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NWIRP CALVERTON  
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FINAL WORK PLAN FOR INSTALLATION WATER SERVICE TO PECONIC RIVER  
SPORTSMANS CLUB WITH TRANSMITTAL NWIRP CALVERTON NY  
4/26/2012  
SES-TECH ATLANTIC

CONTRACT NO. <b>N40085-11-D-0043</b>	CONTRACT TASK ORDER NO. <b>0002</b>	ACTIVITY LOCATION <b>Naval Weapons Industrial Reserve Plant, Calverton, NY</b>
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PROJECT TITLE:  
**Peconic River Sportsman's Club Water Service Installation**

FROM: <b>SES-TECH Atlantic: Project Manager, Stavros Patselas</b>	DATE April 26, 2012
TO: <b>Lora Fly (2 CDs and 1 hardcopy)</b>	DATE April 26, 2012

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ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/ SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
1	SD-08, Statements; Final Work Plan For Installation Of Water Service To Peconic River Sportsman's Club	Helene Conlan			

# SES-TECH Atlantic

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April 26, 2012  
File: SESTECH-RAO/LTM-12-0030

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**SUBJECT: FINAL WORK PLAN FOR INSTALLATION OF WATER SERVICE TO  
PECONIC RIVER SPORTSMAN'S CLUB  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, CALVERTON, NY  
TASK ORDER NO. 0002 FOR US NAVY CONTRACT NO. N40085-11-D-0043**

Dear Ms. Fly:

Enclosed is the *Final Work Plan For Installation of Water Service To Peconic River Sportsman's Club, Naval Weapons Industrial Reserve Plant, Calverton, NY*. This work will be completed under Remedial Action Operations (RAO)/Long Term Management (LTM), Environmental Multiple Award Contract (EMAC) No. N40085-11-D-0043, Task Order No. 0002.

Please do not hesitate to contact me with any questions regarding this document at office phone # 215-702-4099 or via email [stavros.patselas@tetrattech.com](mailto:stavros.patselas@tetrattech.com).

Sincerely,



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**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC  
REMEDIAL ACTION OPERATIONS (RAO)/LONG TERM MANAGEMENT (LTM)  
ENVIRONMENTAL MULTIPLE AWARD CONTRACT (EMAC)  
CONTRACT NO. N40085-11-D-0043  
TASK ORDER NO. 0002**

**FINAL  
WORK PLAN  
FOR  
INSTALLATION OF WATER SERVICE TO PECONIC RIVER SPORTSMAN'S CLUB  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT  
CALVERTON, NEW YORK**

*Issued:*

April 26, 2012

*Prepared for:*

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DCN: SESTECH-RAO/LTM-12-0030

Revision  
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## LIST OF ACRONYMS

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
bgs	Below Ground Surface
BMPs	Best management practices
CCR	Construction Completion Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMP	Complete Manifest Package
CMT	Construction Management Technician
COC	Chain-of-Custody
CPM	Critical Path Method
CQC	Contractor Quality Control
CRF	Change Request Form
DFW	Definable Features of Work
DoD	Department of Defense
DOT	Department of Transportation
EE/CA	Engineering Evaluation
ELAP	Environmental Laboratory Accreditation Program
EMAC	Environmental Multiple Award Contract
FAR	Federal Acquisition Regulation
FEAD	Facilities Engineering and Acquisition Division
GAC	Granular Activated Carbon
ID	Inner Diameter
LTM	Long Term Monitoring
MCLs	Maximum Contaminant Levels
MSDS	Material Safety Data Sheets
NAVFAC Mid-Atlantic	Naval Facilities Engineering Command Mid-Atlantic
Navy	United States Department of the Navy
NEDD	NIRIS Electronic Data Deliverable
No.	Number
NTCRA	Non-Time Critical Removal Action
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
PE	Polyethylene
PESM	Project Environmental Safety Manager
PM	Project Manager
PMO	Project Management Office
POE	Point-of-Entry
PPE	Personal Protective Equipment
PQCM	Project Quality Control Manager
PRSC	Peconic River Sportsman's Club
QACP	Quality Assurance and Control Plan

QA/QC	Quality Assurance/Quality Control
QC	Quality Control
QCPM	Quality Control Program Manager
RAO	Remedial Action Operation
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
RI	Remedial Investigation
RPM	Remedial Project Manager
RPZ	Reduced Pressure Zone
SAP	Sampling and Analysis Plan
SES	Sealaska Environmental Services, LLC
SES-TECH	SES-TECH Atlantic
SS	Site Superintendent
SSDHS	Suffolk County Department of Health Services
SSHO	Site Safety and Health Officer
SOW	scope of work
SSHP	Site Safety and Health Plan
SWPPP	Storm Water Pollution Prevention Plan
T&D	Transportation and disposal
TAL	Target Analyte List
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TCL	Target Compound List
TO	Task Order
TOX	total organic hallogens
TtEC	Tetra Tech EC, Inc.
µg/	Microgram per liter
VOC	volatile organic compound
WMP	Waste Management Plan
WWTF	Waste Water Treatment Facility

## 1.0 INTRODUCTION

SES-TECH Atlantic (SES-TECH) has prepared this Work Plan for the installation of a municipal potable water service line for the Peconic River Sportsman's Club (PRSC), located at the Naval Weapons Industrial Reserve Plant (NWIRP) in Calverton, New York. This Work Plan has been prepared by SES-TECH, a joint venture between Sealaska Environmental Services, LLC (SES) and Tetra Tech EC, Inc. (TtEC) under the Naval Facilities Engineering Command Mid-Atlantic (NAVFAC Mid-Atlantic) Remedial Action Operation (RAO) Long Term Monitoring (LTM) Environmental Multiple Award Contract (EMAC), Contract Number (No.) N40085-11-D-0043, Task Order (TO) No. 0002.

### 1.1 Work Plan Organization

The Work Plan for the PRSC Site is organized as follows:

- **Section 1.0: Introduction** – Provides an overview of the project and describes how the Work Plan is organized.
- **Section 2.0: Site Conditions and Background** – Presents the site location, conditions and background.
- **Section 3.0: Regulatory Framework** – Presents the regulatory framework which determines the Non-Time Critical Removal Action (NTCRA) and other site actions.
- **Section 4.0: Project Requirements** – Presents the project objective and the scope of work (SOW) for the NTCRA.
- **Section 5.0: Project Management Plan and Project Schedule** – Presents the management approach and the project schedule to complete the NTCRA.
- **Section 6.0: Pre-Construction Activities** – Presents details on project and site preparation activities to be completed prior to start of site work.
- **Section 7.0: Site Work** – Presents a summary of the activities to be performed as part of the planned NTCRA.
- **Section 8.0: Site Restoration** – Presents the details on site restoration activities.
- **Section 9.0: Construction Completion Report Requirements** – Presents a summary of activities to be performed after the completion of site activities.
- **Section 10.0: Sampling and Analysis Plan** – Presents details on sample collection and laboratory analysis.
- **Section 11.0: Waste Management Plan** – Provides practices and procedures to be followed for the types and quantities of waste expected to be generated.
- **Section 12.0: Quality Assurance and Control Plan** – Presents details on the quality assurance program with specific information as to the implementation of the NTCRA.
- **Section 13.0: References** – Includes a list of documents used to prepare the Work Plan.

## **2.0 SITE CONDITIONS AND BACKGROUND**

The following sections present the site conditions and background relative to the PRSC Site. The information was provided by the United States Department of the Navy (Navy) to SES-TECH. Figure 1 of this Work Plan is the Site Location Map. Figure 2 is the Site Layout Map of the PRSC site.

### **2.1 Site Description and Location**

The Southern Area begins within NWIRP boundaries to the southeast of Site 10B (Engine Test House) and extends off site to the southeast (see Figure 2). This area is hydraulically down-gradient of Site 10B, Site 6A (Fuel Calibration Area), and the general industrial complex at the facility. Groundwater flow through this area is to the southeast, with the Peconic River being the discharge point.

The Southern Area is mostly wooded and includes two shallow ponds near the northern edge. The ponds receive runoff through a drainage swale and culvert from Site 6A. From the late 1980s to the early 1990s, groundwater from Site 6A was discharged into this drainage swale and culvert and into the western pond. As a result, the presence of chlorinated volatile organic compound (VOC)-contaminated groundwater in the Southern Area may be attributable to Site 6A.

The PRSC is located at the southern end of the Southern Area plume. PRSC is located off of River Road in Manorville, NY. It is located along the banks of Donahue Pond that was created by a dam across the Peconic River. PRSC includes a Main Lodge, Activities Center, a private residence, and pistol, rifle, and archery ranges. Three individual wells provide water to the Main Lodge, Activities Center, and the private residence. A well at the pistol range was shut down because of VOC contamination. Fire protection is provided by a fifth high capacity well.

### **2.2 Current Site Conditions**

As noted previously, PRSC includes a Main Lodge, Activities Center, a private residence, and pistol, rifle, and archery ranges. Main Lodge, Activities Center, and the private residence each have an individual well. Because of groundwater contamination, the well at the Activities Center is provided with a Point-of-Entry (POE) Granular Activated Carbon (GAC) system. A well at the pistol range trailer has been shut down because of VOC contamination. Fire protection is provided by a fifth high capacity well.

Contaminants that have been detected in PRSC wells include 1,1-DCA, and 1,1-DCE. The concentration of these contaminants is greater than the New York State Department of Health (NYSDOH) (2007) Maximum Contaminant Levels (MCLs) of 5µg/L.

Because of the potential exposure to groundwater contamination at PRSC, alternative groundwater supplies need to be evaluated. Because the fire protection well is only used intermittently and does not present an unacceptable human health exposure risk, no action is proposed for the fire protection well.

### **2.3 Site Environmental Conditions**

The following sections detail the environmental conditions of the PRSC Site.

#### **2.3.1 Vegetation**

The area surrounding the Southern Area supports a grassy turf dominated by upland grasses such as fescues (*Festuca* sp.), panic grass (*Panicum lanuginosum*), and broomsedge (*Andropogon virginicus*), and

weedy forbs such as yellow sweet clover (*Melilotus officinalis*), pigweed (*Amaranthus retroflexus*), raspberry (*Rubus* sp.), and plantain (*Plantago lanceolata*). This area was frequently mowed until 1996 while NWIRP Calverton was in active operation, but the grass has been allowed to grow to seed since then. The weedy forbs are typical of lawns and likely were present even when the area was frequently mowed, but their coverage has likely been expanding since 1996.

A narrow strip of oak-pine forest is located southeast of the Southern Area. This forest is typical of course-textured upland soils. It is dominated by oaks (primarily scarlet oak, *Quercus coccinea*, and white oak, *Quercus alba*) and pitch pine (*Pinus rigida*), with a dense shrubby understory of early low blueberry (*Vaccinium vacillans*).

The land overlying the off-site portion of the Southern Area plume between the facility and PRSC is undeveloped and forested. Trees have been thinned in the immediate vicinity of PRSC for roads and parking. Two areas have been cleared for the pistol range and rifle range. The types of vegetation in this area have not been categorized.

### 2.3.2 Wetlands

There are two shallow ponds on-site and the northwest end of the Southern Area plume. There is a wetland mapped along the southern side of the off-site plume between Swan Pond and the PRSC pond. Another wetland branches off from this to the north near the eastern side of River Road, terminating near the NWIRP boundary. Another wetland is mapped on the eastern side of the PRSC access road. Additional wetlands are mapped along the northern side of the perimeter road near well cluster MW-126. The PRSC pond and Peconic River are mapped wetlands.

### 2.3.3 Wildlife

According to the United States Department of the Interior, Fish and Wildlife Service, no federally listed endangered or threatened species reside within a 4-mile radius of the study area. Transient individuals of endangered species such as the Bald Eagle (*Haliaeetus leucocephalus*) may inhabit the study area.

Information provided by New York State Department of Environmental Conservation (NYSDEC) and the New York Natural Heritage program indicated that several New York State endangered and threatened animal species exist within the Southern Area. The most notable, tiger salamander (*Ambystoma tigrinum*), may reside on site in the ponds adjacent to Site 6A. Other species include the northern cricket frog (*Acris crepitans*) and the least tern (*Sterna antillarum*). Additional endangered and threatened plant species inhabit the Calverton facility boundary and may be present in the Southern Area. According to the information supplied by NYSDEC, the wetland areas surrounding the Peconic River, including Swan Pond, include significant habitat for many State endangered and threatened animals and plants. Portions of these wetland areas would be within the off-site portion of the Southern Area plume (TtNUS, 2006).

### 2.3.4 Geology

The geology at NWIRP Calverton consists of a mixture of sandy and clayey deposits. The upper 120 to 130 feet of subsurface materials consist primarily of fine to medium sand, with thin to thick clayey layers also interbedded within the predominantly sandy deposits.

Minor amounts of fill, consisting primarily of a mixture of sand, silt, and clay, were also found at shallow depths (0 to 6 feet) in some areas. From this depth to approximately 60 feet below ground surface (bgs), fine to medium sand is present. A silty clay layer was encountered at depths of approximately 60 to

90 feet across the site. In the off-site portion of the Southern Area plume, this clay unit appears to pinch out since it was not encountered in the borings drilled near the Peconic River. Underlying this silty clay unit is approximately 40 feet of fine to medium sand. Another silty clay unit was encountered from 130 to 180 feet bgs. This unit appears to be continuous throughout the area.

The geologic units encountered within the study area appear to be generally flat lying, consistent with what would be expected for the glacial deposits on Long Island. The upper contact of the Magothy Formation, being an erosional surface, is expected to be flat lying to undulating, reflecting the former topography, even though the formation itself is known to dip to the south.

### 2.3.5 Hydrogeology

During the Phase 2 Remedial Investigation (RI) (TtNUS, 2001), a focused groundwater investigation was performed in the Southern Area to determine whether the Peconic River was the discharge point for contaminated groundwater (to a depth of 100 feet bgs) that migrated from the facility, or conversely whether some groundwater bypassed the river and migrated to areas further south. The study involved the installation of several well clusters on both sides of the river and in the immediate vicinity of the river, the installation of two staff gauges in the river, and the collection of four rounds of water level data from the wells and staff gauges. Potentiometric surface interpretations based on water level data from the well clusters indicated that the river is the ultimate groundwater discharge point in this area. This was determined since the water levels along the river were lower than water levels for both shallow and deep wells in well clusters located several hundred feet from the river on both sides. Groundwater in the study area was found to be migrating east-southeast towards the river, while on the opposite side of the river, the groundwater flow direction is generally northward towards the river.

Additional groundwater data were collected in 2005 to refine the information collected for the Phase 2 RI. Groundwater was encountered at approximately 10 feet bgs in the off-site portion of the Southern Area plume. Based on the interpretation of the data collected, any groundwater contamination that may reach the Peconic River is expected to discharge to the river and not migrate beyond it to the south.

There are several drinking water wells located at PRSC. The nearest public water supply well is located approximately 0.5 mile west of the PRSC.

## 2.4 Project Background

In 2001, routine monitoring of PRSC water supplies by Suffolk County Department of Health Services (SCDHS) detected chlorinated solvent-type VOCs in one of the wells on the PRSC property. Based on these detections, the well at the Pistol Range Trailer was shut-down and PRSC installed a granular activated carbon treatment system on the water supply well for the Activity Center in 2007. The other public water supply well (main lodge) at the site was not affected. Based on direction from SCDHS, PRSC started quarterly sampling and analysis of the wells. Private residence and fire suppression wells are also present at the PRSC. In January 2008, the Navy started quarterly sampling and analysis of the four active wells, including sample taps on the granular activated carbon treatment system. Contaminants detected on the PRSC property are consistent with those detected at Site 6A - Southern Area. 1,1,1-trichloroethane (TCA) and associated degradation products 1,1-dichloroethane (1,1-DCA) and 1,1-dichloroethene (1,1-DCE). Groundwater at Site 6A – Southern Area flows in the direction of the PRSC. In addition, trichloroethene (TCE), TCA, and related degradation products are present in the McKay permitted outfall and may flow into this area. There are no known or suspected contaminant sources of chlorinated VOCs within PRSC area.

#### 2.4.1 Previous Removal Actions and Relevant Information from Prior Investigations

Investigations of contamination at Sites 6A and 10B lead toward the southeast and prompted investigations of the Southern Area. In 1985 to 1986, the Navy conducted an IAS for Calverton and identified Site 6A as a potential area of concern. In 1987, a groundwater and free product extraction (floating petroleum) system was installed to collect floating free product on the water table. Groundwater and free product extraction continued until 1993. Passive free product recovery continued until 1996 and was then restarted in 2000.

The Navy conducted a SI at Calverton in 1991 to 1992 and confirmed the presence of contamination and recommended that a RI be conducted to delineate the nature and extent of contamination. A RI was conducted at Site 6A from 1994 to 1995. From 1997 to 1998, the Navy conducted a Phase 2 RI at Site 6A. Specific areas addressed included deep groundwater onsite, groundwater at the Engine Test House Area (Site 10B), groundwater near the southern fence and off-site groundwater near the Peconic River

#### 2.4.2 Remedial investigation and Supplemental Investigation Results

The Southern Area is characterized by VOC-contaminated groundwater down-gradient of Sites 6A and 10B. The groundwater contamination in the Southern Area is believed to have resulted from either intermittent releases at Sites 6A and 10B or from potential overland migration through a series of ditches and ponds in the area. The area was investigated during the Phase 2 RI (TtNUS, 2001) and the Site 6A and Southern Area Supplemental Investigation (TtNUS, 2005a). The investigations were conducted in 1997, 2000, and 2004/2005, and groundwater samples were collected from temporary wells, piezometers, and vertical profile borings during the investigations. The results of the groundwater investigation are summarized below.

