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## **Revised Remedial Action Plan Oronoco Outfall Site**

Alexandria, VA  
VRP Site No. 00241

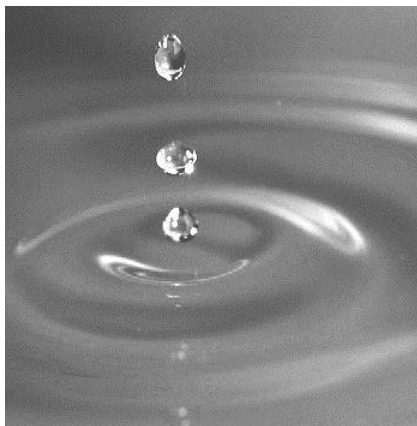
**Submitted by:**

City of Alexandria  
Department of Project Implementation  
Room 3200, 301 King Street  
Alexandria, VA 22314

**Prepared by:**

GEI Consultants, Inc.  
1620 I Street, NW, Suite 800  
Washington, DC 20006  
(202) 828-9510

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Project 1604390



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Paul Landers, P.E.  
Project Manager

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Roger Hathaway, P.E.  
Vice President

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## Abbreviations and Acronyms

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AAC	Ambient Air Concentration
ASTM	American Society for Testing and Materials
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CM	Construction Manager
CMS	Chip Measuring System
CoA	City of Alexandria
CSC	Coconut Shell Carbon
GEI	GEI Consultants, Inc.
IRM	Interim Remedial Measure
MM&A	Marshal Miller & Associates
MGP	Manufactured Gas Plant
NAPL	Non-aqueous Phase Liquid
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSS	Oil separator Stormsepor
PAHs	Polycyclic Aromatic Hydrocarbons
PAMP	Perimeter Air Monitoring Plan
PEC	Probable Effect Concentration
PID	Photoionization Detector
PM <sub>10</sub>	Particulate Matter
POTW	Publically-owned Treatment Works
RA	Remedial Action
RAO	Remedial Action Objective
RAP	Remedial Action Plan

TWA	Time-weighted-average
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
VDEQ	Virginia Department of Environmental Quality
VOC	Volatile Organic Compound
VRP	Voluntary Remediation Program

### **MEASUREMENTS**

°C	Degrees Celsius
CY	Cubic Yards
mg/L	Milligrams per Liter
NTU	Nephelometric Turbidity Unit
ppt	Parts per Thousand
µg/m <sup>3</sup>	Micrograms per Cubic Meter

# 1. Introduction

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On behalf of the City of Alexandria (CoA, City), GEI Consultants, Inc. (GEI) has prepared this Revised Remedial Action Plan (RAP) for an environmental remediation of the Oronoco former manufactured gas plant (MGP) outfall site located in Alexandria, Virginia (the “Site”). The Site is located on the Potomac River adjacent to the location of the former Oronoco MGP and the Oronoco Street outfall (Figure 1).

This Remedial Action (RA) will remove approximately 2,900 cubic yards (CY) of impacted sediments, via mechanical dredging, containing tar-like and oil-like material. The dredged material will then be barged Port Weanack in Charles City for offloading and stabilization, and then trucked to Charles City Landfill (operated by Waste Management) for final disposal. The removal of the impacted sediments and restoration of the Site will provide an enhanced benthic environment for native marine species and reduce the risk to human health.

This RA is being performed as part of the Virginia Department of Environmental Quality’s (VDEQ) Voluntary Remediation Program (VRP).

## 1.1. RAP Organization

This RAP is organized into the following sections:

- Section 1 – Introduction: This section presents the purpose and organization of the RAP, and the Site background information.
- Section 2 – Remedial Action Objectives (RAO): This section discusses risks from the sediment impacts and the selection of the RAO.
- Section 3 – RA Summary: This section includes a description of the selected remedy.
- Section 4 – Environmental Monitoring: This section presents the plans for monitoring air and water during and post construction.
- Section 5 – Reporting: This section presents the post-RA reporting plan.
- Section 6 – Schedule: This section presents the tentative RAP schedule.

## 1.2. Project Organization Structure and Responsibility

The CoA will coordinate with the VDEQ, U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), and other regulatory agencies to conduct the RA at the Site, as needed. The CoA will have final responsibility and authority for all aspects of the RA. A CoA

representative will be on site or accessible via phone throughout the RA. When the CoA representative is off site, the Construction Manager (CM) will act as the CoA's representative. The CM will not direct the contractor on the specific means and methods of construction; however, the CM will advise the contractor of non-compliance with the contract documents and identify any required corrective action.

The engineer (GEI), under contract to CoA, will serve as the engineer of record for the RA. The engineer is responsible for engineering design and will provide assistance to the CoA on an as-needed basis.

The contractor, under contract to CoA, will be responsible for all on site construction activities including, but not limited to, compliance with all applicable Occupational Safety and Health Administration (OSHA) health and safety regulations, construction personnel health and safety, implementation of odor control measures (as necessary), traffic control, site security, dredging, material handling, transportation and disposal, and any other specified tasks outlined in the RAP or contract documents.

The following are the key personnel for the RA:

City of Alexandria	Tafesse Gyes, P.E. Department of Project Implementation Room 3200 301 King Street Alexandria, Virginia 22314
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Engineer:	Paul Landers, P.E. GEI Consultants, Inc. 1620 I Street, NW Suite 800 Washington, DC 20006 (202) 609-7678
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Construction Manager	To be determined.
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Contractor:	To be determined.
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### **1.3. Site Description and History**

This section describes the physical setting of the Site, and summarizes the remediation history of the MGP.

### **1.3.1. Site Description**

The Site is located on the Potomac River in the City of Alexandria, Virginia. The remediation area is adjacent to the Oronoco Street stormwater outfall pipe and is bounded to the north by Robinson Terminal North pier, to the south by Founders Park, and to the east by the Robinson Terminal North pier line.

The City of Alexandria operated an MGP adjacent to the Site to provide gas for domestic purposes. The former MGP Site occupied an approximately one-acre parcel and was located at the southeast corner of the current intersection of North Lee Street and Oronoco Street. Currently the Site is occupied by a townhouse complex with residences to the south, east, and west and a commercial area to the north.

Sediments in the Potomac River adjacent to the Oronoco Street outfall were impacted by residuals from the MGP. The former MGP site is currently undergoing a remedial investigation and remediation that is being overseen by the VDEQ VRP.

### **1.3.2. Summary of Previous Investigations and Interim Remedial Measures**

Several investigations and Interim Remedial Measures (IRMs) have been conducted to both delineate the impacts to the sediments and limit their migration off site.

IRMs and investigations, performed to date, include:

- In 2000, a sediment investigation was conducted to determine the lateral and vertical extent of sediment impacts. Samples were tested for volatile and semi-volatile organic compounds. A preliminary risk assessment was performed using the study results to compare the Site levels of polycyclic aromatic hydrocarbons (PAHs) to human and ecological risk-based benchmarks.
- In 2009, approximately 300 ft of the storm sewer outfall pipe was lined between North Lee Street and North Union Street to prevent infiltration of tar and impacted groundwater into the pipe.
- In 2011, a follow-up sediment investigation was conducted to re-delineate the lateral and vertical extent of sediment impacts. Several locations were re-sampled to assess changes in conditions. Core samples from key areas were also tested to determine the rate of natural attenuation in the sediments.
- In 2013, the section of the storm sewer from North Union Street to the Oronoco Street outfall was lined.

- In 2013, an IRM was performed to address tar and impacted groundwater moving through the bedding of the storm sewer. The IRM included excavation of source material and the installation of a series of systems to contain free phase tar and remediate dissolved phase impacts starting near the intersection of Oronoco Street and North Union Street and consisted of the following components:
  - The area surrounding the storm sewer was excavated from the intersection of Oronoco Street and North Union Street to approximately 50 ft west of the outfall. The excavation extended below the storm sewer and all the pipe bedding and surrounding material was removed and replaced with clean bedding.
  - An oil separator Stormseptor (OSS) was installed approximately 50 ft east of the intersection of Oronoco St and North Union Street. The OSS is designed to intercept mobile tar as it moves through the storm sewer bedding. The gallery is monitored routinely and any tar that collects in the sump is removed and disposed of.
  - A 9-point biosparging system was installed along the storm sewer in Oronoco Street east of the OSS. Air is injected into the groundwater as it passes through the injection zone to facilitate microbial degradation of dissolved phase contaminants.
  - A permeable reactive barrier was installed approximated 50 ft west of Oronoco Street outfall. The reactive barrier was installed to capture any potential residuals not contained or treated by the upgradient systems.
  - Quarterly biosparge reports are prepared and submitted by Cardno, Inc. (formerly MM&A) documenting the performance of the biosparge system.
- In 2016, a survey of the storm sewer identified liquid tar within the storm sewer upstream of the outfall. In early 2017, the sewer between Lee Street and Union Street was cleaned. The section at Lee Street was also lined using shotcrete. The lateral connections in this stretch of the sewer were also grouted as well as the annular space between the existing CIPP liner and the host pipe. The CoA is currently conducting routine storm water sampling to confirm the absence of BTEX and PAHs in the discharge from the outfall.

#### **1.4. Summary of the Pre-Design Investigations**

Pre-design investigations were conducted by GEI on April 20 and 21, 2016 and April 4 and 5, 2017 to evaluate the sediments for visual evidence of impacts, collect analytical data to address data gaps identified within the proposed dredge and reactive cap areas, and collect waste characterization data that could be used to dispose of the sediments. In addition,

Cardno conducted sediment sampling activities on January 26, 2017. Analytical results from the Pre-Design Investigations are provided in Appendix A.

