-	75-125	-	-	20
Cadmium, TCLP	ND	0.51	0.53	104	-	-	-	-	75-125	-	-	20
Chromium, TCLP	ND	2	2.0	100	-	-	-	-	75-125	-	-	20
Lead, TCLP	ND	5.1	4.9	96	-	-	-	-	75-125	-	-	20
Selenium, TCLP	ND	1.2	1.3	108	-	-	-	-	75-125	-	-	20
Silver, TCLP	ND	0.5	0.50	100	-	-	-	-	75-125	-	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1215635

Report Date: 09/07/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG558764-3 QC Sample: L1214972-07 Client ID: DUP Sample						
Mercury, TCLP	ND	ND	mg/l	NC		20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG558867-3 QC Sample: L1214972-07 Client ID: DUP Sample						
Arsenic, TCLP	ND	ND	mg/l	NC		20
Barium, TCLP	ND	ND	mg/l	NC		20
Cadmium, TCLP	ND	ND	mg/l	NC		20
Chromium, TCLP	ND	ND	mg/l	NC		20
Lead, TCLP	ND	ND	mg/l	NC		20
Selenium, TCLP	ND	ND	mg/l	NC		20
Silver, TCLP	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-01
Client ID: TP-1 (BISHOP ROCK) FILL
Sample Location: NEWPORT, RI
Matrix: Soil

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90		%	0.10	NA	1	-	09/01/12 16:50	30,2540G	RD



Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-02
Client ID: TP-2 (PF NORTH) FILL
Sample Location: NEWPORT, RI
Matrix: Soil

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90		%	0.10	NA	1	-	09/01/12 16:50	30,2540G	RD



Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-03
Client ID: TP-3 (PF SOUTH) FILL
Sample Location: NEWPORT, RI
Matrix: Soil

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	94		%	0.10	NA	1	-	09/01/12 16:50	30,2540G	RD



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

SAMPLE RESULTS

Lab ID: L1215635-04
Client ID: TP-4 (CODDINGTON) FILL
Sample Location: NEWPORT, RI
Matrix: Soil

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92		%	0.10	NA	1	-	09/01/12 16:50	30,2540G	RD



Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-05
Client ID: TP-5 (NAVY LODGE) FILL
Sample Location: NEWPORT, RI
Matrix: Soil

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92		%	0.10	NA	1	-	09/01/12 16:50	30,2540G	RD



Project Name: NAVAL STATION NEWPORT**Lab Number:** L1215635**Project Number:** 5441.2.00**Report Date:** 09/07/12**SAMPLE RESULTS**

Lab ID: L1215635-06
Client ID: TP-6 (DEREKTORS) FILL
Sample Location: NEWPORT, RI
Matrix: Soil

Date Collected: 08/30/12 11:00
Date Received: 08/31/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91		%	0.10	NA	1	-	09/01/12 16:50	30,2540G	RD



Lab Duplicate Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1215635

Report Date: 09/07/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG558421-1 QC Sample: L1215639-01 Client ID: DUP Sample						
Solids, Total	89	89	%	0		20

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1215635-01A	Vial Large unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1215635-01B	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-01C	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-01S	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-01T	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-01U	Amber 1000ml unpreserved split	A	N/A	3	Y	Absent	TCLP-8270(14)
L1215635-01X	Plastic 250ml HNO3 preserved spl	A	N/A	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1215635-02A	Vial Large unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1215635-02B	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-02C	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-02S	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-02T	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-02U	Amber 1000ml unpreserved split	A	N/A	3	Y	Absent	TCLP-8270(14)
L1215635-02X	Plastic 250ml HNO3 preserved spl	A	N/A	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1215635-03A	Vial Large unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1215635-03B	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-03C	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-03S	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-03T	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-03U	Amber 1000ml unpreserved split	A	N/A	3	Y	Absent	TCLP-8270(14)
L1215635-03X	Plastic 250ml HNO3 preserved spl	A	N/A	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1215635-04A	Vial Large unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)

*Values in parentheses indicate holding time in days

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1215635

Report Date: 09/07/12

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1215635-04B	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-04C	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-04S	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-04T	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-04U	Amber 1000ml unpreserved split	A	N/A	3	Y	Absent	TCLP-8270(14)
L1215635-04X	Plastic 250ml HNO3 preserved spl	A	N/A	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1215635-05A	Vial Large unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1215635-05B	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-05C	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-05S	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-05T	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-05U	Amber 1000ml unpreserved split	A	N/A	3	Y	Absent	TCLP-8270(14)
L1215635-05X	Plastic 250ml HNO3 preserved spl	A	N/A	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1215635-06A	Vial Large unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1215635-06B	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-06C	Amber 250ml unpreserved	A	N/A	3	Y	Absent	TS(7),TPH-DRO-D(14)
L1215635-06S	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-06T	Vial unpreserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1215635-06U	Amber 1000ml unpreserved split	A	N/A	3	Y	Absent	TCLP-8270(14)
L1215635-06X	Plastic 250ml HNO3 preserved spl	A	N/A	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)

Container Comments

L1215635-01X

L1215635-02X

L1215635-03X

L1215635-04X

L1215635-05X

L1215635-06X

*Values in parentheses indicate holding time in days



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- | | |
|-----------|---|
| A | - Spectra identified as "Aldol Condensation Product". |
| B | - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. |
| C | - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses. |
| D | - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte. |
| E | - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument. |
| G | - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated. |
| H | - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection. |
| I | - The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference. |
| M | - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte. |
| NJ | - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search. |

Report Format: Data Usability Report



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

Data Qualifiers

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the reporting limit (RL) for the sample.

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1215635
Report Date: 09/07/12

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.
- 30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certificate/Approval Program Summary

Last revised August 16, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. **NELAP Accredited Solid Waste/Soil.**

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Silver, Sodium, Thallium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform -MF mEndo (SM9222B), Total Coliform – Colilert (SM9223, Enumeration and P/A), E. Coli. – Colilert (SM9223, Enumeration and P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform-EC Medium (SM 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), CT-Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), E. Coli – Colilert (SM9223 Enumeration), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterococcus - Enterolert.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, CT-Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dieldrin, Dieldrin, 2,4-D, 2,4,5-T, 2,4,5-TP (Silvex), Dalapon, Volatile Organics (SW 8260), Acid Extractables (Phenols) (SW 8270), Benzidines (SW 8270), Phthalates (SW 8270), Nitrosamines (SW 8270), Nitroaromatics & Cyclic Ketones (SW 8270), PAHs (SW 8270), Haloethers (SW 8270), Chlorinated Hydrocarbons (SW 8270).)

Maine Department of Human Services Certificate/Lab ID: 2009024.

Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500CI-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H +B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500CI-D, 4500CI-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.

Drinking Water (Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd, Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM 4500CI-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,F e,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1, SM2510B, 2540C, 2340B, 2320B, 4 500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia -N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Ni trate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 53 10C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.

Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (CollertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 90 10B, 9030B, 9040B, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 254 0C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D, 3060A. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, S W-846 8082, 8082A, 8081A, 8081B, 8151A, 8330, 8270C-SIM, 8270D-SIM.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 904 5C, 9050, 9065,1311, 1312, 3005A, 30 50B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3050B, 3580A, 3 630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8 151A, 8015B, 8015C, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9 223B, 9215B, 4 500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.1, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500 CI-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM 4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM2520B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 62 4, 625, SW-8 46 3630C, 5030B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6 010C, 6020, 6020A, 7196A, 3060A, 9 010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9040C, 9045C, 9045D, 9050A, 9065, 9251. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200. 7, 245.2, SM5310C, EPA 332. 0, SM2320B, EPA 300.0, S M2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222 B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, S M4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510 C, EPA 120.1, SM2510B, SM4500S -D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010 C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9040C, 9045D. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035A-H, 5035A-L.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. (Inorganic Parameters: SM2310B, 2320B, 4500Cl-E, 4500Cn-E, 9014, Lachat 10-204-00-1-X, 1010A, 1030, 4500NO3-F, 353.2, 4500P-E, 4500SO4-E, 300.0, 4500S-D, 5310B, 5310C, 6010C, 6020A, 200.7, 200.8, 3500Cr-B, 7196A, 245.1, 7471A, 7471B, 1311,1312. Organic Parameters: 608, 8081B, 8082A, 624, 8260B, 625, 8270D, 8151A, 8015C, 504.1, MA-EPH, MA-VPH.)

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. *NELAP Accredited.*
Drinking Water (Inorganic Parameters: 200.7, 200.8, 245.2, 300.0, 332.0, 2120B, 2320B, 2510B, 2540C, 4500-CN-CE, 4500F-C, 4500H+-B, 4500NO3-F, 5310C. Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1312, 3005A,3015, 3060A, 200.7, 200.8, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE, 245.1, 300.0, 3501., 350.2, 353.2, 420.1, 6010B, 6010C, 6020, 6020A, 7196A, 7470A, 9010B, 9030B, 9040B, Lachat 10-107-06-2-D, NJ-EPH, 2120B, 2310B, 2320B, 2340B, 2510C, 2540B, 2540C, 3500Cr-D, 436C, 4500CN-CE, 4500Cl-E, 4500F-B, 4500F-C, 4500H+-B, 4500NO2-B, 4500NO3-F, 4500S-D, 4500SO3-B, 5310BCD, 5540C. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330, 8015B,)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3005A, 3050B, 3060A, 6010B, 6010C, 6020A, 7196A, 7471A, 7471B, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-BH, 9030B, 9038, 9251. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, NJ-EPH.)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. *NELAP Accredited via NJ-DEP.*

Refer to MA-DEP Certificate for Potable and Non-Potable Water.

Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commission on Environmental Quality Certificate/Lab ID: T104704476-09-1. *NELAP Accredited.*

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S²⁻D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. *NELAP Accredited.*

Drinking Water (Inorganic Parameters: EPA 200.7, 200.8, 300.0, 2510B, 2120B, 2540C, 4500CN-CE, 245.2, 2320B, 4500F-C, 4500F-C, 4500NO3-F, 5310C. Organic Parameters: EPA 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 200.7, 200.8, 245.1, 300.0, 3005A, 3015, 1312, 6010B, 6010C, 3060A, 353.2, 420.1, 6020, 6020A, SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X, 7196A, 7470A, 9010B, 9040B, 2310B, 2320B, 2510B, 2540B, 2540C, 3500Cr-D, 426C, 4500Cl-E, 4500F-B, 4500F-C, 4500PE, 510AC, 5210B, 5310B 5310C, 5540C. Organic Parameters: EPA 3510C, 3630C, 5030B, 8260B, 608, 624, 625, 8081A, 8081B, 8082, 8082A, 8151A, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330,)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010A, 1030, 3060A, 3050B, 1311, 1312, 6010B, 6010C, 6020, , 7196A, 7471A, 7471B, 6020A, 9030B, 9010B, 9012A, 9014 9040B, 9045C, 9050A, 9065. Organic Parameters: EPA 5035, 3540C, 3546, 3550, 3580, 3630C, 8260B, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.

Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:

EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl na phthalene, Dimethyl naphthalene, Total Methylnaphthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4 -Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO₂ in a soil matrix, NO₃ in a soil matrix, SO₄ in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease.



ANALYTICAL REPORT

Lab Number:	L1216084
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	NAVAL STATION NEWPORT
Project Number:	5441.2.00
Report Date:	09/14/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1216084-01	TP-7 (NUWC) FILL	NEWPORT, RI	09/06/12 11:00

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Case Narrative (continued)

TCLP Semivolatile Organics

The WG560348-2/-3 LCS/LCSD recoveries, associated with L1216084-01, were above the acceptance criteria for 2,4-Dinitrotoluene (116%/104%) and Pentachlorophenol (116%/108%); however, the associated sample was non-detect for these target compounds. The results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 09/14/12

ORGANICS

VOLATILES

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216084**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216084-01
Client ID: TP-7 (NUWC) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 09/12/12 10:32
Analyst: MM
Percent Solids: 95%
TCLP/SPLP Ext. Date: 09/11/12 15:00

Date Collected: 09/06/12 11:00
Date Received: 09/10/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	7.5	--	10
Carbon tetrachloride	ND		ug/l	5.0	--	10
Tetrachloroethene	ND		ug/l	5.0	--	10
Chlorobenzene	ND		ug/l	5.0	--	10
1,2-Dichloroethane	ND		ug/l	5.0	--	10
Benzene	ND		ug/l	5.0	--	10
Vinyl chloride	ND		ug/l	10	--	10
1,1-Dichloroethene	ND		ug/l	5.0	--	10
Trichloroethene	ND		ug/l	5.0	--	10
1,4-Dichlorobenzene	ND		ug/l	25	--	10
2-Butanone	ND		ug/l	50	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	104		70-130

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C
Analytical Date: 09/12/12 08:58
Analyst: MM
TCLP Extraction Date: 09/11/12 15:00

Extraction Date: 09/11/12 15:00

Parameter	Result	Qualifier	Units	RL	MDL
TCLP Volatiles by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG560307-3					
Chloroform	ND		ug/l	7.5	--
Carbon tetrachloride	ND		ug/l	5.0	--
Tetrachloroethene	ND		ug/l	5.0	--
Chlorobenzene	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	5.0	--
Benzene	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	10	--
1,1-Dichloroethene	ND		ug/l	5.0	--
Trichloroethene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	25	--
2-Butanone	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	104		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
TCLP Volatiles by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG560307-1 WG560307-2								
Chloroform	96		97		70-130	1		20
Carbon tetrachloride	76		86		63-132	12		20
Tetrachloroethene	86		90		70-130	5		20
Chlorobenzene	87		91		75-130	4		25
1,2-Dichloroethane	94		102		70-130	8		20
Benzene	92		94		70-130	2		25
Vinyl chloride	106		112		55-140	6		20
1,1-Dichloroethene	91		96		61-145	5		25
Trichloroethene	91		94		70-130	3		25
1,4-Dichlorobenzene	89		92		70-130	3		20
2-Butanone	83		84		63-138	1		20

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
1,2-Dichloroethane-d4	105		104		70-130
Toluene-d8	102		101		70-130
4-Bromofluorobenzene	103		103		70-130
Dibromofluoromethane	102		101		70-130

SEMIVOLATILES

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216084-01
 Client ID: TP-7 (NUWC) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Analytical Method: 1,8270D
 Analytical Date: 09/13/12 10:54
 Analyst: RC
 Percent Solids: 95%
 TCLP/SPLP Ext. Date: 09/11/12 15:46

Date Collected: 09/06/12 11:00
 Date Received: 09/10/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/12/12 17:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	75		21-120
Phenol-d6	71		10-120
Nitrobenzene-d5	74		23-120
2-Fluorobiphenyl	77		15-120
2,4,6-Tribromophenol	101		10-120
4-Terphenyl-d14	97		33-120

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
Analytical Date: 09/13/12 09:32
Analyst: RC
TCLP Extraction Date: 09/11/12 15:46

Extraction Method: EPA 3510C
Extraction Date: 09/12/12 17:04

Parameter	Result	Qualifier	Units	RL	MDL
TCLP Semivolatiles by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG560348-1					
Hexachlorobenzene	ND		ug/l	10	--
2,4-Dinitrotoluene	ND		ug/l	25	--
Hexachlorobutadiene	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	10	--
Nitrobenzene	ND		ug/l	10	--
2,4,6-Trichlorophenol	ND		ug/l	25	--
Pentachlorophenol	ND		ug/l	50	--
2-Methylphenol	ND		ug/l	25	--
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--
2,4,5-Trichlorophenol	ND		ug/l	25	--
Pyridine	ND		ug/l	25	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	85		21-120
Phenol-d6	78		10-120
Nitrobenzene-d5	79		23-120
2-Fluorobiphenyl	76		15-120
2,4,6-Tribromophenol	96		10-120
4-Terphenyl-d14	99		33-120

Lab Control Sample Analysis Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Semivolatiles by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG560348-2 WG560348-3								
Hexachlorobenzene	104		96		40-140	8		30
2,4-Dinitrotoluene	116	Q	104	Q	24-96	11		30
Hexachlorobutadiene	82		73		40-140	12		30
Hexachloroethane	79		65		40-140	19		30
Nitrobenzene	92		83		40-140	10		30
2,4,6-Trichlorophenol	110		101		30-130	9		30
Pentachlorophenol	116	Q	108	Q	9-103	7		30
2-Methylphenol	98		83		30-130	17		30
3-Methylphenol/4-Methylphenol	99		86		30-130	14		30
2,4,5-Trichlorophenol	114		101		30-130	12		30
Pyridine	42		44		10-66	5		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	97		85		21-120
Phenol-d6	96		83		10-120
Nitrobenzene-d5	93		80		23-120
2-Fluorobiphenyl	98		89		15-120
2,4,6-Tribromophenol	120		112		10-120
4-Terphenyl-d14	104		97		33-120

PETROLEUM HYDROCARBONS

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216084**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216084-01
Client ID: TP-7 (NUWC) FILL
Sample Location: NEWPORT, RI
Matrix: Soil
Analytical Method: 1,8015C(M)
Analytical Date: 09/11/12 18:24
Analyst: AR
Percent Solids: 95%

Date Collected: 09/06/12 11:00
Date Received: 09/10/12
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 09/11/12 08:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	33200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	58		40-140

Project Name: NAVAL STATION NEWPORT

Lab Number: L1216084

Project Number: 5441.2.00

Report Date: 09/14/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
 Analytical Date: 09/11/12 16:49
 Analyst: AR

Extraction Method: EPA 3546
 Extraction Date: 09/11/12 08:58

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01 Batch: WG559904-1					
TPH	ND		ug/kg	32800	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	64		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Lab Number: L1216084

Project Number: 5441.2.00

Report Date: 09/14/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01 Batch: WG559904-2								
TPH	85		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	81				40-140

Lab Duplicate Analysis
Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1216084

Report Date: 09/14/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01 QC Batch ID: WG559904-3 QC Sample: L1216084-01 Client ID: TP-7 (NUWC) FILL						
TPH	ND	ND	ug/kg	NC		40

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	58		70		40-140

METALS

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216084-01
 Client ID: TP-7 (NUWC) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil
 Percent Solids: 95%

Date Collected: 09/06/12 11:00
 Date Received: 09/10/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/11/12 15:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:40	EPA 7470A	1,7470A	AK
Selenium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 18:21	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG560211-1									
Mercury, TCLP	ND	mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:29	1,7470A	AK

Prep Information

Digestion Method: EPA 7470A
TCLP/SPLP Extraction Date: 09/11/12 15:46

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG560475-1									
Arsenic, TCLP	ND	mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM
Barium, TCLP	ND	mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM
Cadmium, TCLP	ND	mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM
Chromium, TCLP	ND	mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM
Lead, TCLP	ND	mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM
Selenium, TCLP	ND	mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM
Silver, TCLP	ND	mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:42	1,6010C	BM