The groundwater contaminants in the Southern Area plume consisted of chlorinated VOCs. Other VOCs, including fuel-type chemicals (benzene, toluene, ethylbenzene, and xylene) and other miscellaneous organics are detected periodically. Similar contaminants were detected in groundwater at Site 6A, Site 10B, and the On-Site Southern Area Plume.

Contaminants detected during all three rounds of sampling at the off-site portion of the Southern Area plume included TCA, 1,1-DCA, DCE, and chloroform. Nine contaminants were detected in excess of groundwater quality standards including TCA, 1,1-DCA, 1,2-DCA, 1,2-DCE, cis-1,2-dichloroethene benzene, chloroethane, toluene, and total xylenes. 1,1-DCA was the dominant VOC present in the groundwater, and it was detected at a maximum concentration of 292 micrograms per liter ( $\mu\text{g/L}$ ) (SA-VPB-114 at 92 feet bgs) in 2004 (TtNUS, 2005). Maximum concentrations of the other contaminants were one to two orders of magnitude lower than the 1,1-DCA maximum concentration. Most of the contaminants detected at concentrations greater than groundwater standards were detected in samples collected near the pistol range area at the PRSC and along Connecticut Avenue (e.g., SA-TW-108, SA-TW-113, SA-VPB-114, and SA-PZ-123I).

The off-site portion of the plume is approximately 92 acres (3,991,000 square feet). VOC contamination was generally detected at depths of 60 feet to 90 feet bgs. At 130 feet bgs, there is a silty clay unit that prevents deeper migration of contamination. Using a contaminated aquifer thickness of 30 feet, the area of the plume (92 acres), and a porosity of 0.25, the volume of contaminated groundwater is estimated to be 224 million gallons. The total masses of chlorinated VOC and other VOC contamination in the Off-Site Southern Area Plume were estimated to be 670 pounds and 120 pounds, respectively (TtNUS, 2006).

The concentrations of contaminants detected in PRSC wells were compared to NYSDOH MCLs. 1,1-DCA was detected in one well at concentrations greater than the MCL (5 µg/L). 1,1-DCE was detected one time at a concentration equal to the MCL (5 µg/L); all other detections were less than the MCLs.

### **3.0 REGULATORY FRAMEWORK**

Site 6A and the on-site portion of the Southern Area are located on property held by the Navy. Historical activities from Site 6A resulted in contamination migrating off-site (to the off-site Southern Area). Subsequently, the Navy holds responsibility for removal actions, risk reduction, and remediation of the on-site and off-site plume. NWIRP Calverton is identified on the New York State List of Inactive Hazardous Waste Sites and is also regulated under a Resource Conservation and Recovery Act (RCRA) Permit (i.e., under corrective actions portions of the NYSDEC “373 permit”). NYSDOH and NYSDEC provide oversight of actions and review of documents for sites under the ERP (including the Off-Site Southern Area).

The Navy performed an engineering evaluation and cost analysis (EE/CA) in 2009 to evaluate removal action alternatives to mitigate potential risk from exposure to VOCs in groundwater (Tetra Tech, 2009a). The EE/CA recommended the extension of a municipal water line to the PRSC vicinity and direct service lines to PRSC facility.

An Action Memorandum was prepared in May 2010 to document the decision of the Navy to install a municipal potable water supply to the off-site portion of Site 6A – Southern Area, NWIRP. NTCRA will eliminate human health risks associated with exposure to VOCs in groundwater within the Off-Site Southern Area, including the PRSC facility. No post-removal site controls will be required following this NTCRA respective to potable water supply (whereas separate efforts to address the Southern Area VOC groundwater plume, itself, are ongoing). The Southern Area VOC groundwater plume is believed to originate from Site 6A (ongoing investigation).

As a part of this NTCRA, the existing Riverhead Water District water main was previously extended to the east so that potable water service can be provided to current (i.e., PRSC) and future occupants. A 12-inch diameter ductile iron water line was extended 5,000 feet from its current termination to a point approximately 50 feet east of the PRSC access road. A valve was installed at the new pipeline termination to allow for future expansion of the system.

The NTCRA also consists of water service line connection for PRSC to the new water supply main near the PRSC access road or driveway. The water service line installation at the PRSC facility is covered under this Work Plan. The water service line will extend from the RPZ vault installed near River Road approximately 1,500 feet adjacent to the PRSC driveway. From there, individual water pipes will branch off to each building currently or formerly supplied with well water (i.e., Main Lodge, Activities Center, residence, and pistol range trailer). This NTCRA is being conducted by the Navy under the RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulatory frameworks with oversight by the NYSDEC.

### **4.0 PROJECT REQUIREMENTS - PROJECT OBJECTIVES AND SCOPE OF WORK**

The following sections present the project objectives and the SOW for the PRSC facilities (the PRSC Site).

#### **4.1 Project Objectives**

The objective of the construction activity is to install a water service line at the PRSC Site. This NTCRA will eliminate human health risks associated with exposure to VOCs in groundwater within the Off-Site Southern Area, including the PRSC facility. Because of the potential exposure to groundwater contamination from the groundwater wells at PRSC, an alternative potable water supply is needed. Water service installation work will be performed while not disrupting PRSC operations including driveway traffic.

The PRSC Site soils are considered to be free of contamination and all soil work will be conducted as utilizing clean construction protocols and methodologies. The potential to encounter contaminated groundwater will occur during the abandonment of four of the groundwater supply wells currently servicing PRSC facilities.

#### **4.2 Scope of Work**

Specifically, the following SOW items for the PRSC Site will be performed:

- Installation of the water service line based on the design drawings and specifications provided by the Navy.
- Trench excavation and backfilling associated with the installation of the water service line, four hydrant, and seven curb stops.
- Hydrostatic testing, disinfecting, and water bacterial testing of the water service line.
- Abandonment of four existing water wells serving the PRSC Site.
- Restoration of the areas disturbed by the construction activities.

Additional activities to support water service installation are:

- Preparation of project plans including this Work Plan and Site Safety and Health Plan (SSHP)/Accident Prevention Plan (APP). A Waste Management Plan (WMP), Sampling and Analysis Plan (SAP) and Quality Assurance and Control Plan (QACP) will be included in the Work Plan. SES-TECH will utilize the Storm Water Pollution Prevention Plan (SWPPP) prepared by the Navy's Technical Consultant.
- Performance of health and safety measures and controls as well as soil erosion and sediment controls to protect personnel, the public and the environment.
- Performance of waste management to identify, manage and dispose of all applicable waste streams in accordance with applicable laws and regulations.
- Preparation of a Construction Completion Report (CCR) that includes compilation of field and other project documentation.

#### **5.0 PROJECT MANAGEMENT PLAN AND PROJECT SCHEDULE**

The following sections present key aspects of SES-TECH project organization and management including key personnel and their responsibilities, project management methods and project control methods. SES-TECH will manage this contract through the dedicated Program Management Office (PMO) located in Langhorne, Pennsylvania.

## 5.1 Organization

The project management team will be responsible for all technical and administrative aspects of the water service line installation. The project management team is configured such that one person, Mr. Stavros Patselas, has overall administrative and technical responsibilities for this TO. As the Project Manager (PM), Mr. Patselas reports directly to Mr. Peter McCormick, the EMAC Program Manager. Mr. Patselas is responsible for planning and scheduling the removal action, ensuring that project deliverables are submitted on a timely basis, tracking and managing budgets and schedules, and maintaining a safe work environment and a record of site activities. Mr. Patselas will also attend project meetings to discuss schedule and progress updates with the Navy, as required. The SES-TECH Site Superintendent/Project Quality Control Manager (PQCM) will be responsible for field personnel and the supervision of day to day site activities. Additional details regarding project management, specifically related to quality control (QC) functions required for the project, are included in Section 12, Quality Assurance and Control Plan. Table 5-1 describes the project staff assigned to this project, along with responsibilities and primary reporting chain of command.

**Table 5-1 Personnel Responsibilities and Authorities**

<b>Position</b>	<b>Responsibilities</b>	<b>Reports to</b>
Project Manager (PM)	<ul style="list-style-type: none"> <li>• TO negotiation assistance</li> <li>• Commit project resources</li> <li>• Obtain staffing</li> <li>• Approval - Work Plan, budgets, schedules</li> </ul>	<ul style="list-style-type: none"> <li>• Program Manager</li> </ul>
Quality Control Program Manager (QCPM)	<ul style="list-style-type: none"> <li>• Coordinate and resolve quality concerns</li> <li>• Provide quality-related direction and ensure the training of the POCM and others performing quality-related functions</li> <li>• Suspend project activities if quality standards are not maintained</li> <li>• Interact with the Navy on quality-related issues</li> <li>• Review audit and surveillance reports</li> <li>• Implement the Navy technical directives related to quality</li> </ul>	<ul style="list-style-type: none"> <li>• Program Manger</li> </ul>
Project Environmental Safety Manager (PESM)	<ul style="list-style-type: none"> <li>• Provide for the development and approval of the SSHP</li> <li>• Serve as the primary contact to review health and safety matters that may arise</li> <li>• Approve assigned SSHO responsibilities</li> <li>• Coordinate selection of PPE with the SSHO</li> <li>• Assist in the investigation of all accidents</li> </ul>	<ul style="list-style-type: none"> <li>• Program Manger</li> </ul>
Project Engineer/ Project Quality Control Manager (PQCM)	<ul style="list-style-type: none"> <li>• Provide technical support</li> <li>• Facilitate technical adjustments</li> <li>• Evaluate technical progress</li> <li>• Ensure implementation of QACP</li> </ul>	<ul style="list-style-type: none"> <li>• PM/QCPM</li> </ul>

**Table 5-1 Personnel Responsibilities and Authorities**

<b>Position</b>	<b>Responsibilities</b>	<b>Reports to</b>
Site Superintendent (SS)/Site Safety and Health Officer (SSHO)	<ul style="list-style-type: none"> <li>• Coordinate daily activities</li> <li>• Communicate with Facilities Engineering and Acquisition Division (FEAD)</li> <li>• Schedule personnel and equipment</li> <li>• Supervise field labor and subcontractors</li> <li>• Implement APP</li> <li>• Ensure site staff have adequate medical training</li> <li>• Issue “Stop-Work”</li> </ul>	<ul style="list-style-type: none"> <li>• PM</li> </ul>
Project Controls Engineer	<ul style="list-style-type: none"> <li>• Track budgets and schedule</li> </ul>	<ul style="list-style-type: none"> <li>• PM</li> </ul>
Regulatory Specialist	<ul style="list-style-type: none"> <li>• Waste characterization and waste profile preparation</li> <li>• Prepare manifests and bills of lading</li> <li>• Waste tracking</li> </ul>	<ul style="list-style-type: none"> <li>• PM</li> </ul>

Based on the requirements of the TO, SES-TECH will hire locally based subcontractors to execute the work. Portions of the project that may be subcontracted are summarized in Table 5-2. The subcontractors will be finalized after completion of the procurement process. The PM will direct subcontractors with field supervision provided by the Site Superintendent.

**Table 5-2 Subcontract Services**

<b>Service</b>	
<ul style="list-style-type: none"> <li>• Mechanical Installation</li> <li>• Well Abandonment</li> <li>• Equipment Rental</li> <li>• Geophysical Utility Locating</li> </ul>	<ul style="list-style-type: none"> <li>• Waste characterization analysis of waste water generated during well abandonment</li> <li>• Transportation &amp; Disposal (T&amp;D) of Waste</li> </ul>

## 5.2 Communications

**Weekly Meetings** - Weekly telephone conferences or site meetings between the PM and NAVFAC Mid-Atlantic personnel will address short-term issues such as site personnel, activities schedule, and other issues relevant to the status and forecast of site activities. When necessary, key team members and/or subcontractors will participate in these meetings. Assignments will be identified and documented in these meetings.

**Verbal Updates** - The occurrence of new developments in the project, particularly those that may result in changes to the contract, will be verbally communicated to the Remedial Project Manager (RPM) as information is available. This will allow quicker and better field decision-making consistent with project objectives.

Telephone conferences between the PM and NAVFAC Mid-Atlantic personnel may be used to address issues such as site personnel, activities schedule, and other issues relevant to the status and forecast of site activities. When necessary, key team members and/or subcontractors will participate in these meetings. Assignments will be identified and documented in these meetings.

**Emergency Notification** - In the event of a site emergency, the RPM, the Facilities Engineering and Acquisition Division (FEAD), and the Navy's Facility Manager will be notified immediately after notification of any emergency response teams or organizations.

### **5.3 Cost Control**

The contract procedures will be followed to prepare, monitor and control cost and schedule. On-site support will be provided to maintain the cost reports and schedule during construction.

Contract changes are those increases or decreases in the project that require an increase or decrease in resources. If changes are identified, a Change Request Form (CRF) will be prepared and submitted for Navy approval.

### **5.4 Project Schedule**

The Project Schedule will be prepared in Gantt Chart Format and it will address field activities detailed in the Work Plan. The PM will review and update the project schedule monthly and provide to the Navy as an electronic deliverable via email. The updated schedule will be coordinated with and approved by the RPM. The project schedule also details the submittal schedule for required deliverables and is presented in Appendix A. SES-Tech anticipates to complete the field work based on an 8-hour, 5-day work week over 4 consecutive weeks. The start of field activities is currently scheduled for May 29, 2012.

The schedule follows a Critical Path Method (CPM) type of construction schedule for the installation of the water service line. A target schedule will be created from the original detailed project schedule. Actual project progress will be measured against the target schedule so that variances to the original plan can be easily identified and evaluated. The detailed schedule will be used by the Site Superintendent to plan upcoming manpower and resource requirements on the project. The Site Superintendent will also use the schedule to coordinate material deliveries with construction activities.

### **5.5 Health and Safety Program**

Health and safety is a priority for SES-TECH and prevention of all work place incidents is the goal. The SSHP/APP will include the required APP and SSHP and will be prepared in compliance with EM-385-1-1, Safety and Health Requirements Manual (USACE2008, Occupational Safety and Health Administration (OSHA) requirements in 29 C.F.R. Parts 1910 and 1926 regulations (U.S. Department of Labor, 2008), and the Navy Environmental Restoration Program Manual (Department of the Navy, 2006). The APP is intended as guidance for the SSHO on conducting field work, responding to changing conditions, and making professional judgments based on field data and related hazard control measures. As such, the APP will identify the health and safety responsibilities and reporting requirements for project field and office personnel, specify necessary training, identify health and safety program plans applicable to the project scope of work, and specify site-specific hazards and controls. The SSHP will provide detailed discussion of the potential site-specific physical and chemical or biological hazards associated with the site work and the measures that must be implemented for protection of the site personnel and the surrounding community. Among other safe work practice measures provided by the APP, the SSHP will include the activity hazard analysis (AHA) for each field activity to be conducted, the personal protective equipment (PPE) that will be necessary, and the emergency response action plan for the site.

The Project Environmental Safety Manager (PESM) will certify the APP and SSHP will ensure compliance with these plans. The SSHO will review relevant safety information in these documents with the field team and any subcontractors at the beginning of each day and update the AHAs as needed for

each field activity. The SSHO will ensure that measures detailed in the APP/SSHP will be implemented. Air monitoring will not be required because this is not a contaminated site, however hazardous materials (i.e., fuels) may be used during construction activities.

## **6.0 PRE-CONSTRUCTION ACTIVITIES**

Pre-construction activities are detailed in the following sections.

### **6.1 Water Service Line Design**

The design for the water service line installation was provided by the Navy. SES-TECH will verify the material and equipment specifications for the piping, and other components for the water service line installation. Any existing AutoCAD drawing files of existing site conditions, utility drawings, and other site features will be provided by the Navy for SES-TECH to prepare site layouts as part of project plans.

### **6.2 Mobilization and Site Preparation**

Mobilization activities include the preparation of project submittals. This Work Plan and the system design, as previously discussed, are the primary components of this task. A WMP, SAP, and QACP Plan are included in this Work Plan. The other submittal is the APP/SSHP. The APP/SSHP will be submitted concurrently with this Work Plan. All submittals will be provided to NAVFAC personnel for review and approval.

Subsequent to approval of the Work Plan by NAVFAC, Mid-Atlantic, SES-TECH will begin the procurement process, which includes the identification of materials, equipment, and subcontracts needed to install the water service line. Statements of Work for the procurement packages will be prepared and issued to vendors and contractors. SES-TECH will award the contracts after reviewing the bids and proposals.

Following the approval of the submittals, a pre-construction meeting will be conducted with SES-TECH and NAVFAC personnel prior starting the intrusive field activities. The purpose of this meeting is to develop a mutual understanding of the construction activities, review the project schedule, discuss QC issues, and coordinate site activities with NWIRP Calverton personnel.

Craft labor will be used on an as needed basis. All personnel working at the Site will meet the requirements of the APP.

An area across from the PRSC entrance will be provided by the Navy to serve as a material/equipment lay down and location for temporary facilities. No site security is included for this project.

#### **6.2.1 Utility Clearance**

Prior to the commencement of subsurface work, existing utility drawings, if available, will be reviewed and a site walk will be conducted during the pre-construction meeting to review the proposed excavation areas. The area of proposed soil excavation will also be surveyed using geophysical methods (i.e., ground-penetrating radar and/or electromagnetic induction instruments) to identify underground utilities. New York State Dig Safely (CALL 811) will be contacted at least three business days before subsurface work is to begin. Survey findings as well as Dig Safely Confirmations Tickets will be provided to the FEAD for review.