#### ***1.4.1. 2016 Pre-Design Investigation Activities***

A total of 12 sediment cores were advanced within the remediation area to a depth of 1, 2, or 3 ft below the sediment line to collect soil samples for laboratory analysis to further define the extent of impacts at each of these sediment depths (Figure 2). The core locations were advanced below the sediment interface using a hand push core barrel (either WILDCO Hand Corer Sediment Sampler or AMS Multi-Stage Sediment/Sludge Sampler) to the identified depth. The recovered cores were visually inspected for physical properties including color, composition, moisture content, etc., and visual or olfactory evidence of impacts, if present, were noted. In addition, soil cores were field screened with a photoionization detector (PID) for organic compounds. Sample locations and analytical results are shown on Fig. 3 (results from 1 ft below the sediment surface), Fig. 4 (results from 2 ft below the sediment surface), and Fig. 5 (results from 3 ft below the sediment surface). All data in the figures have been normalized to 1.9% TOC as described in the guidelines (WDNR, 2003).

Excess sediments recovered from the 2016 sediment investigation were composited and submitted for laboratory analysis of waste characterization parameters. These results will be used to facilitate waste profiling with potential landfills for disposal.

#### ***1.4.2. 2017 Pre-Design Investigation Activities***

In January 2017, Cardno advanced 3 sediment cores along the shoreline south of the remediation area to confirm and delineate an exceedance from the April 2016 investigation (SS-16). The core locations were advanced via hand-pushing clear plastic polybutyrate tube to the target depth. Recovered sediments were logged and field screened using a flame-ionization detector (FID). The results of the January 2017 sampling event are summarized in Figures 3, 4 and 5 and presented in Appendix A.

In April 2017, GEI conducted an additional investigation which included advancement of 25 sediment cores to further refine the proposed dredging extents. The sediment cores were advanced using a vibracore from a flat-bottom skiff equipped with an A-frame and winch. Recovered sediments were logged and field screened per the methodology described in Section 1.4.1. Initially, sediment cores advanced on the eastern periphery of the dredge limits were placed on hold pending the results of the adjacent sediment locations. A total of 19 of the 25 sediment locations were analyzed for PAHs and their results are summarized in Figure 3, 4 and 5 and are also presented in Appendix A.

## 1.5. Future Plans for Robinson Terminal North Pier

The City's immediate priority is the remediation of the Potomac River bed adjacent to the Oronoco Street storm drain outfall as indicated on the current Technical Specifications document prepared by GEI, and contained in Appendix B. This project will remove and cap contaminated sediments proximate to the Oronoco outfall and restore public access to portions of Oronoco Bay by allowing the removal of the long-standing boom. The City will move forward with this portion of the project immediately after receiving approval from the Virginia DEQ on the City's revised Remedial Action Plan. While addressing any contaminated sediments beneath the privately-owned Robinson Terminal North (RTN) pier is also a priority for the City, this area poses significant ownership, safety and scheduling issues which will take additional time to resolve.

First, the site has been characterized by experts as being unsafe for full characterization and remediation (if necessary). The current owner of the Robinson Terminal North Pier, City Interests, has been working with the City of Alexandria for the past several years on potential redevelopment of their site, including the pier area. As part of its preparation to develop the RTN site, City Interests commissioned an engineering assessment of its pier, which was conducted by Moffat & Nichol in 2013 (see Appendix C). The assessment concluded that "the timber pile-supported portion of the pier is in POOR to SERIOUS condition. Several of the piles were found to be split or hollowed with rot. Most of the timber piles were out of plumb, many to the point where they had limited contact with the bent caps." The assessment report went on to state that "the timber pile-supported areas of the pier are not recommended for future use." Since 2013, the timber portion of the pier has further deteriorated as shown in the photographs on page 8 of this document. Furthermore, GEI and Cardno have stated that it is not safe for them to perform sediment sampling under the pier in its current condition. Additionally, the accumulation of large tree trunks and other debris under the pier makes it impossible to perform comprehensive sediment sampling at this time, which would be necessary to define the extent of impacts in this area. Therefore, the site is not accessible for work at this time; however, redevelopment of the property that includes the pier remains under consideration. The City expects that redevelopment will result in either the removal of the pier or the stabilization of it for future use. Either approach will facilitate characterization of the sediment below the pier and any necessary remediation.

Second, the City is currently planning for a significant project that may take place in this same area to address legislation passed in the 2017 session of the Virginia General Assembly. House Bill 2383 and Senate Bill 898 require Alexandria to remediate its four combined sewer outfalls (CSO) by July 1, 2025. Because of the very short deadline, the City will have to implement a gray infrastructure solution (rather than using green infrastructure to achieve some or all of the overflow reduction that will be necessary). That likely means that the City will be required to install one or more massive storage tanks and/or a tunnel in

the vicinity of the pier. One option that has been under preliminary consideration involves construction of a large detention tank in Oronoco Bay, in the vicinity of the Robinson Terminal North pier. This potential project could impact the pier itself and sediment underneath and around the pier. The legislation includes a statutory deadline of July 1, 2018 for the Virginia DEQ to identify the activities that will be required to address CSO 001 and CSO 002, so this decision will be made by that date. The City expects that there will be a public participation opportunity as part of DEQ's decision making process to identify the State-mandated CSO controls and that public input on DEQ's approach will help keep DEQ and the City on target to address CSO control in that area.

While the safety, redevelopment, and regulatory issues affecting the pier are being resolved, the City will install a sediment barrier south of the pier to prevent migration of potentially contaminated sediment from beneath the pier into the newly remediated area of Oronoco Bay. Specifically, after the dredging is done and the cap is in place, a Type III silt barrier turbidity curtain will be installed between the dredge/cap area and the pier to prevent recontamination by migration of potentially impacted sediments from under the pier. An absorbent boom will be attached along the length of the Type III silt curtains to absorb any contaminants that might float by. The City will institute a program of inspection and maintenance for the barrier. We note that absorbent boom Type III silt barriers are the strongest available floating barriers for silt and turbidity control. Information on these silt barriers can be found at the following link: [http://www.silt-barriers.com/type\\_3\\_silt\\_barrier.html](http://www.silt-barriers.com/type_3_silt_barrier.html)

In conclusion, the Robinson Terminal North Pier is currently not safe to access. The City is discussing redevelopment plans with the owner of the pier. Those plans will include either stabilizing or removing the pier. At the same time, Virginia DEQ will be evaluating CSO control alternatives – which include potential storage structures at or near the existing pier location. The City will have further clarity on these two conditions precedent in the coming months.

Therefore, the City will commit to the following:

- If no court action is necessary to require the pier owner to stabilize the pier and no permits are necessary in order to stabilize the pier and safely conduct the sampling, the City will conduct a sampling of the area under the pier within twelve (12) months from the date this Remedial Action Plan is approved by VDEQ, or
- If court action is required or if the property owner is required to apply for permits in order to stabilize the pier, the City will file such court proceeding or otherwise cause the property owner to apply for the permits within twelve (12) months from the date this Remedial Action Plan is approved by VDEQ and will conduct the sampling within three (3) months of completion of stabilization of the pier, and

- If the sampling indicates that there are contaminated sediments under the pier that are a result of the Oronoco Outfall, the City will amend this Remedial Action Plan (RAP) to address appropriate remediation based on the sampling results. The amended RAP will be submitted to VDEQ for approval within nine (9) months from receipt from the City's consultants of a final sampling results report unless a longer time is agreed to by the City and DEQ in consultation with stakeholders such as the Potomac River Keeper Network. The amendment will include a remediation goal of the same level as that described in this RAP for the area to the South of the outfall. The method used for remediation will be determined based on the results of the sampling, the City's experience with the dredging around the outfall, and in consultation with stakeholders such as the Potomac River Keeper Network.



**Photo 1 of Current conditions of Robinson Terminal North Pier**



**Photo 2 of Current conditions of Robinson Terminal North Pier**

## 2. Remedial Action Objectives

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This section discusses the risks associated with impacts present on-Site, evaluates the need for further investigation, and presents the RAOs proposed for this RAP.

### 2.1 Sediment Conceptual Site Model

Based on the results of the pre-design investigation, we have revised the conceptual site model developed by Marshal Miller & Associates (MM&A) in their 2013 RAP. The data suggest that mobile tar is found predominantly in the sediments immediately off the Oronoco Street outfall and in the channel leading to the east from the outfall. Impacts to sediments outside the channel are concentrated in the top 1 to 2 ft of the river bed. Figure 6 presents the revised conceptual model showing the areas of source material, heavy sediment impacts, and the larger area of surficial sediment chemical impacts. Each of these areas are discussed below.

#### 2.1.1 *Upland Source Material*

Historically, the upland source of the tar/impacted groundwater migrated within the sewer and along the relatively coarse bedding of the storm sewer, traveling east along Oronoco Street and into the Potomac River. Variations in groundwater levels as a result of tidal fluctuation and precipitation acted as a driving force to move tar and impacted groundwater toward the outfall and into the sediments. Until recently, there was also the potential for tar and impacted groundwater to seep through the joints of the storm sewer pipe or storm sewer laterals in the vicinity of the Site and flow into the river with stormwater runoff. The CoA has completed several IRMs to address this upland source, as discussed in Section 1.3.2.

As a result of the completed IRMs, the only remaining area with potentially mobile tar capable of reaching the Potomac River is the approximately 50 ft of pipe bedding between the permeable reactive barrier and the outfall. The quantity of this potential source material is expected to be very small with limited migration potential.

#### 2.1.2 *Sediment Impacts*

Immediately off shore from the Oronoco Street outfall there is a concrete apron extending approximately 2 to 3 ft from the base of the outfall pipe, which was presumably installed to diminish the erosive force of the storm sewer discharge. Beyond the apron is a channel, which has been formed by scouring from stormwater discharge. The channel is approximately 15 ft wide and extends approximately 45 ft to the east toward the navigable section of the river.

Results of probing in the outfall channel indicate that approximately 12 ft of the channel appear to have been hardened with concrete at a depth of approximately 3 ft below the surrounding sediment surface. The construction type, purpose, and lateral extent of this concrete surface are unknown.