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 09/11/12 15:46

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Lab Number: L1216084

Project Number: 5441.2.00

Report Date: 09/14/12

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG560211-2								
Mercury, TCLP	109		-		80-120	-		
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG560475-2								
Arsenic, TCLP	108		-		75-125	-		20
Barium, TCLP	105		-		75-125	-		20
Cadmium, TCLP	108		-		75-125	-		20
Chromium, TCLP	100		-		75-125	-		20
Lead, TCLP	98		-		75-125	-		20
Selenium, TCLP	108		-		75-125	-		20
Silver, TCLP	98		-		75-125	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG560211-4 QC Sample: L1216013-01 Client ID: MS Sample												
Mercury, TCLP	ND	0.005	0.007	140	Q	-	-		70-130	-		20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG560475-4 QC Sample: L1215848-01 Client ID: MS Sample												
Arsenic, TCLP	ND	1.2	1.4	117		-	-		75-125	-		20
Barium, TCLP	0.80	20	23	111		-	-		75-125	-		20
Cadmium, TCLP	ND	0.51	0.59	116		-	-		75-125	-		20
Chromium, TCLP	ND	2	2.0	100		-	-		75-125	-		20
Lead, TCLP	1.0	5.1	6.2	102		-	-		75-125	-		20
Selenium, TCLP	ND	1.2	1.3	108		-	-		75-125	-		20
Silver, TCLP	ND	0.5	0.48	96		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1216084

Report Date: 09/14/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG560211-3 QC Sample: L1216013-01 Client ID: DUP Sample						
Mercury, TCLP	ND	ND	mg/l	NC		20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG560475-3 QC Sample: L1215848-01 Client ID: DUP Sample						
Lead, TCLP	1.0	1.2	mg/l	18		20

INORGANICS & MISCELLANEOUS

Project Name: NAVAL STATION NEWPORT

Lab Number: L1216084

Project Number: 5441.2.00

Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216084-01
 Client ID: TP-7 (NUWC) FILL
 Sample Location: NEWPORT, RI
 Matrix: Soil

Date Collected: 09/06/12 11:00
 Date Received: 09/10/12
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	95		%	0.10	NA	1	-	09/11/12 12:45	30,2540G	SD



Lab Duplicate Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1216084

Report Date: 09/14/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG559983-1 QC Sample: L1216071-01 Client ID: DUP Sample						
Solids, Total	94	93	%	1		20

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216084**Project Number:** 5441.2.00**Report Date:** 09/14/12**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1216084-01A	Vial Large unpreserved	A	N/A	4	Y	Absent	TCLP-EXT-ZHE(14)
L1216084-01B	Amber 250ml unpreserved	A	N/A	4	Y	Absent	TS(7),TPH-DRO-D(14)
L1216084-01C	Amber 250ml unpreserved	A	N/A	4	Y	Absent	TS(7),TPH-DRO-D(14)
L1216084-01W	Amber 1000ml unpreserved split	A	N/A	4	Y	Absent	TCLP-8270(14)
L1216084-01X	Vial unpreserved split	A	N/A	4	Y	Absent	TCLP-VOA(14)
L1216084-01Y	Vial unpreserved split	A	N/A	4	Y	Absent	TCLP-VOA(14)
L1216084-01Z	Plastic 250ml HNO3 preserved spl	A	<2	4	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)

*Values in parentheses indicate holding time in days

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

Data Qualifiers

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the reporting limit (RL) for the sample.

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216084
Report Date: 09/14/12

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.
- 30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certificate/Approval Program Summary

Last revised August 16, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. **NELAP Accredited Solid Waste/Soil.**

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Selenium, Silver, Sodium, Thallium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform -MF mEndo (SM9222B), Total Coliform – Colilert (SM9223, Enumeration and P/A), E. Coli. – Colilert (SM9223, Enumeration and P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform-EC Medium (SM 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), CT-Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), E. Coli – Colilert (SM9223 Enumeration), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterococcus - Enterolert.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, CT-Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dieldrin, Dieldrin, 2,4-D, 2,4,5-T, 2,4,5-TP (Silvex), Dalapon, Volatile Organics (SW 8260), Acid Extractables (Phenols) (SW 8270), Benzidines (SW 8270), Phthalates (SW 8270), Nitrosamines (SW 8270), Nitroaromatics & Cyclic Ketones (SW 8270), PAHs (SW 8270), Haloethers (SW 8270), Chlorinated Hydrocarbons (SW 8270).)

Maine Department of Human Services Certificate/Lab ID: 2009024.

Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500CI-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H +B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500CI-D, 4500CI-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.

Drinking Water (Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd, Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM 4500CI-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,F e,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1, SM2510B, 2540C, 2340B, 2320B, 4 500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia -N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Ni trate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 53 10C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.

Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. *NELAP Accredited.*

Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 90 10B, 9030B, 9040B, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 254 0C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D, 3060A. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, S W-846 8082, 8082A, 8081A, 8081B, 8151A, 8330, 8270C-SIM, 8270D-SIM.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 904 5C, 9050, 9065,1311, 1312, 3005A, 30 50B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3050B, 3580A, 3 630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8 151A, 8015B, 8015C, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. *NELAP Accredited.*

Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9 223B, 9215B, 4 500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.1, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500 CI-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM 4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM2520B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 62 4, 625, SW-8 46 3630C, 5030B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6 010C, 6020, 6020A, 7196A, 3060A, 9 010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9040C, 9045C, 9045D, 9050A, 9065, 9251. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. *NELAP Accredited.*

Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200. 7, 245.2, SM5310C, EPA 332. 0, SM2320B, EPA 300.0, S M2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222 B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, S M4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510 C, EPA 120.1, SM2510B, SM4500S -D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010 C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9040C, 9045D. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035A-H, 5035A-L.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. (Inorganic Parameters: SM2310B, 2320B, 4500Cl-E, 4500Cn-E, 9014, Lachat 10-204-00-1-X, 1010A, 1030, 4500NO3-F, 353.2, 4500P-E, 4500SO4-E, 300.0, 4500S-D, 5310B, 5310C, 6010C, 6020A, 200.7, 200.8, 3500Cr-B, 7196A, 245.1, 7471A, 7471B, 1311,1312. Organic Parameters: 608, 8081B, 8082A, 624, 8260B, 625, 8270D, 8151A, 8015C, 504.1, MA-EPH, MA-VPH.)

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. *NELAP Accredited.*
Drinking Water (Inorganic Parameters: 200.7, 200.8, 245.2, 300.0, 332.0, 2120B, 2320B, 2510B, 2540C, 4500-CN-CE, 4500F-C, 4500H+-B, 4500NO3-F, 5310C. Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1312, 3005A,3015, 3060A, 200.7, 200.8, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE, 245.1, 300.0, 3501., 350.2, 353.2, 420.1, 6010B, 6010C, 6020, 6020A, 7196A, 7470A, 9010B, 9030B, 9040B, Lachat 10-107-06-2-D, NJ-EPH, 2120B, 2310B, 2320B, 2340B, 2510C, 2540B, 2540C, 3500Cr-D, 436C, 4500CN-CE, 4500Cl-E, 4500F-B, 4500F-C, 4500H+-B, 4500NO2-B, 4500NO3-F, 4500S-D, 4500SO3-B, 5310BCD, 5540C. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330, 8015B,)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3005A, 3050B, 3060A, 6010B, 6010C, 6020A, 7196A, 7471A, 7471B, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-BH, 9030B, 9038, 9251. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, NJ-EPH.)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. *NELAP Accredited via NJ-DEP.*

Refer to MA-DEP Certificate for Potable and Non-Potable Water.

Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commission on Environmental Quality Certificate/Lab ID: T104704476-09-1. *NELAP Accredited.*

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S²⁻D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. *NELAP Accredited.*

Drinking Water (Inorganic Parameters: EPA 200.7, 200.8, 300.0, 2510B, 2120B, 2540C, 4500CN-CE, 245.2, 2320B, 4500F-C, 4500F-C, 4500NO3-F, 5310C. Organic Parameters: EPA 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 200.7, 200.8, 245.1, 300.0, 3005A, 3015, 1312, 6010B, 6010C, 3060A, 353.2, 420.1, 6020, 6020A, SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X, 7196A, 7470A, 9010B, 9040B, 2310B, 2320B, 2510B, 2540B, 2540C, 3500Cr-D, 426C, 4500Cl-E, 4500F-B, 4500F-C, 4500PE, 510AC, 5210B, 5310B 5310C, 5540C. Organic Parameters: EPA 3510C, 3630C, 5030B, 8260B, 608, 624, 625, 8081A, 8081B, 8082, 8082A, 8151A, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330,)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010A, 1030, 3060A, 3050B, 1311, 1312, 6010B, 6010C, 6020, , 7196A, 7471A, 7471B, 6020A, 9030B, 9010B, 9012A, 9014 9040B, 9045C, 9050A, 9065. Organic Parameters: EPA 5035, 3540C, 3546, 3550, 3580, 3630C, 8260B, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.

Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:

EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl na phthalene, Dimethyl naphthalene, Total Methylnaphthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4 -Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO₂ in a soil matrix, NO₃ in a soil matrix, SO₄ in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease.