## 6.2.2 Site Control/Traffic Control

The Site is open to public access, access to the work areas or staging areas will be controlled with signage and barriers as needed. Site security will not be provided.

Traffic controls will be implemented so that field activities can be completed in an efficient and safe environment. Since some work is occurring on the ingress/egress road for the PRSC, traffic patterns may be disrupted. SES-TECH will identify when access issues may occur and will work with the Navy and PRSC facility personnel, if acceptable to the Navy, to ensure that work will impact PRSC activities as little as possible. Traffic flow requirements, vehicle turn-around areas, and material staging areas will be identified through discussion with the Navy, and access issues will be communicated to site workers through daily briefings. A flagman will be used to control traffic flow, when needed.

## 7.0 SITE WORK

Specific site tasks associated with the installation of the water service line are discussed in greater detail in this section.

### 7.1 Installation of Soil Erosion and Sediment Controls

Erosion and sediment controls measures will be installed to prevent soil and surface water run-off prior and during construction activities. Approximately 500 feet of silt fence will be installed for erosion and sediment control at the construction site. Other controls are not anticipated. The erosion and sediment controls measures will be inspected each working day. Excavated materials will be staged along the trenched areas for reuse as backfill. Silt fencing will be installed to control erosion and migration of excavated materials.

### 7.2 Installation of the Water Service Line

The following sections detail the construction activities required to install and test the water service line. The new water service line will consist of 2,100 linear feet of HDPE pipe, four new yard hydrants and seven curb stops. Project Design/Drawings and Technical Specifications provided by the Navy and detail:

- Water line installation layout
- Material specifications
- Pipe testing requirements for hydrostatic and disinfection
- Site Restoration

#### 7.2.1 Trench Excavation and Backfilling

Trench excavation will be performed using a mini-excavator, backhoe or similar type equipment with a 12-inch wide bucket in order to minimize the work area to avoid restricting any PRSC driveway traffic. Trench excavation to a 5-foot depth will commence away from the reduced pressure zone (RPZ) and toward the PRSC driveway. The new water line will cross the driveway and then be installed along the eastern edge of the driveway toward the pistol range. The trench pathway will be directed to minimize the removal of tree branches.

Trenching will be conducted in stages. A limited length of trench will be excavated, then water service line (2-inch HDPE) piping will be installed in the trench, and finally backfill of the limited area will be completed. The 2,100 linear feet of 2" diameter HDPE piping will be installed using 100 feet coils of pipe. Pipe butt fusion will occur on the ground surface in order to prevent trench entry.. Fusion joint locations will be marked with a stake and documented for as-built purposes. Excavated materials will be staged along the trench for reuse as backfill after the pipe has been installed. Trenching will then commence along the pathway in the next limited area. Trenching and backfilling in stages will avoid large open excavation areas and limit the area of disturbance.

Certified clean sand for pipe bedding will be imported at the project start and used 4-inches above and below the installed 2-inch HDPE pipe. Import of pipe bedding shall be discontinued if excavated native sand material is determined to be suitable. The remainder of the trench above the pipe bedding section will be backfilled with the excavated native material and compacted in lifts. Roadway crossings only will be backfilled in 8-inch lifts and compacted to achieve 95% modified proctor density. A metallic warning tape shall be placed in the trench during backfill activities at a depth not greater than 18-inches below ground surface. Backfill will be graded to meet existing grade. Details on site restoration are provided in Section 8.0.

#### 7.2.2 Water Service Line Installation

The end of the 2-inch copper tubing extending out from beneath the existing RPZ vault will be located. A mechanical joint will be used to connect the copper tubing to the 2-inch HDPE piping for the water service to the PRSC facilities. The HDPE piping will be installed using separate 100 feet coils of 2-inch diameter. Pipe butt fusion locations will be staked in the field in order to relocate the joints in the event of failed pressure tests. Four frost proof yard hydrants and seven curb stops shall be installed at locations shown on and in accordance to Appendix B - Project Design/Drawings and Technical Specifications provided by the Navy.

#### 7.2.3 Water Line Testing

The new water line will be hydrostatically tested and disinfected prior to connection to existing facility feeds. A pressure of 150 psig will be maintained for a minimum of 2 hours. The water line will then be disinfected with chlorine solution and flushed. The chlorine solution will be tested to confirm that is at a 0.2 to 0.2 ppm concentration of chlorine. All valves in the line will be opened and closed multiple times to ensure disinfection. The diluted chlorine solution and flush water mixture will be directed and drained below ground surface or to an above ground surface area away from any surface water body and pre-approved by PRSC.

A minimum of 2 consecutive sets of water samples will be collected from each of four water service connections and submitted to a laboratory for bacteria analysis. The test results must demonstrate absence of bacteria prior to the final connections of new water service piping to existing piping at the pistol range, play house, main lodge, and residence locations.

#### 7.2.4 Backfill Density Testing

SES-TECH will obtain a subcontractor to perform the in-situ density testing. Backfill compaction will be tested to achieve 95% modified proctor density. Compaction testing will be performed at driveway crossings only.

### 7.3 Well Abandonment

Four existing 75-foot deep (estimated) water wells, currently used to supply water to the PRSC, will be abandoned upon successful completion of water service connections. Existing pumps and piping will be removed from the wells after confirmation of power disconnection. Removed pumps (and piping if desired) will be provided to PRSC. Sand will be used in the well screen area followed by a grout bentonite mixture above to the top. Driller will try to feel the top of screen with a weighted tape. Typically the screen inner diameter (ID) is smaller than the well casing ID. If the top of well screen cannot be determined then we assume no more than 10' of screen and will proceed to abandon accordingly.

Well abandonment will be performed by a well driller licensed in the State of New York and in accordance with applicable well abandonment regulations. SES-TECH will obtain a drilling subcontractor to perform the well abandonment.

It is anticipated that the well water may contain some concentrations of chlorinated solvents associated with the groundwater contaminant plume. Displaced water will be contained around the well head and then containerized in 55-gallon steel drums for waste classification and off-site disposal. Drilling equipment and removed well pumps will be decontaminated with a potable water rinse and air dried. Decontamination fluid will be collected and containerized with the displaced water generated during the well abandonment.

### 7.4 Material Reuse and Waste Disposal

T&D of waste material will be performed as described in Section 11 Waste Management Plan. It is anticipated that only solid/municipal waste (i.e., PPE, minor construction debris and waste, abandoned well materials) and displaced water from the well abandonment will be generated during the water service line installation. No hazardous wastes are anticipated. Waste characterization samples will be collected from the well abandonment water.

It is anticipated that soils excavated during trenching activities will not be contaminated and will be used as backfill in the trenches. No chemical testing of the soil will be performed. Though not anticipated, the soils will be visually inspected for staining or other signs of contamination. If encountered, SES-TECH will notify the Navy of the findings

Approximately 600 gallons of dilute chlorine/ flush water mixture will be used to disinfect the water line after installation of the line is complete. The water will be released, slowly, into the trench surrounding the line in a way that allows complete infiltration to the soil or to an area on the PRSC Site with approval from PRSC. The flush water mixture will not be directed onto grass areas or toward open water bodies.

Displaced water generated during well abandonment will be contained around the well head and then containerized in 55-gallon steel drums for waste characterization, profiling, and transportation to a Navy pre-approved disposal facility. Sample collection and analysis is detailed in Section 10.0 Sampling And Analysis Plan.

## **7.5 Decontamination**

Dry decontamination (gross decon and dry brushing) will be conducted on site equipment. It is anticipated that vehicles and equipment will not enter excavation areas therefore tires and tracks will not encounter soil. Site soil is not considered to be contaminated but equipment will be returned to vendors in a similar or better condition than received. Best management practices (BMPs) as detailed in the Drawings/Design and Technical Specifications provided by the Navy will be implemented. Care will be taken to not track any loose soil around or off the site.

## **7.6 As-Built Records**

SES-TECH will red-line the Navy construction drawings and submit for as-built documentation of construction efforts. A pre- and post-construction survey by a New York State Professional Land Surveyor will not be performed.

## **7.7 Demobilization**

Demobilization will consist of dry decontamination of equipment that was used to conduct the NTCRA. SES-TECH will collect and dispose of all waste as per Section 11 Waste Management Plan. After all waste has been removed but prior to receiving an authorization to demobilize, SES-TECH will conduct a final walk through with the FEAD and establish a punch list of items that require further attention. After addressing all punch-list items, SES-TECH will remove all equipment and personnel from the site and the field work will be considered complete.

## **8.0 SITE RESTORATION**

Disturbed ground surfaces will be restored to original or better condition. After backfill completion, the driveway crossing areas will be capped with ¾-inch gravel or recycled concrete aggregate and land cover areas capped and slightly mounded with native material. Land cover areas may be seeded and/or planted. A locally prevalent seed mix will be used subject to PRSC approval. Plantings will include at least native two pitch pines and several native inkberry plants around the perimeter of RPZ vault. The final number of plants will be dependent upon the size of the area to be landscaped and the growth habit of the plants.

Upon completion of construction activities, construction equipment and personnel will be demobilized. Construction equipment will be returned to the respective supplier when it is no longer needed. Erosion silt fence will be removed and materials, equipment and wastes removed off-site as part of demobilization from PRSC property.

## **9.0 CONSTRUCTION COMPLETION REPORT REQUIREMENTS**

Field activities will be summarized in a CCR. The CCR will include daily field activities forms, imported fill certifications, compaction testing results, water line hydrostatic and disinfection testing results, material cut sheets, waste management records, red-lined as-built record drawings, material safety data sheets, driller certifications, well abandonment details, and other field data and project documentation. The CCR (Draft and Final) will be prepared and submitted to the Navy for review, comment/revision and approval. The Draft version will be submitted to both the Navy and NYSDEC. SES-TECH will incorporate Navy and regulator comments into the Final submittal.

SES-TECH will obtain access to the Navy Installation Restoration Information Solution (NIRIS) for submittal of analytical data. NIRIS Electronic Data Deliverable (NEDD) submittals will be coordinated with the NAVFAC RPM. Analytical reports will be submitted to the Navy for review prior to NIRIS submittal. Environmental spatial data (i.e., site boundary information) will be submitted in accordance with the current Non-NEDD Deliverable Submittal Guidelines

## **10.0 SAMPLING AND ANALYSIS PLAN**

The section provides details on the waste classification sample collection of the water generated during the well abandonment. Other wastes generated during the NTCRA, as detailed in Section 11, are not contaminated and no samples will be collected from these wastes. Details on hydrostatic testing and bacterial testing of the water and compaction testing of the backfill are presented in the Technical Specifications provided by the Navy and are not included in this SAP.

### **10.1 Wastewater Sampling**

Waste water generated during well abandonment will consist of displaced groundwater and decontamination fluid from the well abandonment task. Approximately 200 gallons of waste water may be generated during the well abandonment task. It is anticipated that the waste water will be classified as non-hazardous waste.

A grab sample of the waste water will be collected from the waste water storage drums. A clean bottle or a drum thief will be lowered into the container and the contents will be placed into the appropriate labeled sample bottles. The sample(s) will be documented and shipped using the protocols presented in the next section.

It is anticipated that at least one representative sample will be analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, Target Analyte List (TAL) Metals, polychlorinated biphenyls (PCBs), total organic hallogens (TOX), ignitability, reactivity, and corrosivity. Final sample collection frequency and analytical requirements will be based on the disposal facility requirements. Data will be used to prepare the waste disposal profile for disposal facility acceptance. Table 10-1 details the sample method, container and preservation requirements for the waste water sample analysis.

Samples will be analyzed by a Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) certified laboratory approved by the Navy. Sampling procedures and quality assurance/quality control (QA/QC) requirements for waste classification samples will be consistent with those described in the *Navy Installation Restoration Chemical Data Quality Manual*, Naval Facilities Engineering Service Center, September 1999.

**Table 10-1 Waste Water Sample Method, Container and Preservation Requirements**

Parameter	Proposed Test Method	Container	Preservation	Holding Time
TCL VOCs	8260B	(2) 40 ml glass vials w/ Teflon-lined septum; No headspace	Ice to 4°C	7 Days
TCL SVOCs	8270D	(2) 1-liter amber glass w/  Teflon-lined cap	Ice to 4°C	5 from verified time of sample receipt (VTSR) Days Extract 40 Days to Analyze
TCLP VOCs	1311/8260B	(2) 40-ml glass vials w/ Teflon-lined septum; No headspace	HCL to pH <2 Ice to 4°C	7 Days to Extract 7 days to Analyze
TCLP SVOCs	1311/8270D	(1) 1-liter glass w/  Teflon-lined cap	Ice to 4°C	5 Days VTSR to TCLP Extract 7 Days to preparatory Extract 40 Days to Analyze
TAL Metals (includes Cr and Cd)	6010B	(1) 1-liter polyethylene	Nitric Acid to pH<2; Ice to 4°C	6 Months  (Hg - 28 Days)
TCLP Metals	1311/6010B/ 7471A	(1) 1-liter glass or polyethylene	Nitric Acid to pH<2; Ice to 4°C	180 Days (Hg - 28 Days)
TOX	9020B	(2) 1-liter amber glass w/  Teflon-lined cap; no headspace	H2SO4 to pH<2; Ice to 4°C	28 Days
PCBs	8082A	(1) 1-L amber glass w/Teflon- lined cap	Ice to 4°C	5 VTSR Days Extract 40 Days to Analyze
Specific Gravity	ASTM 213E	(1) 100 ml glass or plastic	N/A	28 Days
Ignitability	Method 1020A	(1) 1-liter amber glass w/ Teflon-lined cap	N/A	N/A
Reactivity	SW-846 Chp. 7.3	(1) 1-liter amber glass w/ Teflon-lined cap; no headspace	Ice to 4°C	Analyze Immediately
Corrosivity	Method 1110	(1) 500-ml polyethylene	N/A	N/A

#### 10.1.1 Documentation, Packaging and Shipping

Chain-of-Custody (COC) forms, sample labels, custody seals, and other sample documents will be completed. Each sample will be properly identified and sealed in a polyethylene (PE) bag. The bag will be placed in a fiberboard cooler, which has also been lined with a large PE bag. The samples will be packed with sufficient ice (sealed in PE bags) to cool the samples to 4° C. Non-combustible absorbent

cushioning material will be added to minimize the possibility of container breakage. A temperature blank consisting of potable water will be included in each cooler to document cooler temperature upon receipt at the laboratory. The large PE bag in the cooler will be sealed and the container closed. Custody seals and nylon strapping tape will be affixed to the cooler. All samples will be shipped within 24 hours of collection via a common carrier. All sample coolers and samples will be shipped in accordance with New York Department of Transportation (DOT) requirement and regulations. A COC record will be used to record the custody of samples, and will accompany the samples at all times.

## 11.0 WASTE MANAGEMENT PLAN

The objective of Waste Management is to ensure the safe handling, management, T&D of all waste streams generated during the construction activities. T&D activities will be conducted in compliance with all applicable Federal, NY State, and local requirements.

### 11.1 Waste Classification

The following is an overview of the classification requirements for wastes generated during the construction activities. Refer to Table 11-1, Summary of Waste Material, for a summary listing of classification and disposition requirements by individual waste stream. Wastes are anticipated to be non-hazardous under RCRA, however, information and protocols pertaining to a RCRA waste classification are included in the following section.

The project Regulatory Specialist will confirm waste classification assumptions by reviewing generator/historical knowledge and/or the analytical data for each waste stream prior to off-site T&D. A waste certification and Waste Profile Sheet will be provided to the Navy for review, approval, and generator signature prior to off-site disposal of each waste stream designated for off-site disposal.

**Table 11-1 Summary of Waste Material**

Waste Stream	Volume	Classification	Disposition
Displaced Water from Well Abandonment	Approximately 200 gallons	RCRA Non-hazardous or RCRA Hazardous (depending upon sample analysis)	If hazardous: Off-site disposal – Subtitle C Waste Water Treatment Facility (WWTF); or if non-hazardous: off-site disposal at an appropriately permitted WWTF or to a nearby Navy wastewater container (if available).
PPE/Construction Debris/Construction Waste	TBD	Solid/Municipal Waste	Off-site disposal - RCRA Subtitle D Solid Waste Landfill

## **11.2 Hazardous Wastes**

Pursuant to 40 CFR 262.11 and 6 NYCRR 371, generators are required to classify their wastes prior to disposal. Based generator knowledge listed hazardous wastes are not expected to be present on-site. Unless the well abandonment waste water equals or exceeds the Federal RCRA Toxicity Characteristic limits, the waste water would be classified as non-hazardous waste.

## **11.3 Screening/Segregation**

Wastes will be segregated by type of material/final waste disposition. The goal is to separate waste as accurately as possible into categories that will facilitate cost-effective management of the wastes.

## **11.4 Containerization**

Trash PPE, and general construction debris/construction waste will be disposed of at an area designated by the Navy as solid/municipal waste.

United USDOT specification 1A1 (closed top) and 1A2 (open top) steel drums will be used for containerizing the waste water generated during the well abandonment for this project.

## **11.5 Accumulation/Storage**

Containers holding non-putrescible solid wastes will be removed for off-site disposal as soon as possible but are allowed to remain Navy property for up to one year from their accumulation start date if necessary. SES-TECH will obtain NWIRP-Calverton specific solid waste storage requirements from the FEAD prior to mobilization and will work in accordance with these requirements.