Debris (tree branches, leaf matter, plastic, etc.), some soft sediment, and tar have accumulated in the outfall channel. Some of this tar has migrated into the surrounding sediments. Cores collected during the pre-design investigation in this area indicate tar and soft sediments to a depth of as much as 3 ft below the sediment surface near the outfall, tapering to a depth of 2 ft below the sediment surface 50 ft away from the outfall. Cores in the immediate area surrounding the channel exhibit free tar in sand lenses within the upper 1 ft of sediment. It should be noted, that SS-2, located approximately 50 ft east of the outfall, was advanced to 4 ft below the sediment line to determine whether visual impacts were observed in deeper sediments due to re-deposition. Though sediment recovery was limited at this location, visual indications of impacts were not observed deeper than 1 ft below the sediment line. Disturbance of sediment within the vicinity of the channel generated a heavy sheen. The disturbance of sediments beyond the area near the channel generated some sheen, with the amount of sheen decreasing with distance from the outfall. Observations of MGP impacts including free tar, sheen, and staining are generally limited to within the confines of the outer boom, with exception to SS-4, SS-6, and SS-8 where slight sheen was generated during initial core advancement.

The historic and recent analytical data collected during the April 2016 investigation indicate that the sediments exhibit lower levels of PAH impacts decreasing with depth and distance from the outfall. Chemical exceedances greater than the Probable Effect Concentration (PEC) are generally limited to within the upper 2 ft of the sediment and decrease with depth. The lone exceptions are an area of soft sediment at SS-8, where tPAH concentrations increased with depth and the highest concentration was measured at 3 ft below the sediment line, and the sample at SS-23 south along the shoreline where tPAH concentrations were measured above the PEC at 3 ft below the sediment line.

### **2.1.3 Impact Halo**

Based on a review of the available historic data for the upland portion of the Oronoco Street outfall and sediments, the most extensive impacts are limited to the outfall channel and a small surrounding buffer area, and are potentially a continuing source. Outside of this area, impacts greater than the PEC decrease to the south and east, in essence creating a halo area that is generally limited to the upper 2 ft of sediments. A larger halo then extends beyond this area with surficial sediments that have been impacted, but are below the PEC. These observations suggest that concentrated contaminants near the outfall and in the outfall channel adsorbed to sediments that were then carried out into the broader halo areas by storm water flow and tidal movements.

## 2.2 Receptors

Potential human receptors include recreational boat traffic and fisherman. Ecological receptors include benthic organisms and fish, and birds and marine mammals.

## 2.3 RAOs

The objective of the RA is to remove MGP-impacts present in the sediments, where present and accessible. Cleanup standards were developed in the 2013 RAP (*Revised Remedial Action Plan – Off Site Sediments, Oronoco Site, Alexandria, VA, Marshall Miller & Associates, February 1, 2013*). MM&A calculated a PEC of 22.8 mg/kg tPAH using the DEQ risk screening process, which will be the cleanup standard used during this remediation. For the purposes of defining the sediments which exceed the PEC, all data has been normalized to 1.9% TOC as described in the guidelines (WDNR, 2003).

## 2.4 Performance Standards

Based on the objectives developed for the RA, the following performance standards will be used to assess the success of the RA:

- No visible tar-related sheen coming from the outfall or area where the work was conducted.
- Monitoring the sand cover and reactive cap area. Sampling the top 6 inches of cover material for 18 PAHs as identified in the Wisconsin Department of Natural Resources (WDNR) Consensus-Based Sediment Quality Guidelines (WDNR, 2003) at 1 and 2 years following the installation of the cover to confirm that the remediated area continues to exhibit total PAH levels less than the performance criteria of 22.8 mg/kg total PAHs (normalized to 1.9% TOC).

## **3. Remedy**

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### **3.1 Remedy Selection**

The following remedial approach is proposed for the Site:

- Perform dredging to approximately 3 ft below the existing sediment surface near the outfall and channel area to remove the maximum practicable amount of separate phase non-aqueous phase liquid (NAPL). The depth of removal near the outfall will be limited by the presence of a stacked stone block and concrete seawall with an unknown depth to the bottom of its foundation.
- Dredge the sediments outside the outfall area to a depth of 1 to 2 ft, as needed, to remove impacts above the PEC.
- Place an armored reactive mat in the area around the outfall to contain future seeps from the source area.
- Place a cap of clean sand over the balance of the dredged areas.

The maximum dredge depth was selected based on physical observations and/or PAH levels exceeding the proposed cleanup standard. The detailed design drawings and specifications included in Appendix B will be provided to the prequalified contractors to solicit bids to perform the remediation. The means and methods for performing the RAP activities will be chosen by the contractor selected to perform the work, and then approved by the CoA. The following section summarizes the elements of the RA that will be implemented under the RAP.

### **3.2 Water Quality Impact Mitigation**

One of the primary objectives of this remedial design is to minimize the impact to the water column and atmosphere during the dredging activity. Engineering controls have been designed into the RA to mitigate the impact of the dredging on the quality of the water column. Specific controls that will be used during the work include:

- Oil absorbent booms.
- Outer turbidity curtain that encompasses the Site.
- Odor control foam being on-Site and readily available while dredging work is ongoing.
- Marine controls (lights, buoys, etc.) will be placed as per USCG regulations to alert vessel traffic to the RA.

### **3.3 Conceptual RA Approach**

The following sections contain a conceptual approach for how the dredging and capping work will be performed as part of this RA. The final means and methods of the work will be selected by the contractor and subject to review and approval of the CoA.

#### **3.3.1 *Equipment Mobilization***

The contractor will mobilize equipment to the Site required to complete the selected remedy. This includes dredging equipment, barges, and tug boats needed for sediment removal and off-site disposal. Additional equipment that will be used during the implementation of the RAP includes turbidity curtains, booms, and other equipment required to conduct the work outlined in the following sections.

#### **3.3.2 *Work Zone Controls***

Prior to the start of dredging, the contractor will install turbidity curtains and absorbent boom to help contain sediments and/or source materials disturbed during the work.

The use of sediment curtains in shallow, low water velocity environments similar to the Site has generally been found to be effective at isolating the dredging operation from the ambient water.

A more detailed discussion of the environmental monitoring program is contained in Section 4.

#### **3.3.3 *Preconstruction Survey***

The contractor will conduct a pre-construction survey of the Site. This includes creating a pre-dredge bathymetry of the Site (for payment purposes), and recording the condition of the nearby site features (sea wall, aids to navigation, etc.). This pre-construction survey will be used as the basis of comparison for any claims of damage made by abutters or residents during the RA.

#### **3.3.4 *Dredging***

Dredging and source removal will be performed in the area immediately off of the outfall and along the bottom and sides of the outfall channel to generally 3 ft of depth with some allowance for over-dredging. At a minimum, all of the material above the hard bottom of the channel and the heavily impacted material along the sides of the channel will be removed. Dredging will be terminated at the surface of the concrete apron and the reactive mat will be installed above the apron.

The larger halo area of sediment impacts will be dredged to a depth of 1 or 2 ft depending on the observed depth of impact. Areas where impacts are limited to the top 1 ft will be dredged to a depth of 1 ft, areas with deeper impacts will be dredged to a depth of 2 ft. Deeper dredge areas to 2 and 3 ft will be conducted in the areas of SS-23 and SS-8, respectively, to address the observed deeper impacts identified during the 2016 and 2017 investigations. The dredge area limits are shown on Figure 7.

The sediment removal will be conducted using an excavator from the end of Oronoco Street or from a barge mounted excavator or dredge. An enclosed environmental dredging bucket will be used unless the presence of debris or other conditions make its use unfeasible. The dredging will be conducted within the fixed turbidity curtain located at the Site perimeter.

### **3.3.5 Cap Placement**

After the target dredging depths have been achieved and verified by bathymetric survey, the contractor will complete verification sampling as discussed in Section 4.6. Once the concentrations at depth are confirmed as being acceptable, the contractor will begin construction of the cap. A reactive barrier will be constructed over the area where deeper impacted material cannot be removed because of the presence of the bulkhead, and to prevent any additional seeps stemming from the upland source. The reactive cap will be constructed in a layered process as follows (in order of deepest to shallowest) sand layer, reactive mat, sand layer, armor layer. The reactive mat will consist of organoclay reactive materials encapsulated in a non-woven core matrix bound between two geotextiles. The reactive mat will be delivered to the Site in rolls and will be placed via a crane stationed near the bulkhead or on a barge. The final layer of armor will consist of a stone fill that will protect the reactive mat from disturbances stemming from tidal forces and/or recreational use of the river. The reactive mat will be constructed such that the area where it is placed is restored to its original pre-construction bathymetry.

Areas outside of the reactive mat area will be capped with sand to raise the sediment grade back to its original bathymetry. The clean sand cap will serve as a barrier for deeper residual impacts less than the PEC that are left in place. The reactive cap and sand cap areas are presented in Figure 8. Prior to any aquatic fill materials being imported to the Site, the contractor will be required to provide chemical and geotechnical analyses to demonstrate that the fill is in compliance with the project requirements.

### **3.3.6 Transport, Treatment, and Disposal**

Dredged material will be transported, via barge, a distance of approximately 210 miles to Port Weanack at Shirley Plantation in Charles City, Virginia. The sediments will be offloaded and stabilized using Portland cement mixing, or similar methodology, until the material passes a paint filter test.

The stabilized sediments will then be transported to the Old Dominion Landfill located at 2001 Charles City Road, Henrico, Virginia 23231.

The exact logistics for transporting and disposing the dredged materials will be confirmed by the contractor shortly following the City's issuance of the purchase order for this project. The City will share with VDEQ this information as soon as it is available.

The trucks will be equipped with mesh covers and impermeable bed liners to prevent the leakage of stabilized sediments during transit. Alternatively, the contractor may opt to omit the impermeable liners if using a dedicated fleet of trucks with watertight beds, and verification of decontamination is provided for each truck that will be used during the RA.

The exterior of trucks will be decontaminated before being allowed to exit onto a public road. At the decontamination station, each truck will be visually inspected, and brooms and/or brushes will be used to remove any stabilized material from the chassis or wheels. If necessary, the vehicles will be pressure washed before departing for the landfill.