Client:	McPhail Associates
Project Name:	Naval Station Newport
Project Location:	Newport, RI
GTX #:	12211
Test Date:	09/14/12
Tested By:	jbr
Checked By:	jdt

pH of Soil by ASTM D 4972

Boring ID	Sample ID	Depth	Description	pH of Soil in	
				Distilled Water	Calcium Chloride
TP-1	Fill (Bishop Rock)	1-9.5	Moist, brown silt with gravel	6.1	5.5
TP-2	Fill (PF North)	0.5-6	Moist, brown silt with gravel	5.0	5.0
TP-3	Fill (PF South)	0.5-9	Moist, grayish brown sand with gravel	5.9	5.0
TP-4	Fill (Coddington)	0.5-4	Moist, redish brownsilt with gravel	4.6	4.3
TP-5	Organic (Navy Lodge)	5-15	Moist, dark brown silt with organics	6.6	6.2
TP-6	Fill (Derecktors)	0.3-7	Moist, brown sand with gravel	6.3	6.3
TP-7	Fill (NUMC)	0-2.5	Moist, yellowish brown silty sand with gravel	5.6	5.1

Notes: Method A, pH meter used
Sample preparation: screened through a #10 sieve



Client:	McPhail Associates
Project:	Naval Station Newport
Location:	Newport, RI
GTX#:	12211
Test Date:	09/17/12
Tested By:	jek
Checked By:	jdt

**Laboratory Measurement of Soil Resistivity Using
the Wenner Four-Electrode Method by ASTM G 57**

Boring ID	Sample ID	Depth	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, (ohm-cm) ⁻¹
TP-1	Fill (Bishop Rock)	1.9-5	Moist, brown silt with gravel	835	1.20E-03
TP-2	Fill (PF North)	0.5-6	Moist, brown silt with gravel	5,669	1.76E-04
TP-3	Fill (PF South)	0.5-9	Moist, grayish brown sand with gravel	3,879	2.58E-04
TP-4	Fill (Coddington)	0.5-4	Moist, reddish brown silt with sand	33,817	2.96E-05
TP-5	Organic (Navy Lodge)	5-15	Moist, dark brown silt with organincs	209	4.79E-03
TP-6	Fill (Derecktors)	0.3-7	Moist, brown sand with gravel	10,941	9.14E-05
TP-7	Fill (NUMC)	0-2.5	Moist, yellowish brown silty sand with gravel	2,785	3.59E-04

Notes: Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G 57)
 Test conducted in standard laboratory atmosphere: 68-73 F



41765 Hawthorn Street Murrieta, CA 92562
ph (951) 894-2682 • fx (951) 894-2683

Work Order No.: 1211265
Client: GeoTesting Express
Project No.: GTX: 12211
Project Name: Naval Station Newport
Report Date: September 20, 2012

Laboratory Test(s) Results Summary

The subject soil samples were processed with the U.S. Standard No. 10 Sieve and tested for Water-Soluble Sulfate Ion Content per AASHTO Standard T 290-95 (2003) and Water-Soluble Chloride Ion Content per AASHTO Standard T 291-94 (2004) Method A.

The test results follow:

Sample Identification	Sulfate Content (mg/kg)	Chloride Content (mg/kg)
TP-1 @ 1-9.5 ft. - Fill (Bishop Rock)	150	400
TP-2 @ 0.5-6 ft. - Fill (PF North)	20	70
TP-3 @ 0.5-9 ft. - Fill (PF South)	60	30
TP-4 @ 0.5-4 ft. - Fill (Coddington)	50	10
TP-5 @ 5-15 ft. - Organic (Navy Lodge)	1,630	2,840
TP-6 @ 0.3-7 ft. - Fill (Derecktors)	ND	20
TP-7 @ 0-2.5 ft. - Fill (NUWC)	310	80

*ND=No Detection

We appreciate the opportunity to serve you. Please do not hesitate to contact us with any questions or clarifications regarding these results or procedures.

Ahmet K. Kaya, Laboratory Manager





ProScience Analytical Services, Inc

Jonathan Patch
McPhail Associates, Inc.
2269 Massachusetts Ave.
Cambridge, MA 02140

September 17, 2012

Dear Jonathan Patch,

The enclosed analytical results have been obtained using the EPA/600/R-93/116 method. However the sample preparation technique used was in accordance with the US EPA office of Environmental Evaluation and Measurement -Region 1 requirements. This technique implies the elimination of interfering particles through several steps which include the homogenization of the sample, separation of different fractions and mandatory examination under the stereomicroscope. Asbestos content less than 1% is recorded on the report as "TR"(Trace).

The quality control data related to the samples analyzed is available upon client's written request. ProScience Analytical Services Inc., assumes no responsibility for potential sample contamination that may have occurred during the sample collection process or erroneous data provided by the client.

The enclosed results may not be used under any circumstances as product endorsement by any US government agency including NIST/NVLAP.

All Laboratory records are retained for at least three years unless otherwise directed in writing by the client. The actual samples are retained for a period of two months and written request is necessary in order to be retained for a longer period of time. All analytical results and records are considered strictly confidential and will not be released under any circumstances to anyone except the actual client. The analytical results included in this report apply only to the items tested.

If you have any questions please contact the Laboratory Manager or the Laboratory Director.

Sincerely,

Stefanie Bishop, Optical Asbestos Manager

Aimee Cormier, Laboratory Director

Enclosure:

LAB BATCH ID: S 83189 CLIENT PROJECT ID: 5441.2.00

Client Ref: Naval Station, Newport, RI

AIHA ID# 102754; CT ID# PH-0209; MA ID# AA000156; ME ID# LB-055; ME ID# LA-056; NVLAP Lab Code 200090-0; RI ID # AAL-093; VT ID# AL016876

ProScience Analytical Services, Inc.

Client #: 562
 Client Project: 5441.2.00
 Client Reference: Naval Station, Newport, RI
 Client Name: McPhail Associates, Inc.
 Method: EPA/600/R-93/116; ENV.EVAL. and MEAS.- REGION 1 Requirements

Batch: S 83189
 Date Sampled: 8/30/2012
 Date Received: 9/10/2012
 Date Analyzed: 9/17/2012
 Date of Report: 9/17/2012

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
1	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: TP-1 (Bishop Rock) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
2	Brown	0	0	0	0	0	0	0	0	2	0	0	0	98

Description: TP-2 (PF North) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
3	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: TP-3 (PF South) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
4	Brown	0	0	0	0	0	0	0	0	2	0	0	0	98

Description: TP-4 (Coddington) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
5	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: TP-5 (Davy Lodge) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
6	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: TP-6 (Derecktors) fill
 Location: N/A
 Comments: Analyzed: Yes

ProScience Analytical Services, Inc.

Client #: 562
 Client Project: 5441.2.00
 Client Reference: Naval Station, Newport, RI
 Client Name: McPhail Associates, Inc.
 Method: EPA/600/R-93/116; ENV.EVAL. and MEAS.- REGION 1 Requirements

Batch: S 83189
 Date Sampled: 8/30/2012
 Date Received: 9/10/2012
 Date Analyzed: 9/17/2012
 Date of Report: 9/17/2012

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
7	Brown	0	0	0	0	0	0	0	0	0	0	0	0	100
Description: TP-7 (NUWC) fill Location: N/A Comments: Analyzed: Yes														

Asbestos Codes: CHR = Chrysotile AMO = Amosite CRO = Crocidolite ACT = Actinolite TRE = Tremolite ANT = Anthophyllite

Non-Asbestos Codes: FBG = Fiberglass MNW = Mineral Wool CEL = Cellulose HAR = Hair SYN = Synthetic OTH = Other NON = Non-Fibrous Minerals

Note: To create a unique lab sample ID, use the Batch # and the Sample ID (example: [Batch #] - [Sample ID]).

* All results are in percentage



 Dan Pine, Analyst

ProScience Analytical Services, Inc.

Client #: 562
 Client Project: 5441.2.00
 Client Reference: Naval Station, Newport, RI
 Client Name: McPhail Associates, Inc.
 Method: EPA/600/R-93/116; ENV.EVAL. and MEAS.- REGION 1 Requirements

Batch: **S 83189**
 Date Sampled: 8/30/2012
 Date Received: 9/10/2012
 Date Analyzed: 9/17/2012
 Date of Report: 9/17/2012

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
1	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: Soil - TP-1 (Bishop Rock) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
2	Brown	0	0	0	0	0	0	0	0	2	0	0	0	98

Description: Soil - TP-2 (PF North) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
3	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: Soil - TP-3 (PF South) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
4	Brown	0	0	0	0	0	0	0	0	2	0	0	0	98

Description: Soil - TP-4 (Coddington) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
5	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: Soil - TP-5 (Davy Lodge) fill
 Location: N/A
 Comments: Analyzed: Yes

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
6	Brown	0	0	0	0	0	0	0	0	TR	0	0	0	100

Description: Soil - TP-6 (Derecktors) fill
 Location: N/A
 Comments: Analyzed: Yes

ProScience Analytical Services, Inc.

Client #: 562
 Client Project: 5441.2.00
 Client Reference: Naval Station, Newport, RI
 Client Name: McPhail Associates, Inc.
 Method: EPA/600/R-93/116; ENV.EVAL. and MEAS.- REGION 1 Requirements

Batch: S 83189
 Date Sampled: 8/30/2012
 Date Received: 9/10/2012
 Date Analyzed: 9/17/2012
 Date of Report: 9/17/2012

Sample ID	Color	ASBESTOS %						NON-ASBESTOS %						
		CHR	AMO	CRO	ACT	TRE	ANT	FBG	MNW	CEL	HAR	SYN	OTH	NON
7	Brown	0	0	0	0	0	0	0	0	0	0	0	0	100
Description: Soil - TP-7 (NUWC) fill Location: N/A Comments: Analyzed: Yes														

Asbestos Codes: CHR = Chrysotile AMO = Amosite CRO = Crocidolite ACT = Actinolite TRE = Tremolite ANT = Anthophyllite

Non-Asbestos Codes: FBG = Fiberglass MNW = Mineral Wool CEL = Cellulose HAR = Hair SYN = Synthetic OTH = Other NON = Non-Fibrous Minerals

Note: To create a unique lab sample ID, use the Batch # and the Sample ID (example: [Batch #] - [Sample ID]).