Though hazardous waste is not anticipated, any on-site hazardous waste storage will comply with generator requirements listed in 40 CFR 262 and 6CNYRR 372. If waste is classified as a hazardous waste based on analytical data, it will be necessary to ship the waste off-site for disposal in less than 90 days due to the RCRA Hazardous Waste Generator 90 day storage limits unless specific approval has been received from NYSDEC. Any waste container storage areas for RCRA Hazardous wastes will be equipped with secondary containment and have signage stating access only by authorized personnel.

## **11.6 Container Inspections**

An inventory of solid waste containers will be maintained while in the container storage areas. In addition, regular inspections of container storage areas will be conducted. The inspections will check the integrity of the containers and secondary containment, check for leaks or spills, and ensure that labels and markings are in good condition.

If hazardous wastes are stored on-site, the hazardous waste storage area shall be inspected and documented weekly to ensure proper labeling and marking, and to monitor the condition of the containers and the condition of the storage area. The weekly inspection reports will be maintained in the project file and copies will be provided to the Navy.

## **11.7 Container Labeling and Marking**

At the time of generation, all waste containers will be marked in indelible ink, paint or grease pencil with the following information:

- Source and location
- Contents of material in the container and expected hazards
- Accumulation start date for hazardous wastes
- Out of Service Date for PCB wastes
- Date container was sampled
- HAZARDOUS WASTE label if known or suspected to contain hazardous wastes
- NON-HAZARDOUS WASTE label if known or suspected to contain non-hazardous wastes.

Upon receipt of analytical results, the waste will be classified by the Regulatory Specialist, in consultation with NAVFAC personnel, in accordance with applicable regulations. Based upon final classification, the Regulatory Specialist will select a proper USDOT Shipping name and description for any USDOT regulated hazardous materials. The Regulatory Specialist will direct the completion of any required USDOT markings and labels and will specify the placarding requirements for the transportation vehicle.

### **11.8 Permitting/Notification Requirements**

Since it is anticipated that waste will be non-hazardous, no notifications are required for on-site waste management activities. No permits are required for on-site activities both on and off Navy property. The majority of work will occur off Navy property.

If waste is determined to be hazardous, the Navy will be notified immediately. Notifications and permitting may be required. The Navy will likely have to provide an EPA ID number in order to store and ship the waste for off-site disposal.

### **11.9 Selection and Identification of TSDFS**

Waste disposal facilities to be used for this project have not yet been selected and will be selected via competitive bid in accordance with Federal Acquisition Regulation (FAR) requirements. A Formal Request for Proposal (RFP) will be prepared after project mobilization. Facilities will be selected in accordance with the requirements of the RFP and SES-TECH Regulatory Compliance Procedures. Each of these facilities is subject to final approval by the Navy.

### **11.10 Complete Manifest Packages**

Bills of Lading or non-hazardous waste manifests will be used for shipment of all non-hazardous wastes. A Complete Manifest Package (CMP) will be prepared by the Regulatory Specialist and submitted to the Navy for each waste stream destined for off-site disposal. The principal components of the CMP will consist of:

- Hazardous Waste Manifests, Non-Hazardous Waste Manifests, or Bills of Lading
- Waste Profile Sheets
- Land Disposal Restriction Waste Notification Forms, if required

Supporting documentation will include Material Safety Data Sheets (MSDS), waste disposal history, analytical results, waste certifications performed by SES-TECH, information reviewed in identifying the proper USEPA waste codes and USDOT Proper Shipping Names, and packaging, labeling, and marking requirements.

SES-TECH will submit a CMP to the Navy for each waste stream for review and approval prior to shipment. After the CMP has been approved and signed, two copies of the approved and signed CMP will be prepared. One copy will be placed in the project file and one copy will be returned to the Navy with the transporter-signed copies of the manifests and Bills of Lading.

An EPA Uniform Hazardous Waste Manifest will be used for all off-site hazardous waste shipments.

### **11.11 Recordkeeping and Reporting Requirements**

SES-TECH will supply the following documents to the Navy to enable the Navy to comply with the records retention and reporting requirements under RCRA:

- Generator signed manifests
- TSDf signed manifests
- Land Disposal Restriction Waste Notification Forms
- Manifest Discrepancy and Exception Reports
- Waste Profile Sheets
- TSDf Certificates of Disposal/Destruction (when available)
- All test results, waste analyses and waste determinations

These records will be supplied in the CMP with a duplicate submitted in the CCR.

Discrepancy Reports will be prepared for the Navy's approval and signature for any manifest discrepancy related to waste type or volume. These reports will be prepared and submitted within 15 days after waste receipt by the TSDf.

Manifest Exception Reports are required if a generator does not receive a TSDf signed manifest within 45 days of the shipment date. If SES-TECH does not receive a manifest by the 35th day, SES-TECH will contact the TSDf and verify the shipment status and prepare an Exception Report, which will be submitted to the Navy Representative for approval and signature by the 40th day. SES-TECH will document all calls to locate the shipment and include the documentation in the Exception Report.

## **12.0 QUALITY ASSURANCE AND CONTROL PLAN**

This section presents the QACP which details the project QC program. The organizational structure, functional responsibilities, levels of authority, and lines of communication within the organization have been established in the Program Quality Control Management Plan and other contract documents to ensure high-quality work. The Program Quality Control Management Plan was prepared to address QC program implementation for projects under the EMAC Contract. This QACP summarizes relevant aspects of the Program Quality Control Management Plan and their relation to the NTCRA for PRSC Site. The project organization chart showing the reporting lines for key personnel is provided in Appendix C.

This QACP was also developed to verify that the placement and quality of the materials used in construction are in compliance with the Contract Drawings and Technical Specifications provided by the Navy. The QACP establishes specific procedures and methods for field inspections, and provides an effective system to ensure the quality of work performed by SES-TECH and its subcontractor personnel during the NTCRA. The QACP is applicable to all definable features of work (DFW) listed in the QACP

and will be available during field activities. All work activities will be conducted in accordance with the Work Plan.

### 12.1.1 Quality Control Management Overview

The QACP requires a quality assurance overview of the QC program implementation. Mr. Greg Joyce, QC/PM, will perform regular internal checks on the implementation of the QC Program. Reports of any deficiencies will be provided to Mr. Stavros Patselas, PM, for corrective action. Inspections will be performed and checked for the following:

- Conformance with Work Plan and associated plans
- Thoroughness of performance
- Identification and completeness of documentation generated during performance

Mr. Stavros Patselas, PQCM, or a designated representative acceptable to the Navy, will implement QC for site activities during the NTCRA. The PQCM will report directly to the QC/PM and will have direct communication with the PM regarding site QC issues.

The Quality Control Program is organized into four (4) elements under the project management team as presented in Section 5.0:

- Contract Administration
- Quality Control
- Health and Safety
- Project Management

The QC program provides quality control and assurance by monitoring, auditing and conducting field inspections to ensure compliance is being maintained. Maintenance on the project records and required reports and logs is also addressed in the QA program. The QC program will ensure that submittals are correct and complete before forwarding to the Navy.

## 12.2 Documentation

All test results, both passing and failing, will be documented in the Daily Contractor Quality Control (CQC) Report for the day the results are obtained. Paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. The test reports will be available for review by the FEAD and transmitted with the CCR.

The PQCM is responsible for maintenance of current records of QC operation, activities, inspections, and tests performed, including the work of subcontractors and suppliers. The records will include factual evidence that required QC activities and tests were performed.

## 12.3 Definable Features of Work

A DFW is defined as an activity or task separate and distinct from other activities that requires separate control activities. A DFW establishes the control measures required to verify both the quality of work performed and compliance with specified requirements, which include inspecting materials and workmanship before, during, and after each DFW.

Preparatory and Initial inspections will be performed on all DFWs, with the exception of mobilization and demobilization (site cleanup and final inspection).

### 12.3.1 Site-Specific Features of Work

The project consists of tasks required to perform a NTCRA, specifically, the installation of a water service line at the PRSC Site. The tasks outlined in the bulleted list below will be organized into the DFW. These DFW will be executed through the QACP. This NTCRA SOW includes the following tasks:

- Installation of the water service line based on the design drawings and specifications provided by the Navy.
- Trench excavation and backfilling associated with the installation of the water service line, four hydrants, and seven curb stops.
- Hydrostatic testing, disinfecting, and water bacterial testing of the water service line.
- Abandonment of four existing water wells serving the PRSC Site.
- Restoration of the areas disturbed by the construction activities.

**Table 12-1 Definable Features of Work**

Mobilization	Mobilize personnel, equipment and materials to the Site, including subcontractor mobilization.
Underground Utility Clearance	Review available utility drawings, perform Miss Utility Call, perform geophysical survey to identify underground utilities
Implement site control and site traffic control	Implement site access controls such as signage and barriers to control access to the site for the public, PRSC personnel and site personnel. Implement traffic controls to control flow of site traffic.
Install erosion and sediment control measures	Install silt fence in accordance with Storm Water Pollution Prevention Plan and Soil Erosion and Sediment Control Plan provided by Navy.
Trench Excavation	Trench excavation to a 5-foot depth in stages. Stage excavated material along trench for reuse as backfill.
Installation of the water service line, four hydrants, and seven curb stops and testing	Installation of 2-inch HDPE water service line, four yard hydrants, and seven curb stops. Perform Hydrostatic testing, chlorinated disinfection, and water bacterial testing of the water service line
Excavation backfilling, compaction testing and regrading	Install certified clean sand for pipe bedding 4-inches above and below the installed 2-inch HDPE pipe. Backfill remainder of trench with the excavated material and compact in lifts. Perform density testing at driveway crossings. Grade to meet existing grade.
Well Abandonment	Abandon four existing water wells in accordance with NYSDEC regulations.
Waste management	Segregation, waste classification, storage and handling of waste materials including waste water, trash, PPE and construction debris.
Decontamination	Dry decontamination will be conducted on site equipment before demobilization off-site.

As-Built Records	The Navy construction drawings will be red-lined to provide as-built documentation of construction efforts.
Site Restoration	Disturbed ground surfaces will be restored to original or better condition. Driveway crossing repair/replacement and seeding/planting will occur.
Demobilization	Demobilization will consist of final disposal of all waste. Conduct a final walk through with the FEAD and establish a punch list of items that require further attention. Complete punch list to complete site work.

## 12.4 Submittals

This section describes the review and approval process of submittals. SES-TECH will institute and maintain a submittal register to track submittals from issuance to approval. A list of required submittals will be developed at the initiation of project activities.

## 12.5 Submittals Processing

### 12.5.1 General

SES-TECH will use and maintain the Submittal Register to track submittals from issue to approval, and to comply with the Navy requirement for submittals under the Basic Contract. SES-TECH will forward submittals requiring Navy approval and will submit these items as listed on the Submittal Register.

Each submittal will be complete and in sufficient detail for ready determination with the contract requirements. All items will be checked and approved by the QCPM, or designated representative, and will be transmitted via an appropriate transmittal form which will be initiated and dated by the QCPM indicating that the accompanying submittal conforms or does not conform to contract requirements.

Required submittals will be provided to project personnel as determined by the distribution schedule. Each submittal will be assigned a unique document control number. A transmittal form will accompany each submittal. Each transmittal will be identified with:

- Contract and TO number
- Name and address of the submitting organization
- Date of submittal
- Description of item being submitted, including reference to specification section (if applicable)
- Approval of submitting organization indicating conformance to the requirements

### 12.5.2 Receipt of Submittals

The QCPM will enter each submittal into the Submittal Register, determine if approval is required by the Navy, and proceed with review of submitted material.

Submittals will be electronically submitted to the Navy as listed below:

### **Department of the Navy – NAVFAC Mid-Atlantic**

- Mr. James Tarr, Remedial Project Manager

### **Department of the Navy– PWD**

- Mr. Christopher Shukis, PWD FEAD New London

### **Department of the Navy– NWIRP**

- Mr. Greg Pearman, FEAD
- Mr. Al Taormina, Facility Manager

## **12.6 Quality Control Meetings**

### **12.6.1 Coordination and Mutual Understanding Meeting**

Prior to the start of site work, a coordination and mutual understanding meeting will be held to discuss the QC Program requirements. Navy personnel attending the meeting will include the RPM, FEAD, and the FEAD's Construction Management Technician (CMT). The purpose of this meeting is to develop a mutual understanding of the QC details, including forms to be used, administration of on-site and off-site work, coordination of the field activities, production, and the PQCM duties with the FEAD. At a minimum, the SES-TECH personnel required to attend the meeting will include the PM, Field Engineer, SS, PQCM, and SSHO. Minutes of the meeting shall be prepared by the PQCM and signed by the PM and the Navy's RPM and/or FEAD or designated representative. The meeting may be held in conjunction with the preconstruction meeting.

### **12.6.2 QC Meetings**

After the start of field activities, the PQCM will conduct QC meetings at a frequency of once per week or as required by the FEAD. The meetings will be held at the project site and will be attended by the FEAD, FEAD CMT, SS, SSHO, and PQCM. The PQCM will notify the FEAD at least 48 hours in advance of each meeting.

The following will be covered at each weekly QC meeting:

- Review the minutes of the previous meeting
- Review the schedule

Work or testing accomplished since last meeting

- Rework items identified since last meeting
- Rework items completed since last meeting
- Review the status of submittals:
- Submittals reviewed and approved since last meeting
- Submittals required in the near future

Review the work to be accomplished in the following 2 weeks, documentation required and schedule for the three phases of control and testing:

- Establish completion date for rework items
- Required preparatory phase inspections
- Required initial phase inspections
- Required follow-up phase inspections
- Required testing
- Status of off-site work or testing
- Required documentation
- Identification of deficient conditions
- Resolve QC and production problems

## **12.7 Inspection**

This section discusses the inspection process for the Definable Features of Work (DFWs) that will ensure compliance with the contract.

The DFWs for this project are identified in Table 12-1.

The QACP includes implementing the following three control phases for all aspects of the work specified:

- Preparatory phase
- Initial phase
- Follow-up phase

### **12.7.1 Preparatory Phase Inspection**

The PQCM will conduct preparatory phase inspections prior to starting the DFWs listed in Table 12-1 with the exception of mobilization and demobilization. These inspections shall include the following:

- Review the Work Plan and Standard Operating Procedures.
- Ensure that all required procurement forms for supplies and services are approved.
- Ensure that provisions have been made to provide the required QC inspection.
- Ensure that all personnel have the required training and certifications needed to perform the work.

Examine the work area to ensure that all required preliminary work has been completed and is in compliance with the approved Work Plan.

- Examine the required materials and equipment to ensure that they are properly delivered to the site, conform to specifications, and are properly stored.
- Review the appropriate AHAs to ensure that safety requirements are met.
- Discuss procedures for performing the work, including potential repetitive deficiencies.
- Document workmanship standards for the particular phase of work.
- Ensure that the QACP for the work to be performed has been accepted by the Navy.

The PM, RPM, and FEAD will be notified at least 2 working days in advance of each preparatory phase activity. This phase will include a meeting conducted by the PQCM and attended by any personnel involved in performing the DFW. The issues discussed during the preparatory phase meetings will be

documented on the Preparatory Inspection Checklist included in the QACP. The PQCM will explain the acceptable level of workmanship required to personnel performing work activities.

In addition the PQCM will conduct frequent internal inspections of the DFW listed on Table 12-1. The PQCM is not required to notify the Navy or the PM prior to these inspections.

#### 12.7.2 Initial Phase Inspection

An initial inspection will be performed at the beginning of a DFW and will include the following:

- Check preliminary work to ensure that it is in compliance with contract requirements.
- Review the Inspection Checklist documenting results of the preparatory meeting.
- Verify full contract compliance, including required control inspections.
- Establish the required level of workmanship, testing, and inspection to ensure that work meets minimum acceptable standards.
- Resolve all differences.
- Check safety requirements to include compliance with and upgrading of the APP/SSHP and AHAs.

The PM, RPM, and FEAD will be notified at least 2 working days in advance of each initial phase activity. The PQCM will document initial inspections for each item using the Initial Inspection Checklist and attach it to the Daily CQC Report. The location of the initial phase inspection and documentation will be identified for future reference and comparison with follow-up inspections. The initial phase inspection will be reviewed each time a new work party/crew arrives on-site or when the definable features of the work change.

#### 12.7.3 Follow Up Phase Inspection

During the completion of a particular work feature, follow-up inspections will be conducted to ensure compliance with contract requirements. The frequency of the follow-up inspections will depend on the extent of the work being performed. Each follow-up inspection will be documented on the Daily CQC Report. A Follow-up Inspection Checklist (Attachment 3), will be generated for any deficient conditions identified during the Initial Inspection and attached to the Daily CQC Report when all items are resolved. A final follow-up check will be conducted on any completed work phase prior to the commencement of a subsequent phase.

#### 12.7.4 Receipt Inspection

The PQCM will conduct inspections of materials prior to their use and installation. These inspections will be documented on a receipt inspection form and maintained on-site. Any material(s) that does not meet design specifications will be rejected and returned to the vendor. Nonconforming material will be segregated and marked accordingly, to prevent inadvertent use. The PQCM will record on the Daily CQC Report that a material inspection was performed.

#### 12.7.5 Additional Inspections

The PQCM may conduct additional inspections on the same DFWs under the following circumstances:

- If the quality of ongoing work is unacceptable as determined by the PQCM, PM, SS, RPM, or FEAD

- If the quality of the work is suspected of being below the established criteria of acceptance
- If work on a DFW is resumed after a substantial period of inactivity
- If other problems develop

## **12.8 Completion Inspections**

Completion inspections will be performed as summarized in this section.