### ***3.3.7 Porewater and Decontamination Wastewater Management***

To the extent practicable, water may be decanted from the dredging bucket into the river within the confines of the turbidity curtains, prior to the sediments being placed onto the barge. All water placed onto the barge with the sediments must be either pumped ashore for treatment or transported for disposal. Decanting free liquids from the barge into the river is not permitted. Free liquids will be pumped from the barge to an on-site wastewater treatment system, which will pre-treat the wastewater before discharging it to the publicly owned treatment works (POTW) under a permit with Alexandria Renew Enterprises (POTW owner).

### ***3.3.8 Post-Construction Inspection***

The contractor will complete a post construction survey of the Site. This survey will be performed in the presence of the CM and compare the final condition of the Site, to the baseline conditions recorded during the pre-construction survey. Any damage caused either directly or indirectly to the surrounding site features by the contractor will be repaired at their expense.

## **3.4 Dredging Material Management Plan**

The following sections describe the practices and engineering controls that will be put into place to manage the dredged sediments from their removal at the Site to their offloading at Port Weanack, in a way that minimizes the opportunity for impacted sediments to re-enter surface waters or wetlands.

### **3.4.1 Sediment Removal from the Site**

The impacted sediments will be removed from the subaqueous bottom by using an enclosed dredging bucket. The enclosed dredging bucket will help minimize the amount of loss as the sediments are brought up through the water column for transfer to the barge. The dredging operator will then place sediments into the barge and not allow them to free fall for a distance of greater than 5 ft. This is to minimize the amount of splashing that could cause already dredged sediments to re-enter surface waters. The CM will be given the authority to stop work and require adjustments to the means and methods of construction if poor practices by the dredging operator are causing sediments to re-enter the water.

The contractor will attempt to minimize the amount of water captured in the enclosed dredging bucket and transferred onto the barge. All materials that are placed into the barge (sediment, water, and possibly debris) will be transferred for treatment and offloading. The decanting of water from the barge will not be allowed at any point prior to the arrival of the barge at the offloading pier.

### **3.4.2 Sediment Stabilization and Offloading**

Upon arrival at the offload point, an oil absorbent boom will be placed around the barge while it is moored at the offload pier. The sediments will then be stabilized in the barge using Portland cement or a CoA approved equivalent additive. After the material has been stabilized, a paint filter test will be performed on a sample from the barge. If the sample fails the paint filter test then additional stabilization additive will be mixed into the material and the paint filter test will be performed on a new sample. Once the stabilized sediments have passed the paint filter test, they will be offloaded directly from the barge and onto trucks for transfer to the landfill for disposal.

## **4. Environmental Monitoring**

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The following sections describe the environmental monitoring program that will be put in place during the performance of the work.

### **4.1 Work Zone Air Monitoring**

Work zone air monitoring will be performed by the contractor during the RA, as required by OSHA. The monitoring of the work zone will be conducted in accordance with all applicable health and safety regulations for the protection of workers.

During dredging and material handling, the air in the work zone will be monitored periodically for the presence of total Volatile Organic Compounds (VOCs), oxygen, hydrogen cyanide, and hydrogen sulfide using a portable 5-gas meter. Additionally, a DustTrak™ (or equivalent) unit will be used to monitor levels of respirable dust. Measurements will be monitored from the breathing zone (4 to 5 ft above the ground) at worker locations to evaluate working conditions, and to determine whether there is a need to implement engineering controls, or change the level of worker protection.

### **4.2 Perimeter Air Monitoring**

The dredging area and amount of impacts being removed from the Site is relatively small (~2,900 cubic yards). Because of this the City will only be performing perimeter air monitoring on an as-needed basis, and will rely mainly on the data collected during the work zone air monitoring program. Given the small site and the limited amount of submerged sediment being removed, it is anticipated that the levels of VOCs and dust will be very low and that any emissions can be adequately evaluated from the results of the work zone air monitoring program.

### **4.3 Real-Time Odor Monitoring**

Although odors associated with MGP remediation do not typically present an exposure risk, odor will be noted during the remediation activities and emission control measures will be implemented to abate odors if they reach nuisance levels. The CoA on-site representative will monitor odors at the perimeter of the work area during the RA and direct the contractor to apply emission control measures, as needed.

### **4.4 Turbidity and Sheen Monitoring**

A representative from the City will be on-site at all times while work is being performed and make periodic visual observations of the turbidity curtain and absorbent boom system to

determine if they are functioning as intended. Any turbidity and/or sheen that is observed moving off-Site that is determined to be a direct result of the remediation will be brought to the attention of the contractor who will then be instructed to make any needed repairs to the turbidity curtain and absorbent boom system prior to resuming the dredging or capping work.

A small craft with absorbent boom staged onboard will be available to recover any sheen generated on-Site that escapes the limits of the environmental controls placed around the work area.

The City will coordinate with the USACE to provide all water quality data that may be required under the applicable permits.

## **4.5 Monitoring During Dredging**

After the contractor has performed the dredging work to the lines and grades shown on the design drawings (Appendix B), a set of verification samples will be collected from the shallow sediments remaining below the dredge limits. The verification samples will be collected at a rate of 1 sample per every 100 square yards of dredged area. Figure 9 shows the sample grid to be used for verification sampling. Samples will not be collected from the portion of the Site that is to be restored with a reactive mat as the barrier will prevent the upward migration of MGP-impacts left at depth.

The samples will be composited over a depth of 2 feet below the post-dredge sediment surface and analyzed by a Virginia-certified laboratory for 18 PAHs, as identified in the Wisconsin Department of Natural Resources (WDNR) Consensus-Based Sediment Quality Guidelines (WDNR, 2003), and Total Organic Carbon (TOC). If the sum of 18 PAHs normalized to 1.9% TOC is less than 45 parts per million (ppm), the contractor will be allowed to begin to place fill to restore the Site to its pre-construction bathymetry. If the sum of 18 PAHs normalized to 1.9% TOC is higher than 45 ppm, then the contractor will either be directed to remove an additional foot of material, or extend the extents of the reactive mat barrier, depending on the location of the exceedance.

## **4.6 Post Dredge Monitoring**

After completion of the RA, the City will implement a program to monitor the long term viability of the remedy. The post dredge monitoring program will consist of the following elements:

- Monitoring the sand cover and reactive cap area. Sampling the top 6 inches of cover material for 18 PAHs as identified in the Wisconsin Department of Natural Resources (WDNR) Consensus-Based Sediment Quality Guidelines (WDNR, 2003) at 1 and 2 years following the installation of the cover to confirm that the remediated area continues to exhibit total PAH levels less than the performance

criteria of 22.8 mg/kg total PAHs. Sampling will be conducted from the same grid cells shown in Figure 9.

#### **4.7 Long Term Maintenance and Monitoring Plan**

After conclusion of the RAP, the City will begin the development of a long-term maintenance and monitoring plan for the Site. The plan will detail the periodic inspections that will be performed by the City to verify that the remedy is still functioning as designed.

The sediments offshore of the City of Alexandria are owned and managed by the National Park Service (NPS). Part of the long-term maintenance and monitoring plan will detail the need for the City to enter into an access agreement with the NPS so that the long-term maintenance and monitoring of the Site can be performed.

The long-term maintenance and monitoring plan will be submitting to the VDEQ for review and approval prior to implementation.

## 5. Reporting

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A construction completion report will be prepared after completion of the RA. The report will discuss the activities conducted, document the limits of the RA, and provide documentation for activities conducted in the way of including inspection forms, air monitoring logs, disposal documentation, and other relevant information.

Specific components of the construction completion report will include:

- The actual volumes of dredged material.
- Other plans and figures (if required), photographs, cross sections, data summary tables, and appendices that will provide the CoA with an accurate accounting of the remedial measures implemented at the Site.
- Approved permits.
- Summary of construction work, meetings, and changes in the work scope.
- Results of verification sampling and any additional material removal required as a result of the sampling.
- Shipping manifests and bills of lading (contaminated soil, clean fill, and construction dewatering liquids).
- Summary of air monitoring data collected during the RA.
- “As-Built” drawings documenting the remedial activities that have been stamped by a surveyor licensed to practice in the State of Virginia.

## 6. Schedule

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The preliminary schedule for implementation of the RA is presented in the table below. Actual time frames will vary based on requirements of permits and the availability of the selected contractor.

Task/Milestone	Estimated Task/Milestone Duration (weeks)
Final Submission of RAP to VDEQ	August 2017.
Project Award	November 2016
Commencement of RA	August 2017.
Field Work	Will continue for approximately 90 days after mobilization.
Submission of construction completion report	12 weeks after completion of RA.
Monitoring of cover and surrounding area	Following installation, then at 1 year and 2 years following completion.