* All results are in percentage

 Dan Pine, Analyst

TAT
 (circle one)

3 Hours 6 Hours Same Day Next Day
 2 Days 3 Days 4-5 Days Other _____
 TAT in bus, days - lab approval required for rush analysis

PASI Batch #
 583189

Client: McPhail Associates, LLC

Address: 2269 Mass Ave, Cambridge MA

Project #: 5441200 PO: 5441200

Project Site: Naval Station Newport, RI

Contact: Jonathan Petch

Tel. / Fax #: 617 868 1420 x316

Email: jp@mcphailgeo.com

PLM

Chain of Custody
 ver 4.2 Updated 8/10/11

Results: email tax verbal By: _____ Date: _____

Stop on first positive: Yes / No

Analyst/Date: JP / 9/17/12 QC by/Date: _____

Relinquished By: [Signature] Date: 9/10/12

Received By: [Signature] Date: 9/10/2012

of Samples Received: 7 Analyzed: _____

Sample ID	Date Sampled	Description / Location	Stereoscope		Optical Properties							Asbestos Percentage (%)					Non Asbestos Percentage (%)					
			SSAPE	Color	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI	Chrysotile	Amosite	Crocidolite	Tremolite	Anthophyllite	Actinolite	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non Fibrous
1	8/30/12	TP-1 (Bishop Rock) Fill	0	BRN/gy																		100
2	8/30/12	TP-2 (PF North) Fill	0	BRN/gy																		98
3	8/30/12	TP-3 (PF South) Fill	0	BRN/gy																		100
4	8/30/12	TP-4 (Lodding) Fill	0	BRN/gy																		98
5	8/30/12	TP-5 (Navy Lodge) Fill	0	BRN/gy																		100
6	8/30/12	TP-6 (Directors) Fill	0	BRN/gy																		100



APPENDIX H

Laboratory Chemical Testing Data - Groundwater



ANALYTICAL REPORT

Lab Number:	L1216093
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	NAVAL STATION NEWPORT
Project Number:	5441.2.00
Report Date:	09/14/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1216093-01	B-2 (OW) BISHOP ROCK	NEWPORT, RI	09/10/12 09:30
L1216093-02	B-6 (OW) PF SOUTH	NEWPORT, RI	09/10/12 10:15
L1216093-03	B-12 (OW) DERECKTORS	NEWPORT, RI	09/10/12 12:00
L1216093-04	B-9 (OW) NAVY LODGE	NEWPORT, RI	09/10/12 13:00
L1216093-05	B-3 (OW) PF NORTH	NEWPORT, RI	09/10/12 14:45

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Case Narrative (continued)

TCLP Semivolatile Organics SIM

The WG559986-2/-3 LCS/LCSD recoveries, associated with L1216093-01 through -05, were above the acceptance criteria for 2,4-Dinitrotoluene (LCS at 105%) and Pentachlorophenol (110%/104%); however, the associated samples were non-detect for these target compounds. The results of the original analysis are reported.

TCLP Metals

The WG560213-4 MS recovery, performed on L1216093-01, is above the acceptance criteria for Mercury (136%). A post digestion spike was performed with an acceptable recovery of 114%.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 09/14/12

ORGANICS

VOLATILES

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-01
 Client ID: B-2 (OW) BISHOP ROCK
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 09/13/12 16:19
 Analyst: MM

Date Collected: 09/10/12 09:30
 Date Received: 09/10/12
 Field Prep: Not Specified

TCLP/SPLP Ext. 09/11/12 12:20
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
2-Butanone	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	114		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	104		70-130
dibromofluoromethane	101		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-02
 Client ID: B-6 (OW) PF SOUTH
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 09/13/12 14:13
 Analyst: MM

Date Collected: 09/10/12 10:15
 Date Received: 09/10/12
 Field Prep: Not Specified

TCLP/SPLP Ext. 09/11/12 12:20
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
2-Butanone	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	105		70-130
dibromofluoromethane	101		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-03
 Client ID: B-12 (OW) DERECKTORS
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 09/13/12 14:44
 Analyst: MM

Date Collected: 09/10/12 12:00
 Date Received: 09/10/12
 Field Prep: Not Specified

TCLP/SPLP Ext. 09/11/12 12:20
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
2-Butanone	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	115		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	105		70-130
dibromofluoromethane	104		70-130

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-04
 Client ID: B-9 (OW) NAVY LODGE
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 09/13/12 15:16
 Analyst: MM

Date Collected: 09/10/12 13:00
 Date Received: 09/10/12
 Field Prep: Not Specified

TCLP/SPLP Ext. 09/11/12 12:20
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
2-Butanone	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	103		70-130
dibromofluoromethane	100		70-130

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-05
 Client ID: B-3 (OW) PF NORTH
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 09/13/12 15:47
 Analyst: MM

Date Collected: 09/10/12 14:45
 Date Received: 09/10/12
 Field Prep: Not Specified

TCLP/SPLP Ext. 09/11/12 12:20
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Volatiles by EPA 1311 - Westborough Lab						
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
2-Butanone	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	104		70-130
dibromofluoromethane	101		70-130

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C
Analytical Date: 09/13/12 08:59
Analyst: MM
TCLP Extraction Date: 09/11/12 12:20

Extraction Date: 09/11/12 12:20

Parameter	Result	Qualifier	Units	RL	MDL
TCLP Volatiles by EPA 1311 - Westborough Lab for sample(s): 01-05 Batch: WG560727-3					
Chloroform	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
Tetrachloroethene	ND		ug/l	0.50	--
Chlorobenzene	ND		ug/l	0.50	--
1,2-Dichloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
Trichloroethene	ND		ug/l	0.50	--
1,4-Dichlorobenzene	ND		ug/l	2.5	--
2-Butanone	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	103		70-130
dibromofluoromethane	98		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
TCLP Volatiles by EPA 1311 - Westborough Lab Associated sample(s): 01-05 Batch: WG560727-1 WG560727-2								
Chloroform	96		93		70-130	3		20
Carbon tetrachloride	74		67		63-132	10		20
Tetrachloroethene	88		86		70-130	2		20
Chlorobenzene	88		87		75-130	1		25
1,2-Dichloroethane	98		96		70-130	2		20
Benzene	93		92		70-130	1		25
Vinyl chloride	114		105		55-140	8		20
1,1-Dichloroethene	93		91		61-145	2		25
Trichloroethene	90		90		70-130	0		25
1,4-Dichlorobenzene	89		87		70-130	2		20
2-Butanone	88		77		63-138	13		20

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
1,2-Dichloroethane-d4	102		105		70-130
Toluene-d8	101		100		70-130
4-Bromofluorobenzene	102		103		70-130
Dibromofluoromethane	102		102		70-130

SEMIVOLATILES

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-01
 Client ID: B-2 (OW) BISHOP ROCK
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 09/12/12 11:56
 Analyst: RC

Date Collected: 09/10/12 09:30
 Date Received: 09/10/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/11/12 12:51

TCLP/SPLP Ext. 09/11/12 09:22
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	85		21-120
Phenol-d6	83		10-120
Nitrobenzene-d5	85		23-120
2-Fluorobiphenyl	89		15-120
2,4,6-Tribromophenol	111		10-120
4-Terphenyl-d14	100		33-120

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-02
 Client ID: B-6 (OW) PF SOUTH
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 09/12/12 12:23
 Analyst: RC

Date Collected: 09/10/12 10:15
 Date Received: 09/10/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/11/12 12:51

TCLP/SPLP Ext. 09/11/12 09:22
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	81		21-120
Phenol-d6	77		10-120
Nitrobenzene-d5	77		23-120
2-Fluorobiphenyl	79		15-120
2,4,6-Tribromophenol	96		10-120
4-Terphenyl-d14	84		33-120

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-03
 Client ID: B-12 (OW) DERECKTORS
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 09/12/12 12:51
 Analyst: RC

Date Collected: 09/10/12 12:00
 Date Received: 09/10/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/11/12 12:51

TCLP/SPLP Ext. 09/11/12 09:22
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	88		21-120
Phenol-d6	82		10-120
Nitrobenzene-d5	85		23-120
2-Fluorobiphenyl	85		15-120
2,4,6-Tribromophenol	105		10-120
4-Terphenyl-d14	90		33-120

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-04
 Client ID: B-9 (OW) NAVY LODGE
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 09/12/12 13:18
 Analyst: RC

Date Collected: 09/10/12 13:00
 Date Received: 09/10/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/11/12 12:51

TCLP/SPLP Ext. 09/11/12 09:22
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	89		21-120
Phenol-d6	81		10-120
Nitrobenzene-d5	85		23-120
2-Fluorobiphenyl	89		15-120
2,4,6-Tribromophenol	107		10-120
4-Terphenyl-d14	93		33-120

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-05
 Client ID: B-3 (OW) PF NORTH
 Sample Location: NEWPORT, RI
 Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 09/12/12 13:46
 Analyst: RC

Date Collected: 09/10/12 14:45
 Date Received: 09/10/12
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 09/11/12 12:51

TCLP/SPLP Ext. 09/11/12 09:22
 Date:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
TCLP Semivolatiles by EPA 1311 - Westborough Lab						
Hexachlorobenzene	ND		ug/l	10	--	1
2,4-Dinitrotoluene	ND		ug/l	25	--	1
Hexachlorobutadiene	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	10	--	1
Nitrobenzene	ND		ug/l	10	--	1
2,4,6-Trichlorophenol	ND		ug/l	25	--	1
Pentachlorophenol	ND		ug/l	50	--	1
2-Methylphenol	ND		ug/l	25	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--	1
2,4,5-Trichlorophenol	ND		ug/l	25	--	1
Pyridine	ND		ug/l	25	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	87		21-120
Phenol-d6	81		10-120
Nitrobenzene-d5	86		23-120
2-Fluorobiphenyl	85		15-120
2,4,6-Tribromophenol	107		10-120
4-Terphenyl-d14	97		33-120