### **12.8.1 Construction Quality Control Completion Inspection**

The PQCM will conduct a detailed inspection prior to the pre-final inspection, when all of the work or an increment of work is deemed to be substantially complete. The work will be inspected for conformance to plans and specifications, workmanship, and completeness. The PQCM will prepare an itemized list of work that does not conform to plans and specifications, inferior workmanship, or incomplete work. The list will also include outstanding administrative items, such as record (as-built) drawings. The list will be included in the QC documentation and submitted to the PM following the inspection and will specify an estimated date for correction of each deficiency. The completion inspection will be documented on the Completion Inspection Checklist (Attachment 3) and attached to the Daily CQC Report.

### **12.8.2 Pre-Final Inspection**

The PM or designated representative will conduct the pre-final inspection. The RPM, FEAD, PQCM, SS, and other primary management representative(s), as applicable, will attend. The PM will schedule the pre-final inspection when notified by the PQCM that the work is ready for inspection. The PQCM is required to verify at this time that all specific items previously identified as being unacceptable, along with all remaining project work, will be complete and acceptable by the date scheduled for the pre-final inspection. At this inspection, the FEAD will develop a list of incomplete and/or unacceptable work performed under the contract and will provide this list to SES-TECH

### **12.8.3 Final Acceptance Documentation**

The PM will schedule the final acceptance inspection based on notification from the PQCM of readiness. The RPM, SS, FEAD, PQCM, and other primary management representative(s), as applicable, will attend. Notification will be provided prior to the planned final acceptance inspection date and must include verification that all specific items previously identified as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection.

### **13.0 REFERENCES**

Environmental Multiple Award Contract Scope of Work for Installation of Water Service to Peconic River Sportsman's Club at Suffolk County, Long Island, NY. Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic Division, June 14, 2011.

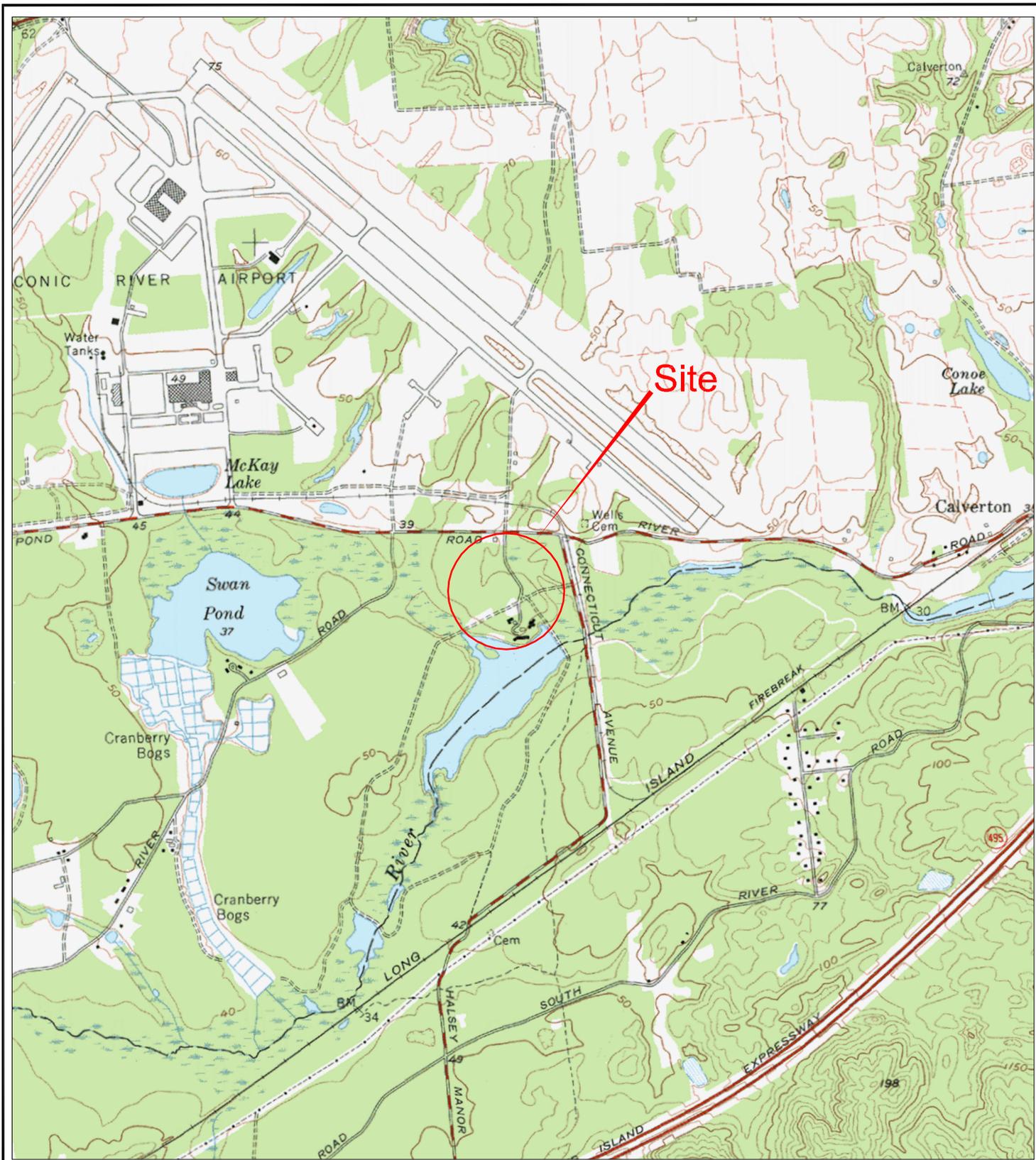
Action Memorandum: Water Supply Line for the Off-Site Southern Area at Naval Weapons Industrial Reserve Plant Calverton, NY. Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic Division, May 2010.

Engineering Evaluation/Cost Analysis (EE/CA) SITE 6A - Southern Area Off-Site Water Supply Naval Weapons Industrial Reserve Plant Calverton, New York. Tetra Tech NUS, Inc., November 2009

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## **FIGURES**

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0 2000 4000 Feet



Source: U.S.G.S. Topographic Maps (7.5 Minute)  
Wading River, NY Quadrangle

NAVFAC MID-ATLANTIC  
Hampton Roads RAO LTM EMAC

NWIRP Calverton, NY  
Southern Area  
Site 6-A PRSC

Figure 1  
Site Location Map

**SES - TECH Atlantic**

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**APPENDIX A**  
**PROJECT SCHEDULE**

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# Water Installation at Calverton NY

ID	Task Name	% Complete	Duration	Start	Finish	2012											
						Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	<b>Water Installation Project</b>	72%	350 days	Tue 8/30/11	Mon 8/13/12												
2	Contract Award	100%	0 days	Tue 8/30/11	Tue 8/30/11												
3	Notice to Proceed	100%	0 days	Wed 9/14/11	Wed 9/14/11												
4	Contract / Project Kick-off Meeting / Formal Site Visit	100%	1 day	Wed 9/14/11	Wed 9/14/11												
5	Prepare DRAFT version Work Plan with Waste Management Plan and Health & Safety Plan	100%	22 days	Thu 9/15/11	Fri 10/14/11												
6	<a href="#">Submit DRAFT version Work Plan with Waste Management Plan and Health &amp; Safety Plan</a>	100%	0 days	Fri 10/14/11	Fri 10/14/11												
7	Navy review of the DRAFT Work Plan	100%	14 days	Tue 10/18/11	Sun 11/6/11												
8	<i>Receive Navy comments on DRAFT plans</i>	100%	0 days	Mon 11/7/11	Mon 11/7/11												
9	Incorporate comments from Navy into DRAFT plans	100%	25 days	Mon 11/7/11	Tue 12/13/11												
10	Prepare response to Navy comments	100%	26 days	Wed 12/14/11	Fri 1/20/12												
11	<a href="#">Submit DRAFT FINAL plans</a>	100%	0 days	Fri 1/27/12	Fri 1/27/12												
12	Navy and Regulatory review of DRAFT FINAL plans	100%	53 days	Mon 1/30/12	Wed 4/11/12												
13	<i>Receive Navy and Regulator comments on DRAFT FINAL plans</i>	100%	0 days	Thu 4/12/12	Thu 4/12/12												
14	Incorporate comments from Navy and Regulator into Draft FINAL plans for the Final version	82%	11 days	Fri 4/13/12	Fri 4/27/12												
15	<a href="#">Submit FINAL version Work Plan with Waste Management Plan as Attachment and Health &amp; Safety Plan</a>	0%	0 days	Fri 4/27/12	Fri 4/27/12												
16	Mobilize, establish laydown area, and install silt fence	0%	2 days	Tue 5/29/12	Wed 5/30/12												
17	Complete service connection at existing RPZ and new water line service installation including curb stops and yard hydrants	0%	11 days	Thu 5/31/12	Thu 6/14/12												
18	Complete hydrostatic and disinfection testing	0%	2 days	Fri 6/15/12	Mon 6/18/12												
19	Complete connections to existing services and begin restoration	0%	2 days	Tue 6/19/12	Wed 6/20/12												
20	Complete well abandonment	0%	2 days	Thu 6/21/12	Fri 6/22/12												
21	Remove silt fence, complete site restoration, and demobe	0%	2 days	Fri 6/22/12	Mon 6/25/12												
22	Prepare DRAFT version Construction Completion Report	0%	14 days	Tue 6/26/12	Mon 7/16/12												
23	<a href="#">Submit DRAFT version Construction Completion Report</a>	0%	0 days	Mon 7/16/12	Mon 7/16/12												
24	Navy and Regulator review of Draft Report	0%	10 days	Tue 7/17/12	Mon 7/30/12												
25	<i>Receive Navy and Regulator comments on Draft report</i>	0%	0 days	Mon 7/30/12	Mon 7/30/12												
26	Incorporate comments and update for Final Report	0%	10 days	Tue 7/31/12	Mon 8/13/12												
27	<a href="#">Submit FINAL version Construction Completion Report</a>	0%	0 days	Mon 8/13/12	Mon 8/13/12												

Project: Water Installation Project  
Date / Run Time: Wed 4/25/12 3:44 PM

Task Progress Milestone Summary

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**APPENDIX B**

**DRAWINGS/DESIGN AND TECHNICAL SPECIFICATIONS PROVIDED BY THE NAVY**

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**Design Package for  
Installation of Water Service to Peconic River Sportsman's Club,  
Suffolk County, New York, Revision 1**

**CONTENTS**

**Technical Specifications**

<b>Section 31 00 00</b>	<b>Excavation, Backfill, and Compaction (Earthwork)</b>
<b>Section 33 11 01</b>	<b>Water Service</b>
<b>Section 33 20 00</b>	<b>Well Abandonment</b>

**Drawings**

<b>G-1</b>	<b>Cover Sheet</b>
<b>C-1</b>	<b>Site Utility Plan</b>
<b>C-2</b>	<b>Legend and Details</b>
<b>C-3</b>	<b>Site Details</b>
<b>C-4</b>	<b>Site Details</b>
<b>L-1</b>	<b>Landscape Plan and Details</b>



Unauthorized alteration or addition to this report is a violation of Section 7209 of the New York State State Education Law, unless the person is acting under the direction of a licensed professional engineer.

## SECTION 31 00 00

### EXCAVATION, BACKFILL, AND COMPACTION (EARTHWORK)

#### PART 1 – GENERAL

##### 1.1 SCOPE OF WORK

This Section covers the requirements for performing the following work, as shown on the Contract Drawings and as specified:

- A. Excavating, backfilling, and compacting for structures, piping, and utilities.
- B. Site grading
- C. Restoration of surfaces.
- D. All other related and incidental work.

All work within this section should adhere to the New York State Department of Transportation's (NYSDOT) 2008 Standard Specifications, as updated, unless specified by the Construction Drawings, Technical Specifications, or geotechnical report, or as directed in the field.

If earthwork measurement and payment items are not specified in the project manual, the Contractor shall use NYSDOT's 2008 Standard Specifications, as updated, as a basis for measurement and payment of earthwork.

##### 1.2 RELATED SECTIONS

31 11 01 Water Service

##### 1.3 REFERENCES

The following publications form a part of this specification for guidance to the extent referenced. These publications shall be the latest edition and are referred to in the text by their basic designation only.

###### American Society for Testing and Materials (ASTM)

ASTM D 698	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D 1556	Density and Unit Weight of Soil in Place by the Sand Cone Method
ASTM D 2922	Density of Soil and Soil Aggregate in Place by Nuclear Methods

###### Code of Federal Regulations (CFR)

29 CFR 1926.360, .651, .652, and .653

###### State of New York Department of Transportation (NYSDOT)

2008 Standard Specifications for Construction, as amended

###### State of New York Department of Environmental Conservation

New York State Standards and Specifications for Erosion and Sediment Control handbook,  
August 2005

#### 1.4 SUBMITTALS

Submit the following before bringing off-site borrow material to the site:

- A. Product Data: Name of fill material sources and suppliers.
- B. Laboratory Data: Maximum dry density test results (according to ASTM D 698) as outlined in paragraph 3.9.A for material used as bedding, embedment, fill, or backfill material.
- C. Field density test results (according to ASTM D 1556 or ASTM D 2922) as outlined in paragraph 3.9.B for material used as bedding, embedment, fill, or backfill material.

#### 1.5 DEFINITIONS

- A. Unstable material - Debris, topsoil, peat and materials containing peat; and, all wet, soft or loose material that will not remain in position when cut for excavation, or that does not provide sufficient bearing capacity to satisfactorily support structures.
- B. Unsuitable material - Excavated material that does not meet Specification requirements for backfilling, to include unstable material or angular stones.
- C. Common Fill or Native Material - On-site or imported material that is considered suitable by the Contracting Officer for trenching or berming.
- D. Sand Bedding - Granular material consisting of sand and non-angular stones < 1.0" in diameter for surrounding pipes and culverts during trench installation. Native material is acceptable as bedding if meets this standard.
- E. Select Fill - Sand, gravel and similar material free of clay, loam, organic material and debris containing stones, pebbles or lumps less than two inches in greatest dimension.
- F. Asphalt or Gravel Road Reconstruction – As shown on the drawings.
- G. Loam/Topsoil Composition – Tree cover areas: Rake and set aside sticks, stones, roots, pine tree droppings, and other natural debris for ground cover replacement. For turf areas (main lodge and main gate), maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen, conforming to the following limits:

Sand	25-60%
Silt	15-25%
Clay	4-12%
pH	5.5 to 7.0
Soluble Salts	600 ppm maximum

Loam/Topsoil shall contain a "low" percent organic matter and silt/clay, similar to that of existing conditions. These limits may be modified as recommended by a nursery, testing laboratory, or the Sportsman's Club.

- H. Seeding/Sedging – In tree cover areas, rake in the set-aside ground cover debris. If grasses were disturbed, lightly apply a native mix that matches existing nearby conditions. Do not turf or introduce non-native species in tree cover areas unless directed. Steep, sandy slopes trenched at the pistol range may require sedge grasses to prevent erosion (similar to sand dune restoration). Where turf is established (main lodge and main gate), apply a turf formula that matches the existing turf. Seed/sedge mix/type/rate is subject to review and approval of the Sportsman's Club in all areas (natural or turf areas).

## **1.6 PROPERTY PROTECTION AND SAFETY**

- A. Buildings, poles, roadways, walkways, landscape vegetation, and all other property shall be protected unless their removal is authorized.
- B. The Contractor shall contact underground utility locator service to locate and mark all utilities prior to commencing work. If any unknown utilities are encountered during excavation, the Contractor shall immediately notify the Contracting Officer. The Contractor shall preserve intact any utilities encountered.
- C. The Contractor shall maintain safe passage for local traffic and provide all necessary barricades, warning lights, signs, signals, and flagmen where required.
- D. All excavation work shall comply with 29 CFR 1926.650, 1926.651, 1926.652, and 1926.653.

## **1.7 EROSION AND SEDIMENT CONTROLS**

The Contractor shall comply with all erosion and sediment control requirements shown on the drawings and shall follow all the requirements of the NY State Standards and Specifications for Erosion and Sediment Control Handbook, August 2005.

## **PART 2 – PRODUCTS**

### **2.1 MATERIALS**

- A. All fill material shall be free of contamination. All off-site borrow shall be clean, virgin material. The Contractor shall provide evidence, satisfactory to the Contracting Officer, documenting that the material is free of contamination. The Contracting Officer may collect random samples of fill material to verify that it is uncontaminated.
- B. Bedding material for piping and utilities shall be sand bedding.
- C. Backfill material over bedding material for piping and utilities shall be common borrow or native material, or as otherwise specified on the drawings.
- D. Land cover shall be restored to its original condition. Turf lawn areas shall be restored with topsoil and seed, and roads shall be restored with asphalt or gravel.
- E. If work is performed near or under building foundations, backfill material for structures shall be select fill.

## **PART 3 – EXECUTION**

### **3.1 CLEARING**

Before the removal of topsoil and commencing excavation, the surface areas within the grading limits shall be cleared of all vegetation, rubbish, and other objectionable. Cleared material shall be properly disposed of off-site in accordance with all Local, State, and Federal regulations.