## 7. References

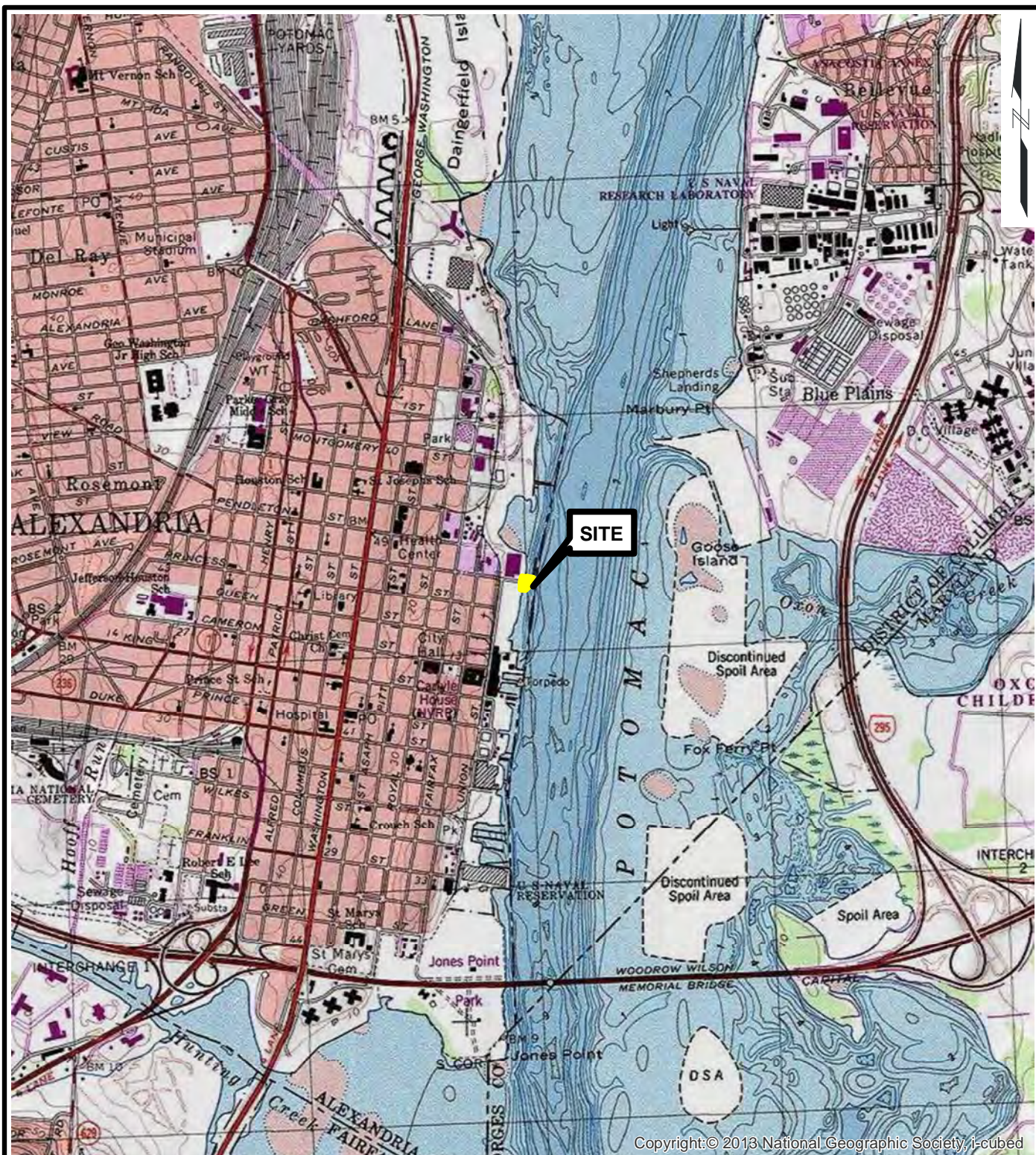
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Marshal Miller & Associates 2013. Revised Remedial Action plan – Off Site Sediment.  
Prepared for the City of Alexandria. February 1, 2013.

WDNR 2003. Wisconsin Department of Natural Resources Consensus-Based Sediment  
Quality Guidelines, Interim Guidance, December 2003, WT-732 2003.  
[http://dnr.wi.gov/topic/brownfields/documents/cbsqg\\_interim\\_final.pdf](http://dnr.wi.gov/topic/brownfields/documents/cbsqg_interim_final.pdf)

## Figures

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**SOURCE:**

1. USGS TOPOGRAPHIC MAP ACCESSED VIA ARCGIS ONLINE SERVICES.

0 2,000 4,000  
SCALE: 1" = 2000'