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
Analytical Date: 09/12/12 10:33
Analyst: RC
TCLP Extraction Date: 09/11/12 09:22

Extraction Method: EPA 3510C
Extraction Date: 09/11/12 12:51

Parameter	Result	Qualifier	Units	RL	MDL
TCLP Semivolatiles by EPA 1311 - Westborough Lab for sample(s): 01-05 Batch: WG559986-1					
Hexachlorobenzene	ND		ug/l	10	--
2,4-Dinitrotoluene	ND		ug/l	25	--
Hexachlorobutadiene	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	10	--
Nitrobenzene	ND		ug/l	10	--
2,4,6-Trichlorophenol	ND		ug/l	25	--
Pentachlorophenol	ND		ug/l	50	--
2-Methylphenol	ND		ug/l	25	--
3-Methylphenol/4-Methylphenol	ND		ug/l	25	--
2,4,5-Trichlorophenol	ND		ug/l	25	--
Pyridine	ND		ug/l	25	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	82		21-120
Phenol-d6	76		10-120
Nitrobenzene-d5	80		23-120
2-Fluorobiphenyl	83		15-120
2,4,6-Tribromophenol	103		10-120
4-Terphenyl-d14	92		33-120

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Semivolatiles by EPA 1311 - Westborough Lab Associated sample(s): 01-05 Batch: WG559986-2 WG559986-3								
Hexachlorobenzene	97		85		40-140	13		30
2,4-Dinitrotoluene	105	Q	95		24-96	10		30
Hexachlorobutadiene	92		82		40-140	11		30
Hexachloroethane	91		77		40-140	17		30
Nitrobenzene	95		85		40-140	11		30
2,4,6-Trichlorophenol	104		94		30-130	10		30
Pentachlorophenol	110	Q	104	Q	9-103	6		30
2-Methylphenol	98		90		30-130	9		30
3-Methylphenol/4-Methylphenol	97		91		30-130	6		30
2,4,5-Trichlorophenol	101		92		30-130	9		30
Pyridine	28		39		10-66	33	Q	30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	97		90		21-120
Phenol-d6	94		86		10-120
Nitrobenzene-d5	95		84		23-120
2-Fluorobiphenyl	97		87		15-120
2,4,6-Tribromophenol	113		103		10-120
4-Terphenyl-d14	91		86		33-120

PETROLEUM HYDROCARBONS

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-01
Client ID: B-2 (OW) BISHOP ROCK
Sample Location: NEWPORT, RI
Matrix: Water
Analytical Method: 1,8015C(M)
Analytical Date: 09/11/12 22:07
Analyst: MW

Date Collected: 09/10/12 09:30
Date Received: 09/10/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/11/12 07:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/l	500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	43		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-02
Client ID: B-6 (OW) PF SOUTH
Sample Location: NEWPORT, RI
Matrix: Water
Analytical Method: 1,8015C(M)
Analytical Date: 09/11/12 22:07
Analyst: AR

Date Collected: 09/10/12 10:15
Date Received: 09/10/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/11/12 07:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/l	500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	48		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-03

Date Collected: 09/10/12 12:00

Client ID: B-12 (OW) DERECKTORS

Date Received: 09/10/12

Sample Location: NEWPORT, RI

Field Prep: Not Specified

Matrix: Water

Extraction Method: EPA 3510C

Analytical Method: 1,8015C(M)

Extraction Date: 09/11/12 07:59

Analytical Date: 09/11/12 22:39

Analyst: AR

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/l	500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	57		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-04
Client ID: B-9 (OW) NAVY LODGE
Sample Location: NEWPORT, RI
Matrix: Water
Analytical Method: 1,8015C(M)
Analytical Date: 09/11/12 20:00
Analyst: AR

Date Collected: 09/10/12 13:00
Date Received: 09/10/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/11/12 07:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/l	500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	77		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**SAMPLE RESULTS**

Lab ID: L1216093-05
Client ID: B-3 (OW) PF NORTH
Sample Location: NEWPORT, RI
Matrix: Water
Analytical Method: 1,8015C(M)
Analytical Date: 09/11/12 20:32
Analyst: AR

Date Collected: 09/10/12 14:45
Date Received: 09/10/12
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/11/12 07:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/l	500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	73		40-140

Project Name: NAVAL STATION NEWPORT**Lab Number:** L1216093**Project Number:** 5441.2.00**Report Date:** 09/14/12**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8015C(M)
 Analytical Date: 09/11/12 21:04
 Analyst: AR

Extraction Method: EPA 3510C
 Extraction Date: 09/11/12 07:59

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-05 Batch: WG559883-1					
TPH	ND		ug/l	500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	53		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Lab Number: L1216093

Project Number: 5441.2.00

Report Date: 09/14/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-05 Batch: WG559883-2								
TPH	88		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	86				40-140

Lab Duplicate Analysis
Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1216093

Report Date: 09/14/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG559883-3 QC Sample: L1216093-01 Client ID: B-2 (OW) BISHOP ROCK						
TPH	ND	ND	ug/l	NC		40

Surrogate	%Recovery Qualifier	%Recovery Qualifier	Acceptance Criteria
o-Terphenyl	43	45	40-140

METALS

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-01
 Client ID: B-2 (OW) BISHOP ROCK
 Sample Location: NEWPORT, RI
 Matrix: Water

Date Collected: 09/10/12 09:30
 Date Received: 09/10/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/11/12 09:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:12	EPA 7470A	1,7470A	AK
Selenium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:14	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-02
 Client ID: B-6 (OW) PF SOUTH
 Sample Location: NEWPORT, RI
 Matrix: Water

Date Collected: 09/10/12 10:15
 Date Received: 09/10/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/11/12 09:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:18	EPA 7470A	1,7470A	AK
Selenium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:26	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-03
 Client ID: B-12 (OW) DERECKTORS
 Sample Location: NEWPORT, RI
 Matrix: Water

Date Collected: 09/10/12 12:00
 Date Received: 09/10/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/11/12 09:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:20	EPA 7470A	1,7470A	AK
Selenium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:30	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-04
 Client ID: B-9 (OW) NAVY LODGE
 Sample Location: NEWPORT, RI
 Matrix: Water

Date Collected: 09/10/12 13:00
 Date Received: 09/10/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/11/12 09:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:25	EPA 7470A	1,7470A	AK
Selenium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:48	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

SAMPLE RESULTS

Lab ID: L1216093-05
 Client ID: B-3 (OW) PF NORTH
 Sample Location: NEWPORT, RI
 Matrix: Water

Date Collected: 09/10/12 14:45
 Date Received: 09/10/12
 Field Prep: Not Specified
 TCLP/SPLP Ext. Date: 09/11/12 09:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Arsenic, TCLP	ND		mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM
Barium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM
Cadmium, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM
Chromium, TCLP	ND		mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM
Lead, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/12/12 12:30	09/13/12 16:27	EPA 7470A	1,7470A	AK
Selenium, TCLP	ND		mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM
Silver, TCLP	ND		mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:51	EPA 3015	1,6010C	BM



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01-05 Batch: WG560213-1									
Mercury, TCLP	ND	mg/l	0.0002	--	1	09/12/12 12:30	09/13/12 16:07	1,7470A	AK

Prep Information

Digestion Method: EPA 7470A
TCLP/SPLP Extraction Date: 09/11/12 09:22

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01-05 Batch: WG560474-1									
Arsenic, TCLP	ND	mg/l	1.0	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM
Barium, TCLP	ND	mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM
Cadmium, TCLP	ND	mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM
Chromium, TCLP	ND	mg/l	0.20	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM
Lead, TCLP	ND	mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM
Selenium, TCLP	ND	mg/l	0.50	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM
Silver, TCLP	ND	mg/l	0.10	--	1	09/13/12 09:50	09/13/12 17:05	1,6010C	BM

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 09/11/12 09:22

Lab Control Sample Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Lab Number: L1216093

Project Number: 5441.2.00

Report Date: 09/14/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-05 Batch: WG560213-2								
Mercury, TCLP	101		-		80-120	-		
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-05 Batch: WG560474-2								
Arsenic, TCLP	108		-		75-125	-		20
Barium, TCLP	105		-		75-125	-		20
Cadmium, TCLP	106		-		75-125	-		20
Chromium, TCLP	100		-		75-125	-		20
Lead, TCLP	96		-		75-125	-		20
Selenium, TCLP	108		-		75-125	-		20
Silver, TCLP	96		-		75-125	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG560213-4 QC Sample: L1216093-01 Client ID: B-2 (OW) BISHOP ROCK												
Mercury, TCLP	ND	0.005	0.0068	136	Q	-	-		70-130	-		20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG560474-4 QC Sample: L1216093-01 Client ID: B-2 (OW) BISHOP ROCK												
Arsenic, TCLP	ND	1.2	1.4	117		-	-		75-125	-		20
Barium, TCLP	ND	20	21	105		-	-		75-125	-		20
Cadmium, TCLP	ND	0.51	0.56	110		-	-		75-125	-		20
Chromium, TCLP	ND	2	2.0	100		-	-		75-125	-		20
Lead, TCLP	ND	5.1	4.9	96		-	-		75-125	-		20
Selenium, TCLP	ND	1.2	1.3	108		-	-		75-125	-		20
Silver, TCLP	ND	0.5	0.51	102		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NAVAL STATION NEWPORT