### **3.2 EXCAVATING**

- A. Excavation of soil shall be performed by any practicable method consistent with maintaining the integrity and protection of the work, workers, and the public.
- B. Excavation shall be kept dry and no surface water runoff from precipitation and groundwater infiltration shall be allowed to collect in the excavation.
- C. Excavating operations shall include the removal of all materials encountered within the required widths and depths of the excavation, regardless of the nature of the materials, the condition of the materials at the time they are excavated, or the manner in which they are excavated.
- D. Excavated materials meeting the requirements of these Specifications may be used as backfill material.
- E. Stockpiled material shall not obstruct roads, ditches, or drainage swales.
- F. All trash, debris, and excess excavated material shall be disposed offsite in accordance with all Local, State and Federal regulations.
- G. Unstable material in excavations shall be removed to the extent and depths as required, or as directed by the Contracting Officer. Whenever the material encountered is in the Contractor's opinion unstable, he shall immediately notify the Contracting Officer to make a determination whether the soil is suitable for support. All notifications shall be substantiated in writing by the Contractor.
- J. The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 16 inches (8 inches per side) to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Contractor shall not over excavate.
- H. Pipe trenches shall be excavated so that pipes can be laid straight at uniform grade without deflection.
- I. If suspected contaminated soil or materials are encountered, the Contractor shall cease operations and notify the Contracting Officer for further instructions.

### **3.3 BACKFILLING AND COMPACTING FOR PIPE TRENCHES**

- A. Unless otherwise directed, excavations shall be backfilled as soon as possible after structures are built or pipes are laid; and the work is inspected, tested as required, and accepted; and when permission to backfill has been given by the Contracting Officer. Prior to backfilling, all rubbish, debris, forms and similar materials shall be removed from the excavation or trench. Backfilling shall not be done in freezing weather, with frozen materials, or when in-place materials are frozen.

- B. The excavation shall be filled to the proper grade with approved material. The fill shall be compacted according to the requirements stated in the drawings.
- C. Backfill shall be brought up to adjacent finished grade minus the depth of any required top soil or gravel. Any excavations improperly backfilled, shall be reopened to the depth required for proper compaction, and shall then be refilled and properly compacted with the surface restored to required grade.
- D. When crossing roads, each layer of backfill material shall be compacted to the density specified on the drawings. Compaction densities shall be the percentage of the maximum dry density obtainable at optimum moisture content, as determined by ASTM D 698 and as listed on the Drawings. Field density tests shall be made in accordance with ASTM D 1556 or D 2922. The moisture content of each layer of back fill shall be controlled as required.
- E. Failure of the compacted material to reach the required density is cause for rejection of the work in the affected area(s). Unless the Contractor can rework and compact the material to the required density, the Contractor shall remove the material in the areas affected. Subsequently, the Contractor shall replace the rejected work with material that can be compacted to the required density. Field density tests and rejection of the non-compliant compacted material shall be repeated until test results are accepted by the Contracting Officer.
- F. Pipe shall be laid with not less than 120 degrees of the lower part of the pipe bearing on bedding material.

### **3.4 FILLING, BACKFILLING AND COMPACTING FOR STRUCTURES**

If work is required near the foundation for tie-in, backfill for foundation walls and footings shall be placed in lifts not to exceed six (6) inches compacted to not less than 95% maximum dry density (ASTM D 698). Puddling or water flooding for consolidating the backfill will not be allowed.

### **3.5 SITE GRADING**

Areas to be graded shall be made reasonably smooth, compacted and free of irregular surface changes. Unless otherwise specified, the degree of finish shall be that ordinarily obtainable from motor grader operations.

### **3.6 RESTORATION OF SURFACES**

- A. Damaged or disturbed surfaces shall be restored to a condition that equals or exceeds the surface condition prior to construction.
- B. Seed/sedge as described in Part 1.5, "Definitions".
- C. Finished surfaces shall be thoroughly rolled and shall match adjacent surfaces as nearly as practicable.
- D. The finished surfaces over trenches shall be left slightly mounded.

### **3.7 CONSTRUCTION TESTING**

Construction testing for Earthwork will not be required; however the Navy reserves the right to request the following testing procedures if it feels the Work is not being performed adequately. Testing will be done at the expense of the Contractor.

A. Laboratory testing

One laboratory maximum dry density test (ASTM D 698) shall be performed for each material to be used as bedding or backfill material.

B. Field testing

Field density tests shall be performed according to ASTM D 1556 or ASTM D 2922.

1. One test per lift for each 250 linear feet of trench bedding and backfill material.
2. One test per lift for each 20 linear feet of footing and foundation wall backfill material.
3. One test per lift for each 100 square feet of slab subgrade material.

END OF SECTION

## SECTION 33 11 01

### WATER SERVICE

#### PART 1 – GENERAL

##### 1.1 SCOPE OF WORK

Provide water service lines indicated as 2 inch line from water distribution main to building service at the points indicated. The water service line includes connecting to the RPZ vault, installing the 2" service line, all building tie-in's, yard hydrants, curb stops, and other appurtenances, and testing the system. Work begins on the service side of the RPZ, and ends on the outside face of the buildings.

##### 1.2 RELATED SECTIONS

31 00 00 Excavation, Backfill, and Compaction

##### 1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

#### NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH)

Part 5, Subpart 5-1 Public Water Systems

#### AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA B300 (2004) Hypochlorites  
AWWA C651 (2005; Errata 2005) Standard for Disinfecting Water Mains  
AWWA C800 (2005) Underground Service Line Valves and Fittings  
AWWA C901-08 HDPE pipe (1/2" through 3")

#### ASME INTERNATIONAL (ASME)

ASME B16.22 (2001; R 2005) Standard for Wrought Copper and Copper Alloy Solder Joint Pressure Fittings  
ASME B16.26 (2006) Standard for Cast Copper Alloy Fittings for Flared Copper Tubes

#### ASTM INTERNATIONAL (ASTM)

ASTM B 42 (2002e1) Standard Specification for Seamless Copper Pipe, Standard Sizes  
ASTM B 88 (2003) Standard Specification for Seamless Copper Water Tube

ASTM D 3035-03a	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
ASTM D 2774-04	Standard Practice for Underground Installation of Thermoplastic Pressure Piping
ASTM D 3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Butt Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM F 1055	Standard Specification for Electrofusion Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
ASTM F 2164	Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
ASTM F 2620	Standard Practice for Heat Fusion of Polyethylene Pipe and Fittings

#### **1.4 SUBMITTALS**

The following shall be submitted:

Product Data: Water service line piping, fittings, joints, valves, couplings, corporation stops, and valve boxes. Include information concerning gaskets with submittal for joints and couplings.

Test Reports: Bacteriological Disinfection.

O&M / Manufacturer's Instructions: Manufacturer Instructions and data sheets for installation of HDPE pipe, joining HDPE pipe, joining HDPE pipe to copper pipe, and pressure testing HDPE pipe.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

##### **1.5.1 Delivery and Storage**

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials on site in enclosures or under protective covering. Store jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves free of dirt and debris.

##### **1.5.2 Handling**

Handle pipe, fittings, valves, and other accessories in a manner to ensure delivery to the trench in sound undamaged condition. Take special care to avoid injury to coatings and linings on pipe and fittings; make repairs if coatings or linings are damaged. Carry, do not drag pipe to the trench. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Government. Lines shall be laid as straight as possible and the Contractor shall not kink or crimp the line.

## **PART 2 – PRODUCTS**

### **2.1 WATER SERVICE LINE MATERIALS**

#### **2.1.1 Piping Materials**

2.1.1.1 Copper Pipe and Associated Fittings: Pipe, ASTM B 42, regular, threaded ends. Fittings shall be brass or bronze, ASME B16.15, 125 pound.

2.1.1.2 Copper Tubing and Associated Fittings: Tubing, ASTM B 88, Type K. Fittings for solder-type joint, ASME B16.18 or ASME B16.22; fittings for compression-type joint, ASME B16.26, flared tube type.

2.1.1.3 HDPE Piping: Both pipe and fittings shall carry the same pressure rating. All fittings shall be pressure rated to match the system piping to which they are joined. The HDPE pipe shall be rated for potable water and shall be rated for a minimum pressure of 160 psi. No broken, cracked, misshapen or damaged, material shall be used.

2.1.1.4 Insulating Joints: Joints between pipe of dissimilar metals shall have a rubber-gasketed or other suitable approved type of insulating joint or dielectric coupling which will effectively prevent metal-to-metal contact between adjacent sections of piping.

#### **2.1.2 Water Service Line Appurtenances**

2.1.2.1 Curb or Service Stops: Ground key, round way, inverted key type; made of bronze, ASTM B 61 or ASTM B 62; and suitable for the working pressure of the system. Ends shall be as appropriate for connection to the service piping. Arrow shall be cast into body of the curb or service stop indicating direction of flow.

2.1.2.2 Curb Boxes: Provide a curb box for each curb or service stop. Curb boxes shall be of cast iron of a size suitable for the stop on which it is to be used. Provide a round head. Cast the word "WATER" on the lid. Each box shall have a heavy coat of bituminous paint.

2.1.2.3 Service Clamps: Service clamps used for repairing damaged cast-iron, steel, PVC or asbestos-cement pipe shall have a pressure rating not less than that of the pipe to be connected and shall be either the single or double flattened strap type. Clamps shall have a galvanized malleable-iron body with cadmium plated straps and nuts. Clamps shall have a rubber gasket cemented to the body.

2.1.2.4 Dielectric Fittings: Dielectric fittings shall be installed between threaded ferrous and nonferrous metallic pipe, fittings and valves, except where corporation stops join mains. Dielectric fittings shall prevent metal-to-metal contact of dissimilar metallic piping elements and shall be suitable for the required working pressure.

2.1.2.5 Tapping Sleeves: Provide Tapping Sleeves where required.

2.1.2.6 Frost Proof Yard Hydrants: Provide Frost Proof Yard Hydrants that are lead free, bury length 4.5 feet, overall length 105 inches, head material cast iron, connections/spout  $\frac{3}{4}$  in Aluminum, with siphon break, extension rod Eco Brass, rod size 7/17 in, handle cast iron, self draining bleeder valve, plunger one piece molded Buna N, include snap lock, with 1 inch galvanized riser, and padlock locator handle to head.

2.1.2.7 Disinfection: Chlorinating materials shall be Hypochlorite, Calcium or Sodium, per AWWA B300, or as specified by New York State Department of Health (NY DOH).

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION OF SERVICE PIPELINES**

**3.1.1 Location of Water Lines:** Connect water service piping to the building service where the building service has been installed. Where water piping is required to be installed within 5 feet of existing structures, the water pipe shall be sleeved. The Contractor shall install the water pipe and sleeve ensuring that there will be no damage to the structures and no settlement or movement of foundations or footings.

Adhere to the water-sewer separation standards as depicted on the Construction Drawings and the "Recommended Standards for Water Works", 2007 Edition. Where the location of the water line is not clearly defined by dimensions on the drawings, do not lay water line closer horizontally than 10 feet from any sewer line. Where water lines cross under gravity sewer lines, encase sewer line fully in concrete for a distance of at least 10 feet on each side of the crossing. No water piping shall pass through or come in contact with any part of a sewer manhole.

Do not lay water lines in the same trench with gas lines, fuel lines, or electric wiring. Copper tubing shall not be installed in the same trench with ferrous piping materials. Where nonferrous metallic pipe, e.g. copper tubing, cross any ferrous piping, provide a minimum vertical separation of 12 inches between pipes.

**3.1.2 Earthwork:** Perform earthwork operations in accordance with Section 31 00 00 "Excavation, Backfill, and Compaction".

**3.1.3 Pipe Laying and Jointing:** Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories, and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Do not under any circumstances drop or dump pipe, fittings, valves, or any other water line material into trenches. Cut pipe in a neat workmanlike manner accurately to length established at the site and work into place without springing or forcing. Grade the pipeline in straight lines; avoid the formation of dips and low points. Support pipe at proper elevation and grade. Secure firm, uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where indicated and where necessary for fastening work into place. Make proper provision for expansion and contraction of pipelines. Keep trenches free of water until joints have been properly made. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather prevent installation. Depth of cover over top of pipe shall not be less than 4'-6" feet (54 inches). The depth of cover shall be maintained uniform with respect to finish grade.

1. Field cuts may be made for shorter than standard pipe lengths. If required, Contractor shall field cut HDPE pipe with proper tool, machine, or tool and machine. Contractor shall not cut pipe by burning and shall not crimp HDPE pipe. Pipe ends shall be saw cut square and perpendicular to pipe axis. Contractor shall examine cut ends for damage caused by cutting and shall finish cut ends of pipe. Contractor shall finish cut ends of HDPE pipe for thermal butt fusion joints in accordance with manufacture's recommendations.
2. Contractor shall provide services of HDPE pipe and fitting manufacturer's representative as required to obtain correct installation of HDPE pipe and fittings. This assistance shall be provided at no additional cost to the Owner.
3. Provide pipe embedment material around pipe as per standard detail on drawing. Place embedment material so that pipe is uniformly supported along its length, do not drop pipe and fittings into trench, do not drag pipe in manner which causes scratching of pipe surface, excessive gouging of pipe surface will be cause for rejection. Clean each pipe and fitting of foreign material (including dirt)

before placing in trench and keep clean during jointing process. Should deleterious materials/dirt, or damaged pipe be observed in previously installed pipe, cease work until material is removed or damaged pipe removed and replaced. Close open ends of pipe and fittings with a watertight seal during periods when work is not in progress

4. Provide thrust blocks at bends, tees, and mechanical couplings as per the drawing detail.
5. Backfill remainder of trench with previously excavated material, install detectable warning tape as per trench detail. Compact material to 95% of dry density where noted on the drawings or specifications.

**3.1.4 Connections to Existing Water Lines:** Make connections to existing water lines after approval is obtained. Interruption of service on the existing line shall be kept to a minimum. Make connections to existing lines under pressure in coordination with and in accordance with the standard practices of Riverhead Water District (RWD). Inform and coordinate with RWD prior to making any connections. Connections can be made only in the presence of a RDW representative. RDW Contact Information: Gary J. Pendzick, Superintendent (Phone #: 631-727-3205).

- A. Prior to pipe installation dig test pits to determine size, type, and exact location of existing pipe to which proposed pipe will connect.
- B. Prior to pipe installation, excavate sufficient trench in advance and test pit existing underground utilities/structures (shown on drawings or visually identified in the field), and resolve conflicts, as approved by Engineer.

**3.1.5 Penetrations:** Pipe passing through walls of valve pits and structures shall be provided with Schedule 40 steel wall sleeves. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

**3.1.6 Flanged Pipe:** Not Used.

**3.1.7 Service Line Connections to Water Mains:** A service tap should already be present on the water mains to which the service line will be connected.

**3.1.8 Metallic Pipe Jointing:**

- A. Screwed Joints: Make screwed joints up tight with a stiff mixture of graphite and oil, inert filler and oil, or graphite compound; apply to male threads only. Threads shall be full cut; do not leave more than three threads on the pipe exposed after assembling the joint.
- B. Joints for Copper Tubing: Cut copper tubing with square ends; remove fins and burrs. Handle tubing carefully; replace dented, gouged, or otherwise damaged tubing with undamaged tubing. Make solder joints using ASTM B 32, 95-5 tin-antimony or Grade Sn96 solder. Solder and flux shall contain not more than 0.2 percent lead. Before making joint, clean ends of tubing and inside of fitting or coupling with wire brush or abrasive. Apply a rosin flux to the tubing end and on recess inside of fitting or coupling. Insert tubing end into fitting or coupling for the full depth of the recess and solder. For compression joints on flared tubing, insert tubing through the coupling nut and flare tubing.

**3.1.9 HDPE Pipe Cutting & Joining:** Field cuts may be made for shorter than standard pipe lengths. If required, Contractor shall field cut HDPE pipe with proper tool, machine, or tool and machine. Contractor shall not cut pipe by burning and shall not crimp HDPE pipe. Pipe ends shall be saw cut square and perpendicular to pipe axis. Contractor shall examine cut ends for damage caused by cutting and shall finish cut ends of pipe. Contractor shall finish cut ends of HDPE pipe for thermal butt fusion joints in accordance with manufacture's recommendations.

Contractor shall provide services of HDPE pipe and fitting manufacturer's representative as required to obtain correct installation of HDPE pipe and fittings. This assistance shall be provided at no additional cost to the Owner.

**3.1.10 Disinfection:** Before the line is put into service, all the piping and all appurtenances shall be thoroughly disinfected. Prior to disinfection, obtain Contracting Officer approval of the proposed method for disposal of waste water from disinfection procedures. Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C651. Fill piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with domestic water until maximum residual chlorine content is within the range of 0.2 and 0.5 parts per million, or the residual chlorine content of domestic water supply. All valves in the lines being disinfected shall be opened and closed several times during the contact period, individual service lines shall be opened momentarily to flush each service with chlorinated water.

Obtain at least two consecutive satisfactory bacteriological samples from new water piping, analyze by a certified laboratory, and submit the results prior to the new water piping being placed into service. After the water system has been disinfected and thoroughly flushed, the Contractor shall take samples of water from four remote points of the distribution system and shall forward the samples to a Navy approved laboratory for bacterial examination. If tests of such samples indicate the presence of coliform organisms, the disinfection shall be repeated until tests indicate the absence of such organisms. The bacterial tests shall be satisfactorily completed before the new system is connected to the existing system and placed in operation.

It shall be the Contractor's responsibility to obtain satisfactory samples. The Contractor shall submit the test results to Suffolk County Department of Health Services for approval.