Alexandria Town Gas  
Oronoco Dredging & Capping  
Alexandria, Virginia

City of Alexandria  
Alexandria, Virginia



Project 1604390

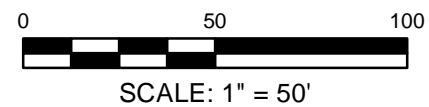
SITE LOCATION MAP


May 2017

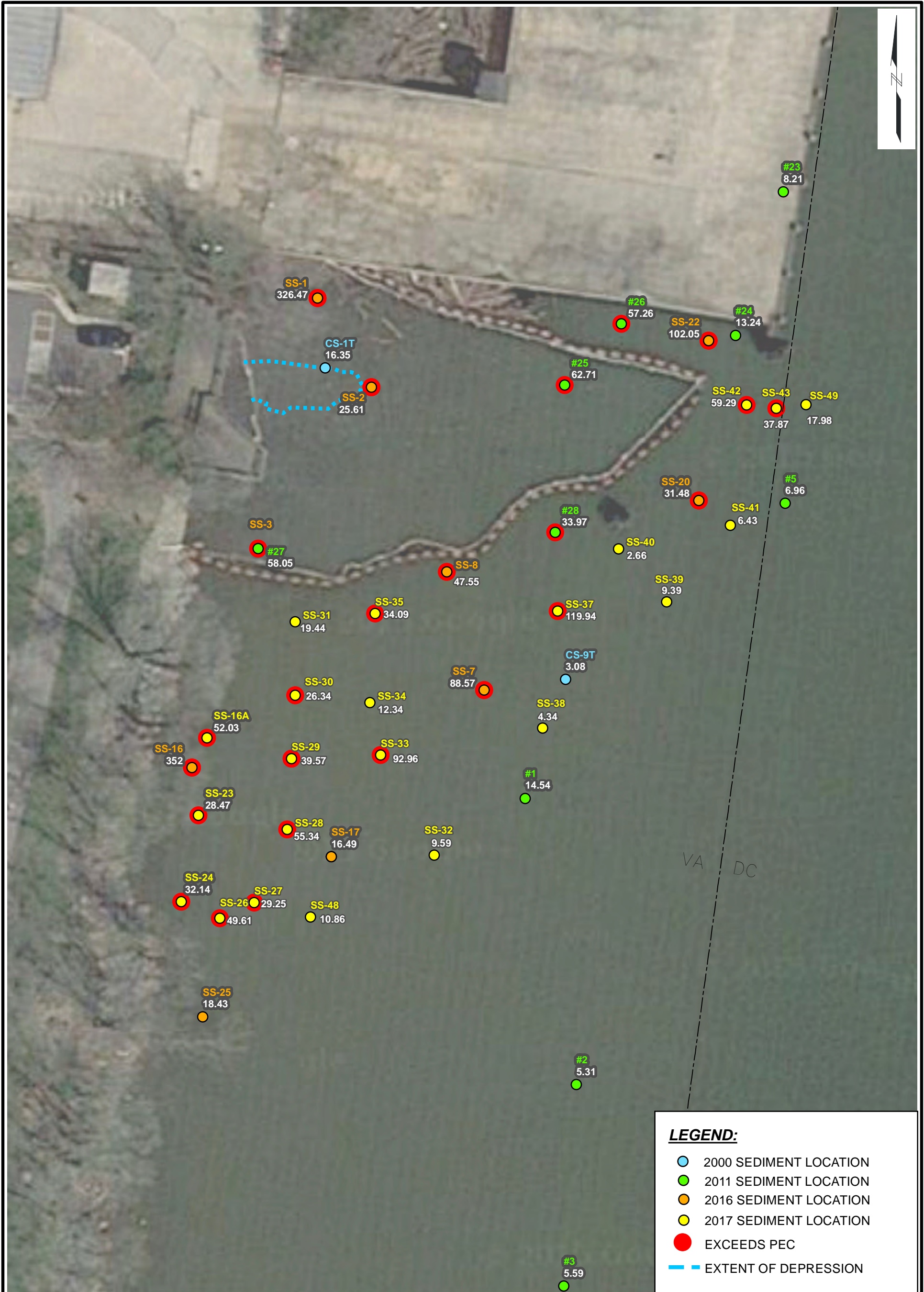
Fig. 1

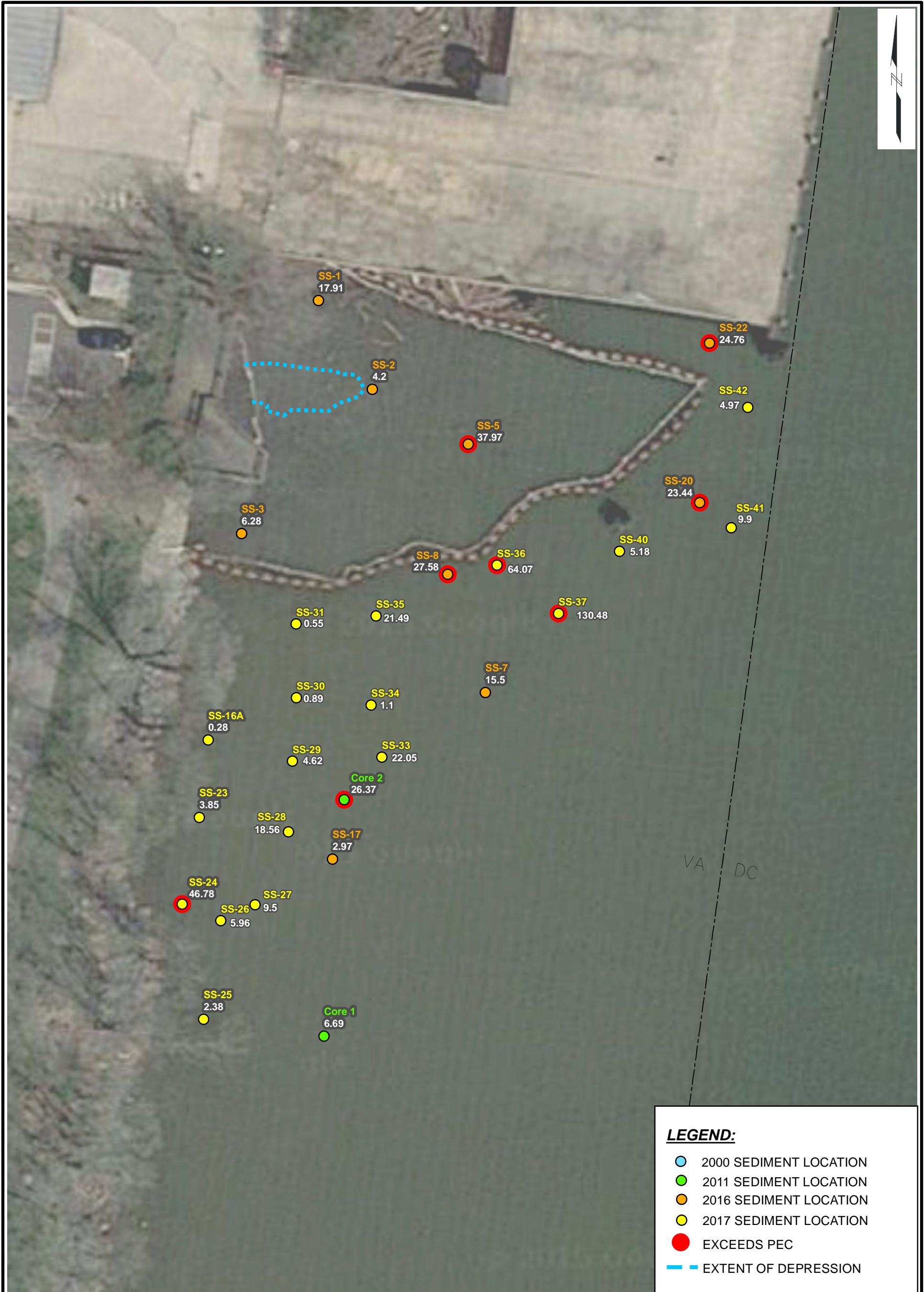


**SOURCE:**  
1. AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO  
ACCESSED 3/28/2016.  
2. PREVIOUS SAMPLE LOCATION DATA PRESENTED FROM  
THE 2001 PRELIMINARY SITE INVESTIGATION REPORT AND  
2013 REVISED REMEDIAL ACTION PLAN- OFF-SITE  
SEDIMENTS PREPARED BY MARSHALL MILLER.



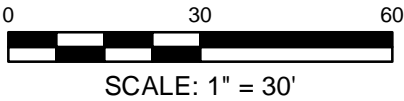
Alexandria Town Gas Oronoco Dredge & Capping Alexandria, Virginia		SAMPLE LOCATIONS	
City of Alexandria Alexandria, Virginia		Project 1604390 May 2017	Fig. 2






**NOTES:**  
1. ALL RESULTS PRESENTED IN MILLIGRAMS PER KILOGRAM (MG/KG)  
CONCENTRATIONS NORMALIZED BASED ON 1.9% TOTAL ORGANIC CARBON CONCENTRATION AS CALCULATED FROM AN AVERAGE OF THE BACKGROUND SAMPLE LOCATIONS PRESENTED IN THE 2013 REVISED REMEDIAL ACTION PLAN  
2. DATA FROM PREVIOUS SAMPLE LOCATIONS ARE SUMMARIZED FROM THE 2001 PRELIMINARY SITE ASSESSMENT AND 2013 REVISED REMEDIAL ACTION PLAN CONDUCTED BY MARSHALL MILLER AND ASSOCIATES.

**SOURCE:**  
1. AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO ACCESSED 3/28/2016.




Alexandria Town Gas Oronoco Dredge & Capping Alexandria, Virginia		SUMMARY OF NORMALIZED TOTAL PAHs- 2 FOOT		
		Project 1604390	May 2017	Fig. 4

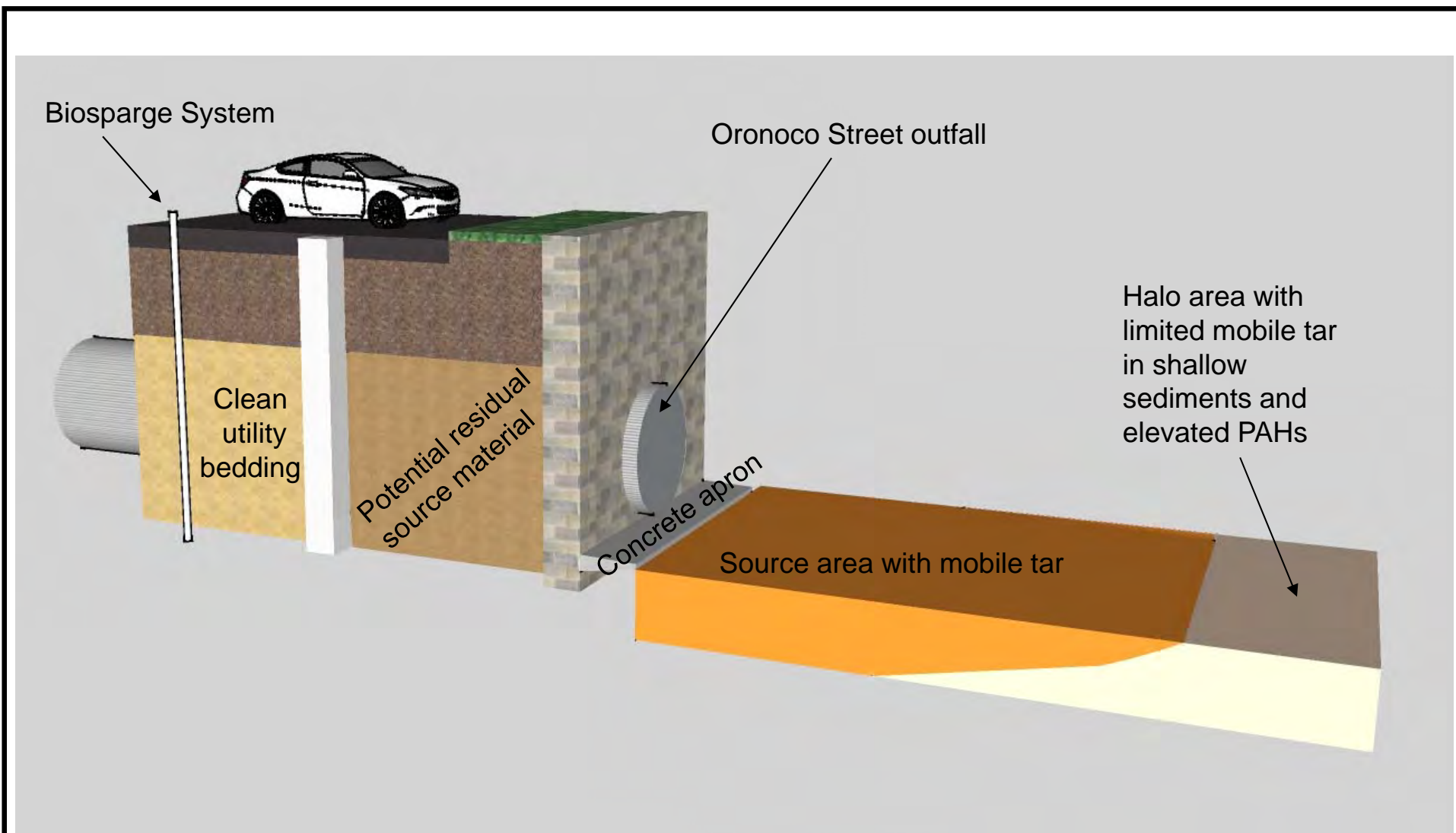


**NOTES:**  
1. ALL RESULTS PRESENTED IN MILLIGRAMS PER KILOGRAM (MG/KG)  
CONCENTRATIONS NORMALIZED BASED ON 1.9% TOTAL ORGANIC CARBON CONCENTRATION AS CALCULATED FROM AN AVERAGE OF THE BACKGROUND SAMPLE LOCATIONS PRESENTED IN THE 2013 REVISED REMEDIAL ACTION PLAN  
2. DATA FROM PREVIOUS SAMPLE LOCATIONS ARE SUMMARIZED FROM THE 2001 PRELIMINARY SITE ASSESSMENT AND 2013 REVISED REMEDIAL ACTION PLAN CONDUCTED BY MARSHALL MILLER AND ASSOCIATES.

**SOURCE:**  
1. AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO ACCESSED 3/28/2016.

0 30 60  
SCALE: 1" = 30'

Alexandria Town Gas Oronoco Dredge & Capping Alexandria, Virginia		SUMMARY OF NORMALIZED TOTAL PAHs- 3 FOOT	
		Project 1604390	May 2017
City of Alexandria Alexandria, Virginia			Fig. 5



SOURCE: Model created with SketchUp Pro 2016 ([www.sketchup.com](http://www.sketchup.com))

Alexandria Town Gas  
Oronoco Dredge & Capping  
Alexandria, Virginia

City of Alexandria  
Alexandria, Virginia



Project 1604390

CONCEPTUAL SITE MODEL

May 2017

Fig. 6

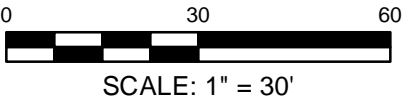


**NOTES:**  
1. DATA FROM PREVIOUS SAMPLE LOCATIONS ARE SUMMARIZED FROM THE 2001 PRELIMINARY SITE ASSESSMENT AND 2013 REVISED REMEDIAL ACTION PLAN CONDUCTED BY MARSHALL MILLER AND ASSOCIATES.