Project Number: 5441.2.00

Lab Number: L1216093

Report Date: 09/14/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG560213-3 QC Sample: L1216093-01 Client ID: B-2 (OW) BISHOP ROCK						
Mercury, TCLP	ND	ND	mg/l	NC		20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG560474-3 QC Sample: L1216093-01 Client ID: B-2 (OW) BISHOP ROCK						
Arsenic, TCLP	ND	ND	mg/l	NC		20
Barium, TCLP	ND	ND	mg/l	NC		20
Cadmium, TCLP	ND	ND	mg/l	NC		20
Chromium, TCLP	ND	ND	mg/l	NC		20
Lead, TCLP	ND	ND	mg/l	NC		20
Selenium, TCLP	ND	ND	mg/l	NC		20
Silver, TCLP	ND	ND	mg/l	NC		20

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler

A Absent
 B Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1216093-01A	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-01B	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-01C	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-01D	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-01E	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-01F	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-01G	Plastic 500ml unpreserved	A	7	3	Y	Absent	-
L1216093-01H	Amber 1000ml unpreserved split	A	7	3	Y	Absent	TCLP-8270(14)
L1216093-01I	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-01J	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-01X	Amber 1000ml unpreserved split	A	7	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1216093-02A	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-02B	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-02C	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-02D	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-02E	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-02F	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-02G	Plastic 500ml unpreserved	A	7	3	Y	Absent	-
L1216093-02H	Amber 1000ml unpreserved split	A	7	3	Y	Absent	TCLP-8270(14)
L1216093-02I	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-02J	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-02X	Amber 1000ml unpreserved split	A	7	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)

*Values in parentheses indicate holding time in days

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1216093-03A	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-03B	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-03C	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-03D	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-03E	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-03F	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-03G	Plastic 500ml unpreserved	A	7	3	Y	Absent	-
L1216093-03H	Amber 1000ml unpreserved split	A	7	3	Y	Absent	TCLP-8270(14)
L1216093-03I	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-03J	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-03X	Amber 1000ml unpreserved split	A	7	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1216093-04A	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-04B	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-04C	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-04D	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-04E	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-04F	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-04G	Plastic 500ml unpreserved	A	7	3	Y	Absent	-
L1216093-04H	Amber 1000ml unpreserved split	A	7	3	Y	Absent	TCLP-8270(14)
L1216093-04I	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-04J	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-04X	Amber 1000ml unpreserved split	A	7	3	Y	Absent	CD-CI(180),AS-CI(180),BA-CI(180),HG-C(28),PB-CI(180),CR-CI(180),SE-CI(180),AG-CI(180)
L1216093-05A	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-05B	Vial unpreserved	A	N/A	3	Y	Absent	TCLP-EXT-ZHE(14)
L1216093-05C	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-05D	Vial HCl preserved split	A	N/A	3	Y	Absent	TCLP-VOA(14)
L1216093-05E	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-05F	Amber 1000ml unpreserved	A	7	3	Y	Absent	-
L1216093-05G	Plastic 500ml unpreserved	A	7	3	Y	Absent	-
L1216093-05H	Amber 1000ml unpreserved split	A	7	3	Y	Absent	TCLP-8270(14)
L1216093-05I	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)
L1216093-05J	Amber 1000ml unpreserved	A	7	3	Y	Absent	TPH-DRO-D(7)

*Values in parentheses indicate holding time in days



Project Name: NAVAL STATION NEWPORT**Project Number:** 5441.2.00**Lab Number:** L1216093**Report Date:** 09/14/12**Container Information**

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1216093-05X	Amber 1000ml unpreserved split	A	7	3	Y	Absent	CD-CI(180),AS-CI(180),BA- CI(180),HG-C(28),PB- CI(180),CR-CI(180),SE- CI(180),AG-CI(180)

*Values in parentheses indicate holding time in days

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report



Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

Data Qualifiers

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the reporting limit (RL) for the sample.

Project Name: NAVAL STATION NEWPORT
Project Number: 5441.2.00

Lab Number: L1216093
Report Date: 09/14/12

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certificate/Approval Program Summary

Last revised August 16, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. **NELAP Accredited Solid Waste/Soil.**

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Selenium, Silver, Sodium, Thallium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform -MF mEndo (SM9222B), Total Coliform – Colilert (SM9223, Enumeration and P/A), E. Coli. – Colilert (SM9223, Enumeration and P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform-EC Medium (SM 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, Orthophosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), CT-Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), E. Coli – Colilert (SM9223 Enumeration), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterococcus - Enterolert.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, CT-Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dieldrin, Dieldrin, 2,4-D, 2,4,5-T, 2,4,5-TP (Silvex), Dalapon, Volatile Organics (SW 8260), Acid Extractables (Phenols) (SW 8270), Benzidines (SW 8270), Phthalates (SW 8270), Nitrosamines (SW 8270), Nitroaromatics & Cyclic Ketones (SW 8270), PAHs (SW 8270), Haloethers (SW 8270), Chlorinated Hydrocarbons (SW 8270).)

Maine Department of Human Services Certificate/Lab ID: 2009024.

Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500CI-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H +B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500CI-D, 4500CI-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.

Drinking Water (Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd, Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM 4500CI-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,F e,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1, SM2510B, 2540C, 2340B, 2320B, 4 500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia -N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Ni trate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 53 10C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.

Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (CollertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B , EPA 200.7, 200. 8, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR- D, EPA 120.1, 300.0, 350.1, 350. 2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 90 10B, 9030B, 9040B, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 254 0C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D, 3060A. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, S W-846 8082, 8082A, 8081A, 8081B, 8151A, 8330, 8270C-SIM, 8270D-SIM.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 904 5C, 9050, 9065,1311, 1312, 3005A, 30 50B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3050B, 3580A, 3 630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8 151A, 8015B, 8015C, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9 223B, 9215B, 4 500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.1, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500 CI-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM 4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM2520B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 62 4, 625, SW-8 46 3630C, 5030B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6 010C, 6020, 6020A, 7196A, 3060A, 9 010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9040C, 9045C, 9045D, 9050A, 9065, 9251. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200. 7, 245.2, SM5310C, EPA 332. 0, SM2320B, EPA 300.0, S M2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222 B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, S M4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510 C, EPA 120.1, SM2510B, SM4500S -D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010 C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9040C, 9045D. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035A-H, 5035A-L.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. (Inorganic Parameters: SM2310B, 2320B, 4500Cl-E, 4500Cn-E, 9014, Lachat 10-204-00-1-X, 1010A, 1030, 4500NO3-F, 353.2, 4500P-E, 4500SO4-E, 300.0, 4500S-D, 5310B, 5310C, 6010C, 6020A, 200.7, 200.8, 3500Cr-B, 7196A, 245.1, 7471A, 7471B, 1311,1312. Organic Parameters: 608, 8081B, 8082A, 624, 8260B, 625, 8270D, 8151A, 8015C, 504.1, MA-EPH, MA-VPH.)

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. *NELAP Accredited.*
Drinking Water (Inorganic Parameters: 200.7, 200.8, 245.2, 300.0, 332.0, 2120B, 2320B, 2510B, 2540C, 4500-CN-CE, 4500F-C, 4500H+-B, 4500NO3-F, 5310C. Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1312, 3005A,3015, 3060A, 200.7, 200.8, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE, 245.1, 300.0, 3501., 350.2, 353.2, 420.1, 6010B, 6010C, 6020, 6020A, 7196A, 7470A, 9010B, 9030B, 9040B, Lachat 10-107-06-2-D, NJ-EPH, 2120B, 2310B, 2320B, 2340B, 2510C, 2540B, 2540C, 3500Cr-D, 436C, 4500CN-CE, 4500Cl-E, 4500F-B, 4500F-C, 4500H+-B, 4500NO2-B, 4500NO3-F, 4500S-D, 4500SO3-B, 5310BCD, 5540C. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330, 8015B,)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3005A, 3050B, 3060A, 6010B, 6010C, 6020A, 7196A, 7471A, 7471B, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-BH, 9030B, 9038, 9251. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, NJ-EPH.)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. *NELAP Accredited via NJ-DEP.*

Refer to MA-DEP Certificate for Potable and Non-Potable Water.

Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commission on Environmental Quality Certificate/Lab ID: T104704476-09-1. *NELAP Accredited.*

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S²⁻D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. *NELAP Accredited.*

Drinking Water (Inorganic Parameters: EPA 200.7, 200.8, 300.0, 2510B, 2120B, 2540C, 4500CN-CE, 245.2, 2320B, 4500F-C, 4500F-C, 4500NO3-F, 5310C. Organic Parameters: EPA 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 200.7, 200.8, 245.1, 300.0, 3005A, 3015, 1312, 6010B, 6010C, 3060A, 353.2, 420.1, 6020, 6020A, SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X, 7196A, 7470A, 9010B, 9040B, 2310B, 2320B, 2510B, 2540B, 2540C, 3500Cr-D, 426C, 4500Cl-E, 4500F-B, 4500F-C, 4500PE, 510AC, 5210B, 5310B 5310C, 5540C. Organic Parameters: EPA 3510C, 3630C, 5030B, 8260B, 608, 624, 625, 8081A, 8081B, 8082, 8082A, 8151A, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330,)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010A, 1030, 3060A, 3050B, 1311, 1312, 6010B, 6010C, 6020, 7196A, 7471A, 7471B, 6020A, 9030B, 9010B, 9012A, 9014 9040B, 9045C, 9050A, 9065. Organic Parameters: EPA 5035, 3540C, 3546, 3550, 3580, 3630C, 8260B, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.

Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:

EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl na phthalene, Dimethyl naph thalene, Total Methylnaphthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4 -Chloroaniline, 4-Methylphenol. Tot al Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO₂ in a soil matrix, NO₃ in a soil matrix, SO₄ in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease.