## **3.2 FIELD QUALITY CONTROL**

### **3.2.1 Field Tests and Inspections**

Prior to hydrostatic testing, obtain Contracting Officer approval of the proposed method for disposal of waste water from hydrostatic testing. The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests, and provide labor, equipment, and incidentals required for testing, except that water and electric power will be furnished. The Contractor shall produce evidence, when required, that any item of work has been constructed in accordance with the drawings and specifications. Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete.

### **3.2.2 Testing Procedure**

Following installation of the piping and appurtenances, the waterlines shall be flushed to remove any foreign matter. Flushing water shall be with clean and potable, and flushing shall continue until water runs clean. The Contractor shall dispose of the flushing water without causing a nuisance or property damage.

All components of the water distribution system, including fittings and valves shall be hydrostatic tested. Hydrostatic pressure leak tests of PE pressure piping systems should be conducted in accordance with ASTM F 2164. The pipe shall be hydrostatically testing at a pressure of 150 psig for a period of not less than 2 hours. Other than initial fluctuations at the start of the test, no change in the applied pressure shall be observed during the entire two-hour test. Pipes/joints that fail the pressure test shall be repaired/replaced at the contractors expense and retested.

### **3.3 CLEANUP**

Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

END OF SECTION

## **SECTION 33 20 00**

### **WELL ABANDONMENT PART 1 – GENERAL**

#### **1.1 SCOPE OF WORK**

Well abandonment is that procedure by which any monitoring well is permanently closed. Abandonment procedures are designed to prevent fluids from entering or migrating within the well. Therefore, an abandoned monitoring well must be sealed in such a manner that it cannot act as a conduit for migration of contaminants from the ground surface to the water table or between aquifers. It is important that the appropriate state or local agency be notified of monitoring well abandonment.

An abandoned well shall be filled and sealed so that it will not act as a pathway for the interchange of water between the surface and subsurface or present a hazard to human health or the environment. The Contractor shall decommission four wells that are shown on the drawings.

#### **1.2 RELATED SECTIONS**

none

#### **1.3 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

1. The Contractor shall follow all well abandonment requirements listed in the NYS DOH Individual Water Supply Wells – Fact Sheet #4 (Decommissioning Abandoned Wells).

#### **1.4 SUBMITTALS**

The following shall be submitted:

1. Name, resume, and registration number of well driller registered in the state of New York who will be performing the well decommissioning work.
2. Step-by-step procedure that will be used for well decommissioning.
3. Data sheets for materials that will be used during well abandonment including but not limited to cement, bentonite, and sand.

### **PART 2 – PRODUCTS**

#### **2.2 WELL SEALING MATERIALS**

Acceptable sealing materials include concrete, portland cement grout, sodium-base bentonite clay, or combinations of these materials. These materials are defined as follows:

1. Concrete may be used for filling the upper part of a well or water bearing formation, or plugging short sections of casing and filling large diameter wells.
2. Portland cement grout is superior for sealing small openings, penetrating any annular space outside the casing, and for filling voids in the surrounding formation. Portland cement grout shall be composed of one bag of Type I cement per 6 to 8 gallons of water. Two parts sand to one part cement may be added.
3. Bentonite clay, when applied as a heavy mud-laden fluid under pressure, has most of the advantages of cement grout, but under some conditions may be carried away into the

surrounding formation. A bentonite clay mixture shall be composed of not less than 2 pounds of clay per gallon of water

4. Fill materials include clay, silt, sand, gravel, crushed stone, or a mixtures of these materials may be used as a filler in sealing a well when used in conjunction with the sealing materials described above. Organic material may not be used and fill material may be required to be disinfected or certified clean prior to use.
5. Spent drilling muds or drill cuttings are not to be used to seal a well.

## **PART 3 – EXECUTION**

### **3.1 PRELIMINARY CONSIDERATIONS**

The Contractor shall use the services of a well driller registered in the State of NY for well abandonment activities.

Several factors should be considered to determine the appropriate well abandonment method. These factors include:

- i) Conditions of the well,
- ii) Details of well construction, including casing material, diameter of casing, depth of well, and well plumbness,
- iii) Obstructions within the well that may interfere with filling or sealing,
- iv) Level of contamination and the zone or zones where it occurs.
- v) Hydrogeologic setting, and
- vi) Regulatory requirements.

Degraded wells may not permit casing removal by pulling. Also, the casing material may dictate whether a casing can be removed intact. Stainless steel will have a higher tensile strength than PVC and may hold together while pulling the casing; PVC well casing may break under pulling and may need to be overdrilled to remove it. The depth of the well and well plumbness may limit casing removal depending on whether a casing is pulled or overdrilled. In some cases, casings can be left in-place if they are properly filled with appropriate backfill. The formation lithology influences the selection of casing removal. Unconsolidated materials can be drilled with hollow-stem augering techniques whereas consolidated materials cannot. Unconsolidated materials may also cave-in during well casing removal.

### **3.2 FILLING AND SEALING PROCEDURES**

The Contractor shall remove the well pump, drop pipe, electrical controls, and all conduits from the well casing prior to abandonment. Grouting shall be performed so as to match the grout to emplacement and not leave any voids.

Drilled wells (all wells not dug) shall be filled with sealing material or a combination of sealing material and fill material. In some cases, well casing removal is necessary for well abandonment. If the borehole is unstable and may cave-in, sealing material will be emplaced simultaneously during casing removal. If the well is not grouted, casing may be pulled with hydraulic jacks or a drilling rig. It may also be pulled by sandlocking. Sandlocking consists of lowering a pipe wrapped with burlap approximately 2/3 of the well depth and filling the burlap wrap with sand. The pipe is slowly lifted and locks the sand, pulling the casing. Well casings can also be removed by overdrilling. Wells can be overdrilled with larger diameter hollow stem or solid stem augers or direct rotary techniques, using air or mud. Augers used for overdrilling should be at least 2 inches larger in diameter than the diameter of the well casing.

If well casing is in poor condition or is grouted in place, the casing may be ripped or perforated and filled and pressure grouted in place.

Abandoned wells shall be filled with the appropriate filling and sealing material placed from the bottom of the well upward. When Portland cement grout or concrete is used, it shall be placed in continuous operation using a tremie pipe. Sealing material shall be placed in the interval or intervals to be sealed by methods that prevent free fall, dilution, and/or separation of aggregates from cementing material.

A well constructed in unconsolidated material in an unconfined groundwater zone shall be filled and sealed by placing fill material in the well to the level of the water table, and filling the remainder of the well with sealing material.

After filling, the upper three feet of well casing shall be removed.

### **3.3 CLEANUP**

Upon completion of the well decommissioning the area around the well shall be cleaned of any debris and shall be graded so that surface water runoff will be away from the decommissioned well.

END OF SECTION



## INDIVIDUAL WATER SUPPLY WELLS - FACT SHEET #4 DECOMMISSIONING ABANDONED WELLS

Drinking water wells and other types of wells that are no longer in use can pose safety hazards, especially to small children and pets. These abandoned wells can also serve as pathways for contamination to enter groundwater. Abandoned wells should be properly decommissioned to eliminate these potential hazards. The Department recommends wells be decommissioned using the methods described below.

### Well Decommissioning Methods

Prior to abandonment of any well the pump, drop pipe, electrical controls, etc. must be removed from the casing. Leaving these items inside the well casing will cause voids when filling the well, which may increase the possibility of contamination of the well and local aquifers.

- **Driven Points** made of small diameter pipe should be pulled out of the ground. The hole should be filled with grout if possible. The area should be graded so that surface water flows away from the abandoned well location.
- **Dug wells** should be back filled with soil similar to surrounding soils, and compacted to match the surrounding soils. Broken concrete, wood, or other debris should NOT be used as backfill. Prior to back filling, the side wall lining of the dug well should be removed to the full depth if safety can be maintained or to at least four feet below ground level. Dug wells that have penetrated fractured rock should have a cement or grout seal placed in the rock section prior to back filling. After back filling, the area should be graded so that surface water flows away from the abandoned well location.
- **Drilled wells** can be difficult to decommission properly. Whenever practical, the well casing should be pulled out of the ground or overdrilled, and the length of the drill hole sealed with grout. When full casing removal is impractical, the entire length of the drillhole including casing interior should be grouted, and the casing cut off at least four feet below ground. Well casings that penetrate multiple aquifers should be perforated prior to pressure grouting the interior. After back filling, the area should be graded so that surface water flows away from the abandoned well location.
- **Artesian wells, wells in creviced rock such as limestone, and wells penetrating multiple aquifers** pose the most difficult decommissioning procedures. The Department recommends that well drillers follow the procedures found in American Water Works Association Standard A100 "AWWA Standard for Water Wells".

## **Using Grouts**

The proper use of grout in decommissioning a well can provide the best protection against contaminant migration. Effective grouting requires careful placement to ensure no voids are left in the well and that the seal is complete. Registered well drillers can ensure proper grout selection and installation.

Grout is a material that has a low permeability, such as neat cement, bentonite slurry, bentonite chips, bentonite pellets, granular bentonite, or other materials that have equivalent sealing properties. Numerous grout products are available, and a proper match of grout to method is essential.

## **Regulatory Requirements**

In some locations, one or more regulatory agencies and/or municipalities may have specific requirements for decommissioning abandoned water wells. The Local Health Department should be consulted for information on regulatory requirements prior to decommissioning.

State regulations require that anyone engaged in the business of water well drilling in the state of New York first obtain a certificate of registration from the Department of Environmental Conservation (DEC). Water well drilling activities covered by this regulation include well decommissioning.

## **Registered Well Drillers**

The decommissioning of abandoned individual water supply wells can be difficult and dangerous. Though decommissioning may be done by the homeowner, it is strongly recommended that the services of a DEC registered well driller be obtained.

A list of DEC registered well drillers can be found at:

**[http://www.dec.state.ny.us/website/dow/driller\\_ext.html](http://www.dec.state.ny.us/website/dow/driller_ext.html)**

Appendix 5-B can be found at:

**<http://www.health.state.ny.us/nysdoh/water/part5/appendix5b.htm>**

## **For questions concerning this Fact Sheet or a copy of Appendix 5-B:**

Contact your Local Health Department      or      Residential Sanitation Section  
Bureau of Water Supply Protection  
New York State Department of Health  
(518) 402-7650 or FAX (518) 402-7659  
E-mail: [bpwsp@health.state.ny.us](mailto:bpwsp@health.state.ny.us)

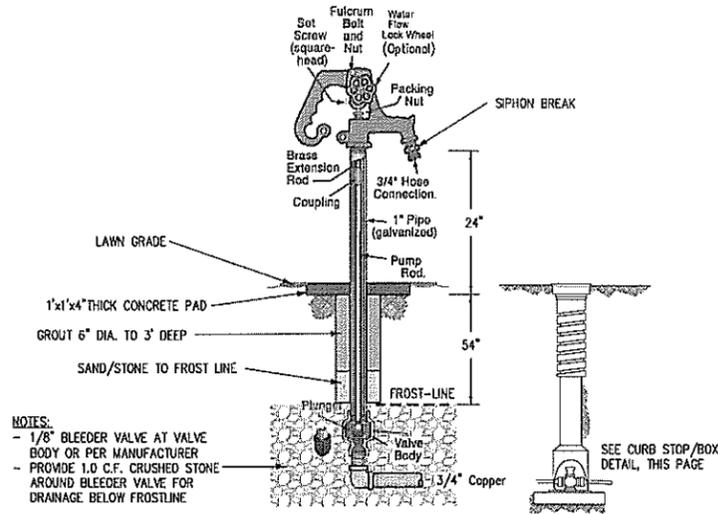






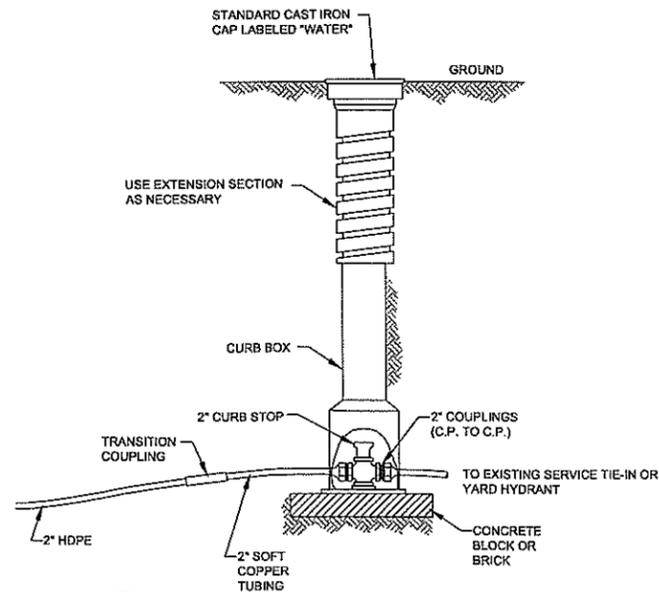


Unauthorized alteration or addition to this plan is a violation of Section 7209 of the New York State Education Law, unless the person is acting under the direction of a licensed professional engineer. Any plan alterations by another engineer must be marked as such, including the signature and seal of the altering engineer.



- NOTES:**
- 1/8" BLEEDER VALVE AT VALVE BODY OR PER MANUFACTURER
  - PROVIDE 1.0 C.F. CRUSHED STONE AROUND BLEEDER VALVE FOR DRAINAGE BELOW FROSTLINE

1 **DETAIL: FROST-PROOF YARD HYDRANT W/ CURB STOP**  
C-4 NOT TO SCALE



**NOTES:**

1. A 3/4" OR 1" CURB STOP/BOX SHOULD BE SUBSTITUTED WHERE APPROPRIATE.
2. INSTALLATION, MATERIALS, AND LABELING OF THE CURB STOP AND CURB BOX/CAP ARE TO BE TYPICAL OF RIVERHEAD WATER DISTRICT.

5 **DETAIL: CURB STOP**  
C-4 NOT TO SCALE

**Standard Detail & Specifications**

### Tree Protection

**Location of Tree Protection**

**Methods of Tree Protection**

Source: Adapted from VA ESC Handbook	Symbol: TP	Detail No. DE-ESC-3.7.2 Sheet 1 of 3 Date: 12/03
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**Standard Detail & Specifications**

### Tree Protection

**Construction Notes:**

Any device may be used which will effectively protect the roots, trunk and tops of trees retained on the site. However, trees to be retained within 40 feet of a proposed building or excavation shall be protected by fencing. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained.

**Materials:**

1. Snow Fence - Standard 40-inch high snow fence shall be placed at the limits of clearing on standard steel posts set 6 feet apart
2. Board Fence - Board fencing consisting of 4-inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. If it is not practical to erect a fence of the drip line, construct a triangular fence nearer the trunk. The limits of clearing will still be located at the drip line, since the root zone within the drip line will still require protection.
3. Plastic Fencing - 40-inch high "international orange" plastic (polyethylene web) fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:
 

a. Tensile yield:	Average 2,000 lbs. per 4-foot width (ASTM D638)
b. Ultimate tensile yield:	Average 2,900 lbs. per 4-foot width (ASTM D638)
c. Elongation at break (%):	Greater than 1000% (ASTM D638)
d. Chemical resistance:	Inert to most chemicals and acids

Source: Adapted from VA ESC Handbook	Symbol: TP	Detail No. DE-ESC-3.7.2 Sheet 2 of 3 Date: 12/03
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**Standard Detail & Specifications**

### Tree Protection

4. Card Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of card 1/4-inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the string at intervals no greater than 3 feet.
5. Earth Berms - Temporary earth berms shall be constructed according to specifications for a Temporary Earth Dike with the base of the berm on the tree side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.
6. Additional Trees - Additional trees may be left standing as protection between the trunks of the trees to be retained and the limits of clearing. However, in order for this alternative to be used, the trunks of the trees in the buffer must be no more than 6 feet apart to prevent passage of equipment and material through the buffer. These additional trees shall be reexamined prior to the completion of construction and either be given sufficient treatment to ensure survival or be removed.
7. Trunk Armoring - As a last resort, a tree trunk can be armored with burlap wrapping and 2-inch studs wired vertically no more than 2 inches apart to a height of 5 feet encircling the trunk. If this alternative is used, the root zone within the drip line will still require protection. Nothing should ever be nailed to a tree.

**Maintenance:**

Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

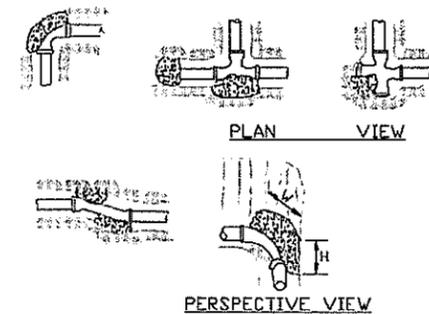
Source: Adapted from VA ESC Handbook	Symbol: TP	Detail No. DE-ESC-3.7.2 Sheet 3 of 3 Date: 12/03
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2 **DETAIL: TREE PROTECTION**  
C-4 NOT TO SCALE

**NOTES:**

1. CONCRETE THRUST BLOCKS ARE TO BE POURED AGAINST UN-DISTURBED EARTH.
2. CONCRETE THRUST BLOCKS SHALL BE OF CLASS 'C' (4 1/2 SACK MIX) CONCRETE.
3. ALL VALVES SHALL BE SUPPORTED PER DETAIL 'A' BELOW.
4. PLUG ALL STUBS PER SPECS.
5. ALL CONCRETE SHALL BE POURED TO AVOID INTERFERENCE WITH BOLTED CONNECTIONS.
6. WHERE PIPE CONNECTS TO A FITTING IN A STEEL PIPELINE, THE STEEL PIPELINE SHALL BE BLOCKED AS SHOWN HEREON.
7. CONCRETE SHALL BE CONFINED BY FORMS TO PROVIDE A MINIMUM CLEARANCE OF 4" AT FLANGE BOLTS AND NUTS.