**SOURCE:**  
1. AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO ACCESSED 3/28/2016.

**LEGEND:**

- SAMPLE LOCATION
- PREVIOUS SAMPLE LOCATION
- 1' DREDGE AREA
- 2' DREDGE AREA
- 3' DREDGE AREA

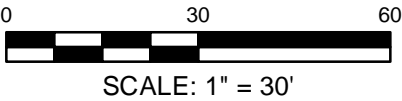



<p>Alexandria Town Gas Oronoco Dredge &amp; Capping Alexandria, Virginia</p> <p>City of Alexandria Alexandria, Virginia</p>	<p>GEI Consultants</p> <p>Project 1604390</p>	<p>PROPOSED REVISED DREDGE AREAS</p> <p>May 2017</p>	<p>Fig. 7</p>
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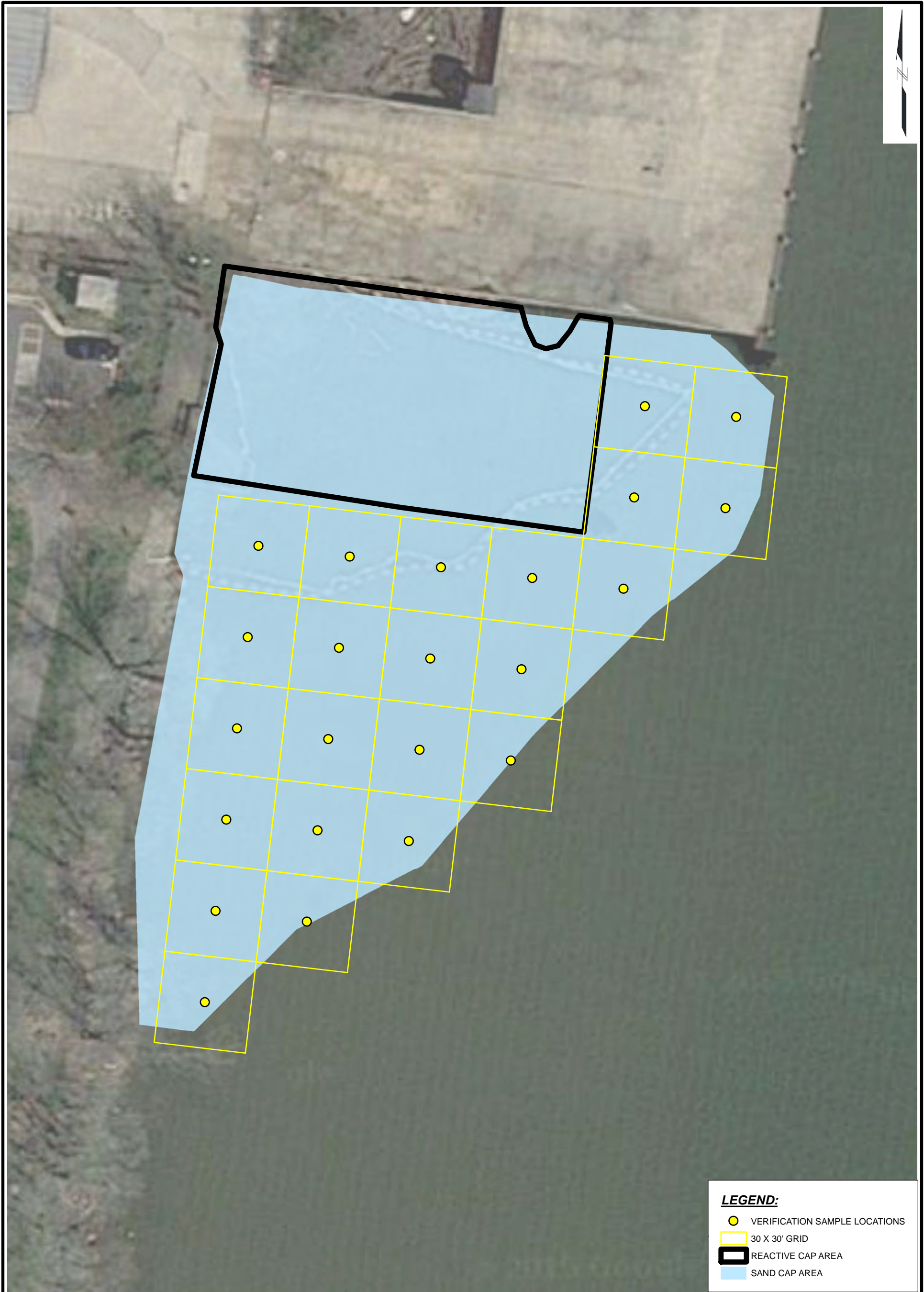


**NOTES:**  
1. DATA FROM PREVIOUS SAMPLE LOCATIONS ARE SUMMARIZED FROM THE 2001 PRELIMINARY SITE ASSESSMENT AND 2013 REVISED REMEDIAL ACTION PLAN CONDUCTED BY MARSHALL MILLER AND ASSOCIATES.

**SOURCE:**  
1. AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO ACCESSED 3/28/2016.



Alexandria Town Gas Oronoco Dredge & Capping Alexandria, Virginia	 <b>GEI</b> Consultants	PROPOSED REVISED REACTIVE CAP AREA
City of Alexandria Alexandria, Virginia		
Project 1604390	May 2017	Fig. 8




**NOTES:**  
1. DATA FROM PREVIOUS SAMPLE LOCATIONS ARE SUMMARIZED FROM THE 2001 PRELIMINARY SITE ASSESSMENT AND 2013 REVISED REMEDIAL ACTION PLAN CONDUCTED BY MARSHALL MILLER AND ASSOCIATES.

**SOURCE:**  
1. AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO ACCESSED 3/28/2016.

**LEGEND:**

- VERIFICATION SAMPLE LOCATIONS
- 30 X 30' GRID
- REACTIVE CAP AREA
- SAND CAP AREA

0 30 60  
SCALE: 1" = 30'

Alexandria Town Gas Oronoco Dredge & Capping Alexandria, Virginia		VERIFICATION SAMPLING GRID	
City of Alexandria Alexandria, Virginia	Project 1604390	May 2017	Fig. 9

## **Appendix A**

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### **Pre-Design Investigation Analytical Results**

Table 1. Sediment Analytical Results  
Oronoco Remedial Redesign Services  
City of Alexandria  
Alexandria, Virginia

Constituent	SS-26 (1) 4/5/2017		SS-26 (1) DUP 4/5/2017		SS-26 (2) 4/4/2017		SS-26 (3) 4/4/2017		SS-27 (1) 4/4/2017		SS-27 (2) 4/4/2017		SS-27 (3) 4/4/2017		SS-28 (1) 4/4/2017		SS-28 (2) 4/4/2017		SS-28 (3) 4/4/2017	
	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized
1-Methylnaphthalene	1.50	0.789	1.20	0.632	0.32	0.168	0.02	0.011	0.62	0.326	0.3	0.158	0.023	0.012	0.78	0.411	0.55	0.289	0.051	0.027
2-Methylnaphthalene	0.83	0.437	0.64	0.337	0.61	0.321	0.037	0.019	0.81	0.426	0.48	0.253	0.042	0.022	1.2	0.632	1.10 F1	0.579	0.032	0.017
Acenaphthene	8.70	4.579	7.50	3.947	1.3	0.684	0.032	0.017	8.8	4.632	1.1	0.579	0.030	0.016	11	5.789	4.6	2.421	0.190	0.100
Acenaphthylene	4.20	2.211	3.90	2.053	0.28	0.147	0.019	0.010	2.7	1.421	0.67	0.353	0.030	0.016	5.6	2.947	2	1.053	0.027	0.014
Anthracene	6.70	3.526	5.70	3.000	0.43	0.226	0.037	0.019	3.4	1.789	0.55	0.289	0.038	0.020	8.2	4.316	2.00 F1	1.053	0.022	0.012
Benzo(a)anthracene	5.60	2.947	5.20	2.737	0.42	0.221	0.065	0.034	2.7	1.421	0.81	0.426	0.057	0.030	5.3	2.789	1.70 F1	0.895	0.045	0.024
Benzo(a)pyrene	4.20	2.211	3.80	2.000	0.3	0.158	0.061	0.032	2.2	1.158	0.54	0.284	0.060	0.032	4.8	2.526	1.3	0.684	0.042	0.022
Benzo(b)fluoranthene	3.80	2.000	3.30	1.737	0.41	0.216	0.09	0.047	2.1	1.105	0.72	0.379	0.100	0.053	4.5	2.368	1.3	0.684	0.062	0.033
Benzo(g,h,i)perylene	0.98	0.516	0.89	0.468	0.085	0.045	0.026	0.014	0.37	0.195	0.12	0.063	0.022	0.012	1	0.526	0.34	0.179	0.017	0.009
Benzo(k)fluoranthene	1.20	0.632	1.10	0.579	0.16	0.084	0.038	0.020	0.55	0.289	0.21	0.111	0.034	0.018	2.1	1.105	0.42	0.221	0.027	0.014
Chrysene	5.20	2.737	4.50	2.368	0.4	0.211	0.074	0.039	2.6	1.368	0.77	0.405	0.073	0.038	4.6	2.421	1.60 F1	0.842	0.057	0.030
Dibenz(a,h)anthracene	0.48	0.253	0.45	0.237	0.035	0.018	9.9 J	5.211	0.18	0.095	0.054	0.028	0.0086 J	0.005	0.46	0.242	0.14	0.074	< 0.013	0.007
Fluoranthene	9.80	5.158	8.60	4.526	1.1	0.579	0.18	0.095	4.8	2.526	2.1	1.105	0.160	0.084	9.9	5.211	3	1.579	0.130	0.068
Fluorene	5.90	3.105	5.00	2.632	1.1	0.579	0.022	0.012	3.9	2.053	0.92	0.484	0.029	0.015	6.2	3.263	3	1.579	0.022	0.012
Indeno(1,2,3-cd)pyrene	1.00	0.526	0.94	0.495	0.043	0.023	0.021	0.011	0.2	0.105	0.081	0.043	0.013	0.007	0.54	0.284	0.33	0.174	0.015	0.008
Naphthalene	0.66	0.347	0.46	0.242	0.35	0.184	0.04	0.021	0.57	0.300	0.23	0.121	0.046	0.024	0.74	0.389	0.83	0.437	0.043	0.023
Phenanthrene	21.00	11.053	17.00	8.947	3.1	1.632	0.12	0.063	12	6.316	5.4	2.842	0.120	0.063	25	13.158	8.2	4.316	0.100	0.053
Pyrene	14.00	7.368	12.00	6.316	1.2	0.632	0.14	0.074	7.7	4.053	3.3	1.737	0.150	0.079	14	7.368	3.4	1.789	0.100	0.053
Total PAHs	94.25	49.61	80.98	42.62	11.32	5.96	1.00	5.74	55.58	29.25	18.06	9.50	1.01	0.53	105.14	55.34	28.86	18.56	0.94	0.50