CHAIN OF CUSTODY

PAGE 1 OF 1

WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Project Information

Project Name: Naval Station NewportProject Location: Newport, R-I.Project #: 5441.2.00Project Manager: JWP

ALPHA Quote #:

Turn-Around Time

 Standard RUSH (only confirmed if pre-approved!)
Date Due: 9/14/12 Time:

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All CAM methods for inorganic analyses require MS every 20 soil samples)

Date Rec'd in Lab: 9/10/12ALPHA Job #: L1210093

Report Information - Data Deliverables

 FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

 Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program RI Criteria DEM

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

 Yes No Are MCP Analytical Methods Required?
 Yes No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
 Yes No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS	SAMPLE HANDLING				TOTAL # BOTTLES
	Filtration	Done	Not needed	Lab to do Preservation	
TCLP RCRA-8					
TCLP RCRA-8					
TPH-DRO-D					
TCLP-DRO-D					

Client Information

Client: Michael Assoc LLCAddress: 2269 Mass Ave
Cambridge, MAPhone: 617-868-1420Fax: 617-868-1423Email: JPatch@michaelassoc.com
 These samples have been previously analyzed by Alpha

ALPHA Lab ID (Lab Use Only)

Sample ID

Collection

Date

Time

Sample Matrix

Sampler's Initials

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS	Filtration	Done	Not needed	Lab to do Preservation	Lab to do	TOTAL # BOTTLES
	1 B-2 (cow) Bishop Rock	9/10/12	930	420	Tire	TCLP RCRA-8						7
	2 B-6 (cow) PF South		1015			TCLP RCRA-8						2
	3 B-12 (cow) Derecktors		1200			TPH-DRO-D						7
	4 B-9 (cow) Navy Lodge		1300			TCLP-DRO-D						2
	5 B-3 (cow) PF North		1445			TCLP-DRO-D						2

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type

Preservative

P A A U

A A A A

Relinquished By:

Date/Time

Received By:

Date/Time

9/10/12 16309/10/12 18109/10/12 17059/10/12 1810

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Serial No: 09141218:29

**Appendix B
Survey Report and
Topographic Survey Site Plans**

Surveyor's Report

Topography and Site Utility Survey

Naval Station Newport

Newport, Rhode Island

September 19th, 2012

Prepared by

Green Seal Environmental

114 State Rd. Bldg B.

Sagamore Beach, MA 02562



Contents

- 1. Project Narrative**
- 2. Horizontal and Vertical Datums**
- 3. Control Recovered**
- 4. Control Set**
- 5. Equipment and Methodology**
- 6. Control Coordinates**

Project Narrative

Green Seal was retained by CH2M Hill to provide topographic surveys and geotechnical investigation of seven proposed wind turbine sites located at Naval Station Newport, Rhode Island. The field work performed included control surveys, topographic surveys and utility mapping at each site. The limits of the surveys were identified by the Project Manager at a site visit on July 30, 2012.

GPS Control Surveys were performed to establish horizontal and vertical control and the topographic surveys were performed with a robotic total station.

Horizontal and Vertical Datums

The horizontal datum used is the North American Datum of 1983 (NAD83) and coordinates are based on the Rhode Island State Plane Coordinate System in U.S. Survey Feet.

The vertical Datum used is the North American Vertical Datum of 1988 (NAVD88). Elevations of the control points were converted from the GRS80 ellipsoid to orthometric heights using Geoid 09.

Control Recovered

A search of the National Geodetic Survey (NGS) database of survey control marks was performed and eight potential candidates for control were identified. In addition, the Project Manager obtained descriptions of three marks, two of which, GG3 and P28 were listed by NGS. The third, CP18 appears to be a local tidal benchmark. A search of the NOAA Tidal benchmark database was performed and no mark matching its description was found. Two of the eight marks were recovered. The marks identified and their status is shown in the following table:

Sta. Name	NGS PID	Status	Notes
RAPOSO	LW2375	Not Found	Probably Destroyed, area is now parking lot
GG 3	LW 2375	Not Found	Probably Destroyed, area currently under construction
H3	LW0484	Not Found	Area does not match description, roadways reconfigured
J3	LW0487	Not Found	Reported Destroyed, roadway reconfigured
N28	LW0485	Not Found	Ties to Road Centerlines that no longer exist
RAPOSA	LW0272	Not Found	Location plots in the water
P28	LW0486	Found	Occupied with GPS
CP18	Local	Found	Located by GPS and Total Station

The two recovered control marks were tied into using GPS, and CP18 was also located by total station. The published and observed elevations are summarized in the following table:

Sta. Name	Published Elevation	Measured Elevation	Difference
P28	5.87	5.51	-0.36
CP18	10.40*	7.02	-3.38
* Converted from provided MLW elevation of 9.82 to NAVD88 using difference of 0.58 from the Newport Tidal Station (No. 8452660)			

Based on the above results, we determined that CP18 is not a viable control point. Station P28 is a Second Order, Class O vertical control monument.

Control Set

Primary control points were established at each site, consisting of either 5/8 x 30" rebar or drill holes set in concrete pads or in boulders. With the exception of the NUWC site, these primary points were set so as to be visible from at least one other site, so that a total station could use the primary control point on an adjacent site as a backsight. The shortest of these backsight lines was 833 feet.

Two secondary control points were established from the primary control point at each site using a robotic total station.

Equipment and Methodology

Primary RTK GPS observations were performed with a Lieca GS 15 GPS Receiver and CS15 Data Collector connected to the Maine Technical Source RTK base station at Rumford RI. The receiver was set to collect observations on these points until it had achieved a horizontal position standard deviation of 0.05 and a vertical standard deviation of 0.05. Based on our shortest baseline length of 833 feet, this would provide horizontal accuracy of at least 1:16,660. Subsequent observations performed one week and five weeks later confirmed the accuracy of our initial observations. An additional quality control check was performed by submitting the raw GPS observations on point 1 to the NGS Online Positioning User Service (OPUS) for post processing. The resultant positional accuracy of +/- 0.056 was within of 0.065 our initial RTK position.

Secondary control was established with a Lieca TPS 1200 robotic total station with a horizontal and vertical angle accuracy of 5 seconds, and a distance accuracy of 5mm + 2ppm. The total station was placed over a primary control point and a backsight was taken from another primary control point. Five sets of direct and reverse observations were performed on each secondary control point and the results averaged.

The topographic surveys were performed with the same Leica total station. A graduated prism pole was used and the rod height recorded for all topographic locations. Ground penetrating radar (GPR) was used to detect subsurface objects. These were flagged by the radar operator and located by the survey crew. Above ground evidence of utilities was collected during the topographic survey and this evidence, the GPR data, and utility plans provide by NAVFAC was used to compile as complete a picture of the utilities on site as possible. It should be noted that the capabilities of the GPR equipment are limited to a depth of approximately six feet. Any structures buried deeper than that may be present but not detected.

Control Coordinates

Point	Northing	Easting	Elevation	Description
1	158456.7110	374629.5850	7.749	DH SET
2	158886.7970	375389.6700	8.217	DH SET
3	158223.4500	375429.3360	5.958	DH SET
4	159998.6890	376258.0140	30.956	BOLT FND
5	159095.6640	378403.4900	5.218	DH SET
6	160903.6930	379721.8950	13.469	PK SET
8	165151.1590	380863.5790	46.564	PK SET
9	165249.7190	380677.0680	45.489	PK SET
10	165457.7200	380732.6340	39.011	PK SET
11	158848.4459	375473.9148	9.101	DH SET
12	159023.7513	375391.6022	10.247	DH SET
13	158311.7523	375364.4124	4.718	REBAR SET
14	158248.0419	375542.2980	5.653	REBAR SET
15	158334.7231	375736.5429	7.018	BRASSSCREW
20	156328.6820	376739.4590	5.510	DISK FND
182	160890.8874	379777.1751	14.715	PK FND
183	160921.5682	379842.2938	16.630	PK FND
501	158347.8791	374539.9147	7.559	DH SET
502	158468.4550	374528.0437	7.332	DH SET

Appendix C

**Government-Furnished Geotechnical Investigation of
Anomaly Locations Identified in Site Surveys**

US Navy Further Geotechnical Investigation of Anomaly Locations identified in Site Surveys

20 NOV 2012

G. Ormiston PE
D Sullivan PE

Fran Furtado, Luis Gonzalez, Jason Williams

REFERENCE: Site survey and Boring location Plans

Navy Lodge Site (Sheet 5 of 7)

Two pits were dug, each to about 4'-6" deep. No obvious obstructions were located. Traces of cobbles, brick and possibly concrete were observed. Groundwater (possibly due to tidal influence) was observed at the bottom of the pits. A distinct change in soil make-up was observed at approximately the 3 ft in depth mark where sea shells and peat-type material was encountered. This may possibly be the cause of the anomaly signal in the GPR survey. No petroleum or other type smell was observed.

Bldg 1112 Coddington Point Site (Sheet 4 of 7)

Three test pits were dug to approx 12" deep. One pit had three wires in it, two were similar to grounding wires, the third was a copper wire with a black sheath. All three ran together and were of small diameter – approx 1/8 to 1/4 inch in dia oriented in the east-west direction about 8 inches below grade. The source and destination of the wires were undetermined.

The pits had traces of brick, and ledge. No petroleum or other type smell was observed.

Pritchard Field North Site (Sheet 3 of 7)

One large test pit was dug to approx 3.5' to 4' deep. No obvious obstructions were located except for some large rocks at about the 4 ft depth mark. Traces of cobbles, brick and several of the large stones/boulders were observed. Differences in soil make-up were also observed (sand). No petroleum or other type smell was observed.