SIZE/TYPE	SAFE SOIL BEARING # S.F.	THRUST BLOCK DIMENSIONS
2" TEE	1500	1x3
2" 90° BEND	1500	2x2
2" 45° BEND	1500	1x3
2" 22 1/2° BEND	1500	1x1



3 **DETAIL: THRUST BLOCKS (BUTTERESSES) FOR 2\"/>**

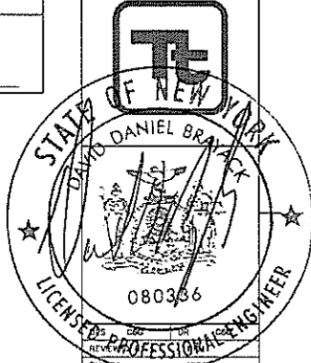
**CONSTRUCTION SPECIFICATIONS**

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA 1140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE
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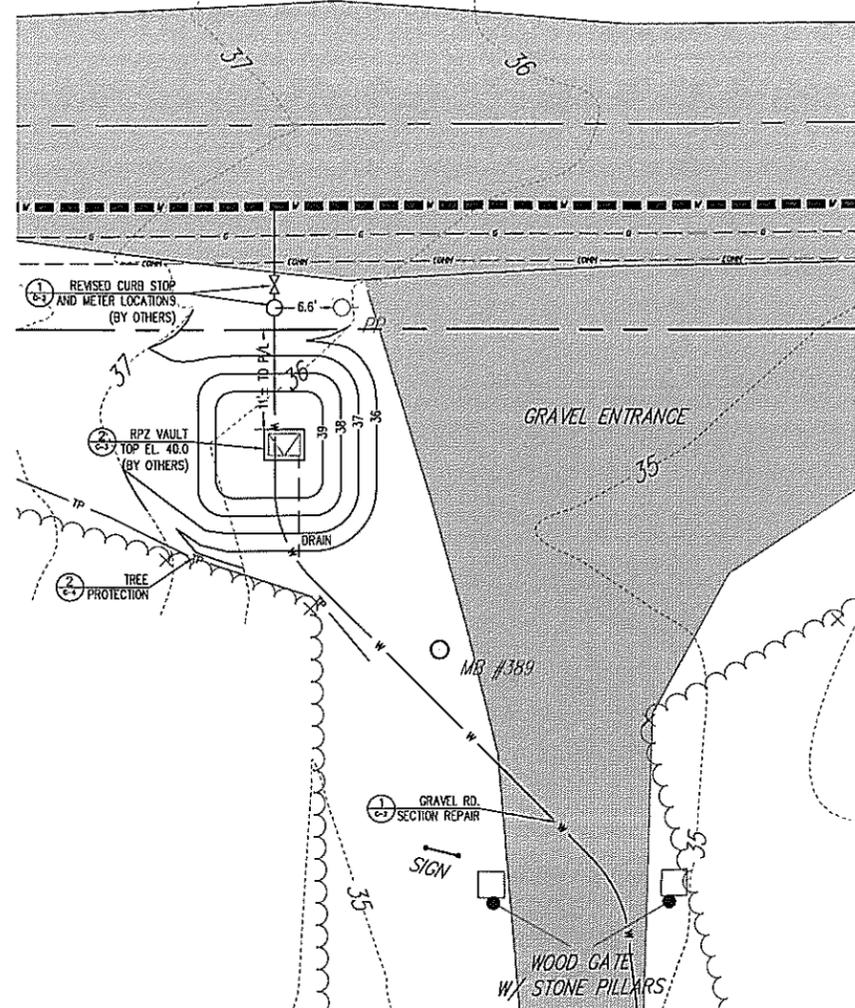
4 **DETAIL: SILT FENCE**  
C-4 NOT TO SCALE SOURCE: NYSDEC E&S DETAILS (ADOPTED FROM USDA NRCS)

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

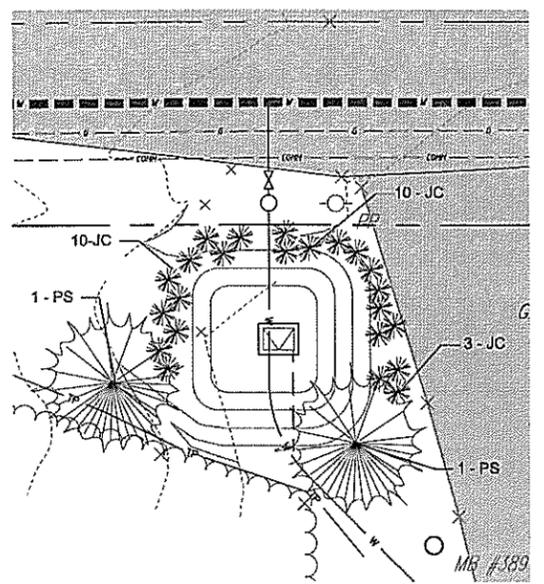


NAVAL FACILITIES ENGINEERING COMMAND  
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC  
NAVAL STATION - NORFOLK, VIRGINIA  
389 RIVER RD CALVERTON NY SUFFOLK COUNTY, NEW YORK  
NORHEAST PT  
INSTALLATION OF WATER SERVICE  
TO PECONIC RIVER SPORTSMAN'S CLUB  
SITE DETAILS

CODE NO. 00031	SIZE D
SCALE	NRS
MAGNO NO.	-
JOB ORDER NO.	-
SPEC. NO.	-
CONSTR. CONTR. NO.	112602045
NAVAFAC DRAWING NO.	-
SHEET	5 OF 6



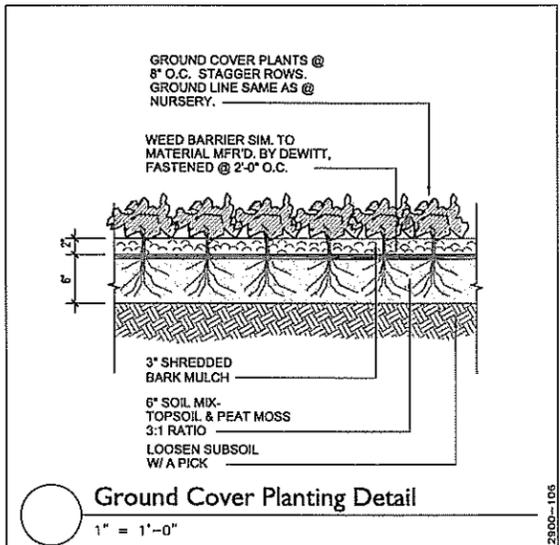
1 PLAN: GRADING AND TIE-IN PLAN FOR RPZ AREA



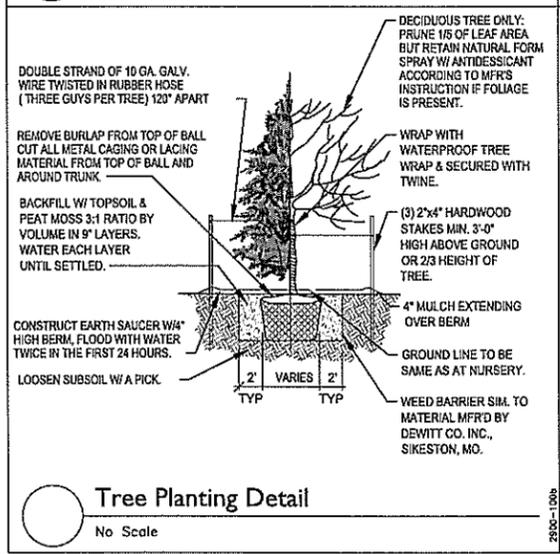
2 PLAN: PLANTING PLAN FOR RPZ AREA

PLANTING SCHEDULE - PACKAGE 'A'

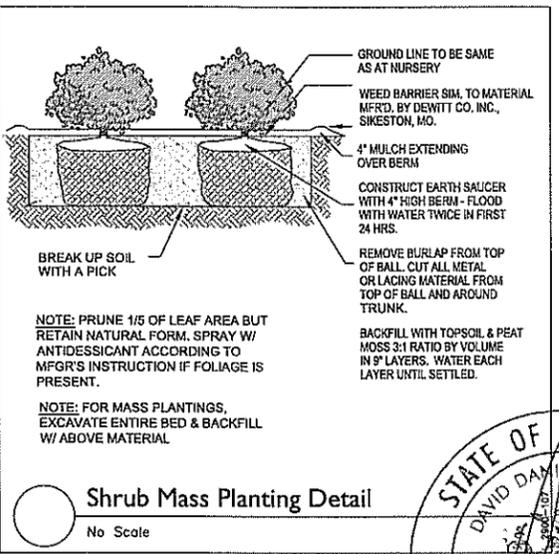
KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE AT PLANTING	ROOT	COMMENTS
PS	2	PINUS STROBUS 'FASTIGIATA'	SHEARED EASTERN WHITE PINE	8-10' FULL	B&B	UNIFORM SCREEN
JC	23	JUNIPERUS CONFERTA	SHORE JUNIPER	15-18"	CONT.	FULL



Ground Cover Planting Detail  
1" = 1'-0"



Tree Planting Detail  
No Scale



Shrub Mass Planting Detail  
No Scale

- CONTRACTOR IS RESPONSIBLE FOR COMPLETE COVERAGE OF PLANTING BEDS AND TREE RINGS AT SPACING SHOWN.
- PROPOSED PLANTING MATERIALS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER BEFORE, DURING AND AFTER INSTALLATION.
- PLANT MATERIALS TO BE COMMERCIAL GROWN AND BUD HARDY WITHIN USDA HARDINESS ZONE OF THE PROJECT.
- PLANTING AREAS MUST BE NEATLY CUT OR EDGED AT BED LINE AND COMPLETELY MULCHED WITHIN BEDLINE WITH 4" CONTINUOUS SETTLED DEPTH OF MULCH SPECIFIED.
- STAKE LOCATIONS OF INDIVIDUAL TREES, SHRUBS AND PLANT BELINES. NOTIFY ARCHITECT A MINIMUM OF ONE WEEK PRIOR TO PLANTING. STAKED LOCATIONS TO BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION, EXCAVATION OF PITS OR PREPARATION OF BEDS.
- IF LOCATION OF TREES ARE SHOWN WITH ROOT BALL WITHIN FIVE FEET OF UNDERGROUND UTILITIES, TREES ARE WITHIN TWENTY FEET OF OVERHEAD WIRES OR OTHER OBSTRUCTION IS ENCOUNTERED, INFORM ENGINEER AND DO NOT PROCEED WITH PLANTING UNTIL ENGINEER APPROVES LOCATION ADJUSTMENTS.
- LEGIBLY TAG PLANTS WITH NOMENCLATURE FROM "STANDARDIZED PLANT NAMES" LISTING BY AMERICAN JOINT COMMITTEE OF HORTICULTURE. RETAIN TAGS ON PLANT MATERIALS AND SHIPPING RECEIPTS FOR ENGINEER REVIEW. TAGS TO BE REMOVED ONLY AFTER ENGINEER'S FINAL REVIEW OF PLANT MATERIALS. PLANT MATERIALS TO BE TRUE TO NAME, FORM, SIZE AND LOCATION INDICATED ON DRAWINGS AND SPECIFIED.
- FULLY MAINTAIN PLANTING AND LAWN AREAS INCLUDING, BUT NOT LIMITED TO: STAKING, WATERING, SPRAYING, PRUNING, MULCHING AND FERTILIZING UNTIL THE PROJECT IS FINAL REVIEWED AND ACCEPTED BY ENGINEER.
- PLANT MATERIAL WHICH DIES, TURNS BROWN, DEFLIATES OR IS DEEMED UNSATISFACTORY BY ENGINEER PRIOR TO ACCEPTANCE OF THE WORK SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY AND SIZE UNLESS A SUBSTITUTION IS APPROVED BY THE ENGINEER.



Unauthorized alteration or addition to this plan is a violation of Section 7209 of the New York State Education Law, unless the person is acting under the direction of a licensed professional engineer. Any plan alterations by another engineer must be marked as such, including the signature and seal of the altering engineer.

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

NAVFAC  
TE

DES: CGS DR: CGS  
REVIEWED BY: HMM  
PI/DM: HMM  
CHECK ENG/ARCH: DS

NAVY FACILITIES ENGINEERING COMMAND  
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC  
NAVAL STATION - NORFOLK, VIRGINIA  
389 RIVER RD CALVERTON NY SUFFOLK COUNTY, NEW YORK  
INSTALLATION OF WATER SERVICE  
TO PECONIC RIVER SPORTSMAN'S CLUB

LANDSCAPE PLAN AND DETAILS

DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND  
NAVAL STATION - NORFOLK, VIRGINIA  
389 RIVER RD CALVERTON NY SUFFOLK COUNTY, NEW YORK  
INSTALLATION OF WATER SERVICE  
TO PECONIC RIVER SPORTSMAN'S CLUB

CODE ID NO. 80021 SIZE D  
SCALE: 1"=10'  
MAXIMO NO.  
JOB ORDER NO.  
SPEC. NO.  
CONSTR. CONTR. NO. 112G02045  
NAVFAC DRAWING NO.  
SHEET 6 OF 6

L-1

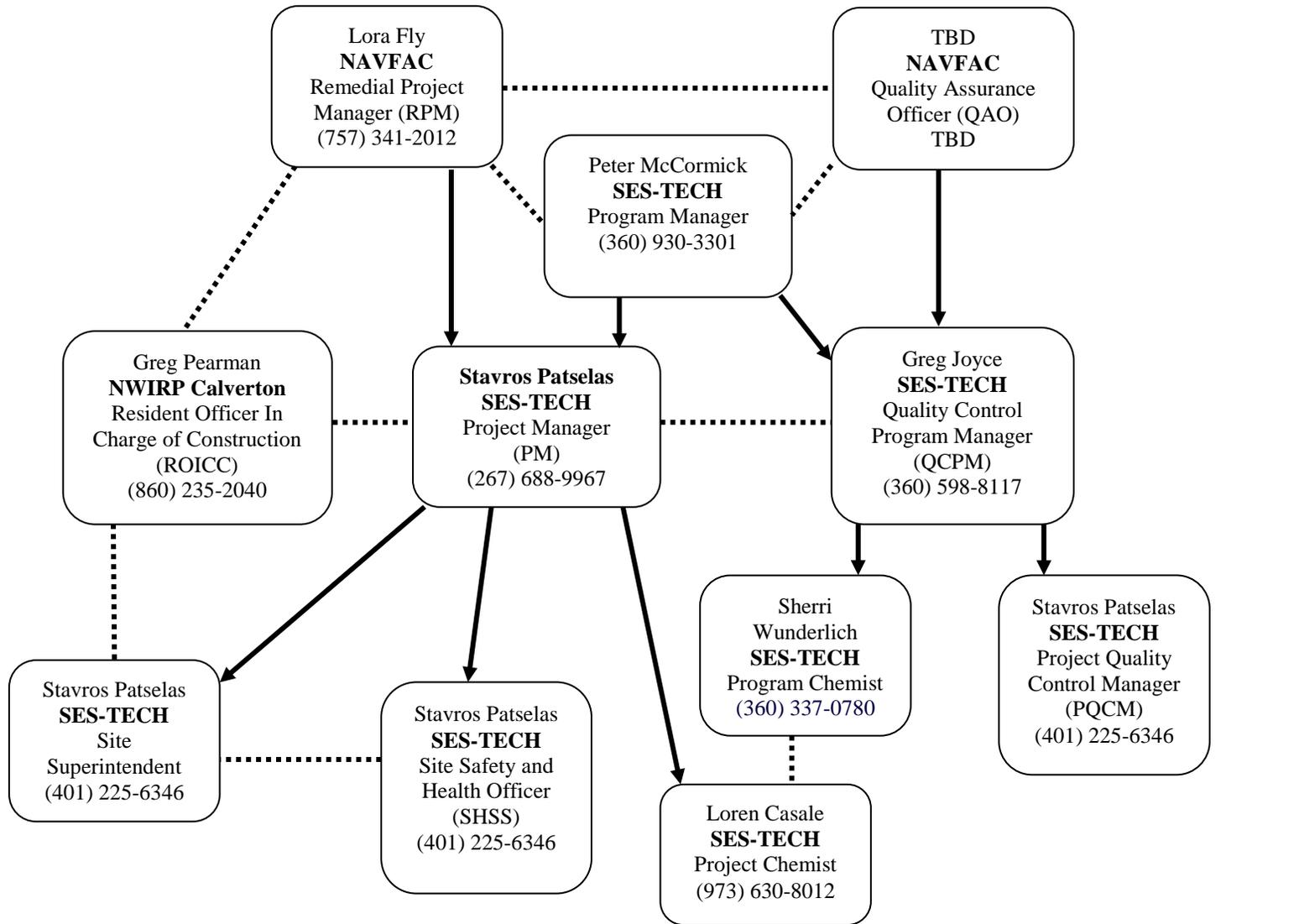
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**APPENDIX C**  
**PROJECT ORGANIZATION CHART**

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# PROJECT ORGANIZATION CHART

INSTALLATION OF WATER SERVICE TO PECONIC RIVER SPORTSMAN'S CLUB  
 NAVAL WEAPONS INDUSTRIAL RESERVE PLANT – CALVERTON, NEW YORK



Line of Authority

Line of Communication

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