**Notes:**  
Results are presented in mg/kg  
**Bolding** indicates a detected result concentration  
Shading indicates detected result concentration exceed the Probable Effect Concentration of 22.8 mg/kg  
F1 - MS and/or MSD recovery outside acceptance limits  
F2 - MS/MSD relative percent difference exceeds control limits  
J - The result is an estimated value.  
mg/kg - milligram per kilogram  
PAH - polycyclic aromatic hydrocarbon

Table 1. Sediment Analytical Results  
Oronoco Remedial Redesign Services  
City of Alexandria  
Alexandria, Virginia

Constituent	SS-29 (1) 4/4/2017		SS-29 (2) 4/4/2017		SS-29 (3) 4/4/2017		SS-30 (1) 4/5/2017		SS-30 (2) 4/5/2017		SS-30 (3) 4/5/2017		SS-31 (1) 4/5/2017		SS-31 (1) DUP 4/5/2017		SS-31 (2) 4/5/2017		SS-31 (3) 4/5/2017	
	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized
1-Methylnaphthalene	3.3	1.737	0.27	0.142	0.035	0.018	0.710	0.374	0.037	0.019	0.027	0.014	2.700	1.421	1.500	0.789	0.034	0.018	0.034	0.018
2-Methylnaphthalene	1.7	0.895	0.49	0.258	0.052	0.027	1.200	0.632	0.027	0.014	0.016	0.008	0.900	0.474	0.950	0.500	0.022	0.012	0.052	0.027
Acenaphthene	10	5.263	1.3	0.684	0.100	0.053	8.800	4.632	0.088	0.046	0.04	0.021	6.900	3.632	6.900	3.632	0.160	0.084	0.043	0.023
Acenaphthylene	2.3	1.211	0.38	0.200	0.062	0.033	2.000	1.053	0.092	0.048	0.06	0.032	1.100	0.579	1.200	0.632	0.027	0.014	0.043	0.023
Anthracene	4.2	2.211	0.41	0.216	0.088	0.046	3.100	1.632	0.067	0.035	0.044	0.023	2.200	1.158	2.400	1.263	0.029	0.015	0.056	0.029
Benzo(a)anthracene	3	1.579	0.41	0.216	0.120	0.063	2.200	1.158	0.130	0.068	0.073	0.038	1.600	0.842	1.600	0.842	0.062	0.033	0.081	0.043
Benzo(a)pyrene	2.3	1.211	0.32	0.168	0.100	0.053	1.700	0.895	0.120	0.063	0.067	0.035	1.100	0.579	1.100	0.579	0.057	0.030	0.073	0.038
Benzo(b)fluoranthene	1.9	1.000	0.4	0.211	0.150	0.079	1.600	0.842	0.150	0.079	0.072	0.038	1.100	0.579	1.100	0.579	0.080	0.042	0.100	0.053
Benzo(g,h,i)perylene	0.69	0.363	0.078	0.041	0.031	0.016	0.420	0.221	0.041	0.022	0.021	0.011	0.220	0.116	0.210	0.111	0.021	0.011	0.027	0.014
Benzo(k)fluoranthene	0.65	0.342	0.12	0.063	0.042	0.022	0.520	0.274	0.048	0.025	0.032	0.017	0.360	0.189	0.310	0.163	0.023	0.012	0.043	0.023
Chrysene	2.6	1.368	0.42	0.221	0.130	0.068	1.900	1.000	0.120	0.063	0.073	0.038	1.200	0.632	1.200	0.632	0.067	0.035	0.100	0.053
Dibenz(a,h)anthracene	0.31	0.163	0.038	0.020	0.012	0.006	0.210 J	0.111	0.016	0.008	0.008 J	0.004	0.100	0.053	0.100	0.053	0.0076 J	0.004	0.012	0.006
Fluoranthene	5.3	2.789	1	0.526	0.280	0.147	4.000	2.105	0.230	0.121	0.12	0.063	2.700	1.421	2.900	1.526	0.160	0.084	0.190	0.100
Fluorene	5	2.632	0.56	0.295	0.069	0.036	4.400	2.316	0.043	0.023	0.032	0.017	3.100	1.632	3.400	1.789	0.025	0.013	0.049	0.026
Indeno(1,2,3-cd)pyrene	0.77	0.405	0.052	0.027	0.019	0.010	0.450	0.237	0.041	0.022	0.019	0.010	0.140	0.074	0.140	0.074	0.019	0.010	0.018	0.009
Naphthalene	0.87	0.458	0.3	0.158	0.049	0.026	0.650	0.342	0.029	0.015	0.014	0.007	0.560	0.295	0.620	0.326	0.028	0.015	0.049	0.026
Phenanthrene	26	13.684	1.5	0.789	0.310	0.163	11.000	5.789	0.200	0.105	0.13	0.068	8.000	4.211	8.700	4.579	0.110	0.058	0.190	0.100
Pyrene	7.6	4.000	1	0.526	0.260	0.137	5.900	3.105	0.250	0.132	0.15	0.079	4.100	2.158	4.100	2.158	0.140	0.074	0.200	0.105
Total PAHs	75.19	39.57	8.78	4.62	1.87	0.99	49.84	26.34	1.69	0.89	0.96	0.51	35.38	18.62	36.93	19.44	1.03	0.55	1.33	0.70

**Notes:**  
Results are presented in mg/kg  
**Bolding** indicates a detected result concentration  
Shading indicates detected result concentration exceed the Probable Effect Concentration of 22.8 mg/kg  
F1 - MS and/or MSD recovery outside acceptance limits  
F2 - MS/MSD relative percent difference exceeds control limits  
J - The result is an estimated value.  
mg/kg - milligram per kilogram  
PAH - polycyclic aromatic hydrocarbon

Table 1. Sediment Analytical Results  
Oronoco Remedial Redesign Services  
City of Alexandria  
Alexandria, Virginia

Constituent	SS-32 (1) 4/4/2017		SS-33 (1) 4/4/2017		SS-33 (2) 4/4/2017		SS-33 (3) 4/4/2017		SS-34 (1) 4/4/2017		SS-34 (2) 4/4/2017		SS-34 (3) 4/4/2017		SS-35 (1) 4/5/2017		SS-35 (1) DUP 4/5/2017		SS-35 (2) 4/5/2017	
	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized
1-Methylnaphthalene	0.13	0.068	1.1	0.579	0.86	0.453	0.049	0.026	0.62	0.326	0.048	0.025	0.031	0.016	1.1 F1 F2	0.579	0.540	0.284	0.280	0.147
2-Methylnaphthalene	0.21	0.111	2.1	1.105	1.9	1.000	0.064	0.034	0.73	0.384	0.054	0.028	0.043	0.023	1.4 F1	0.737	0.820	0.432	0.410	0.216
Acenaphthene	0.78	0.411	31	16.316	6.8	3.579	0.099	0.052	4.3	2.263	0.130	0.068	0.050	0.026	13 F2	6.842	9.600	5.053	5.700	3.000
Acenaphthylene	2	1.053	4	2.105	1.1	0.579	0.052	0.027	0.89	0.468	0.072	0.038	0.044	0.023	1.9 F1 F2	1.000	1.800	0.947	1.200	0.632
Anthracene	0.91	0.479	8.8	4.632	2.7	1.421	0.077	0.041	1.4	0.737	0.074	0.039	0.055	0.029	4.1 F2	2.158	3.200	1.684	3.000	1.579
Benzo(a)anthracene	1.4	0.737	5.8	3.053	1.7	0.895	0.140	0.074	1	0.526	0.140	0.074	0.110	0.058	2.3 F1 F2	1.211	1.900	1.000	2.200	1.158
Benzo(a)pyrene	1.5	0.789	4.4	2.316	1.1	0.579	0.130	0.068	0.78	0.411	0.140	0.074	0.110	0.058	1.7 F1 F2	0.895	1.700	0.895	1.100	0.579
Benzo(b)fluoranthene	1.5	0.789	3.6	1.895	1.2	0.632	0.240	0.126	0.82	0.432	0.190	0.100	0.160	0.084	1.4 F1 F2	0.737	1.500	0.789	1.200	0.632
Benzo(g,h,i)perylene	0.38	0.200	1.2	0.632	0.23	0.121	0.044	0.023	0.17	0.089	0.047	0.025	0.038	0.020	0.56 F1 F2	0.295	0.470	0.247	0.210	0.111
Benzo(k)fluoranthene	0.64	0.337	1.4	0.737	0.44	0.232	0.056	0.029	0.28	0.147	0.068	0.036	0.065	0.034	0.55 F1 F2	0.289	0.470	0.247	0.440	0.232
Chrysene	1.3	0.684	5	2.632	1.2	0.632	0.170	0.089	0.99	0.521	0.140	0.074	0.130	0.068	2 F1 F2	1.053	1.700	0.895	2.000	1.053
Dibenz(a,h)anthracene	0.15	0.079	0.53	0.279	0.11	0.058	0.018	0.009	0.083	0.044	0.018	0.009	0.014	0.007	0.24 F1 F2	0.126	0.200	0.105	0.110	0.058
Fluoranthene	1.7	0.895	12	6.316	3.4	1.789	0.490	0.258	2	1.053	0.340	0.179	0.270	0.142	4.6 F2	2.421	3.300	1.737	4.100	2.158
Fluorene	0.84	0.442	8.1	4.263	3.2	1.684	0.055	0.029	1.9	1.000	0.048	0.025	0.034	0.018	5.8 F2	3.053	4.500	2.368	3.000	1.579
Indeno(1,2,3-cd)pyrene	0.25	0.132	1.2	0.632	0.11	0.058	0.023	0.012	0.12	0.063	0.035	0.018	0.029	0.015	0.58 F1 F2	0.305	0.490	0.258	0.120	0.063
Naphthalene	0.16	0.084	1.5	0.789	1.3	0.684	0.066	0.035	0.38	0.200	0.069	0.036	0.048	0.025	0.65	0.342	0.450	0.237	0.250	0.132
Phenanthrene	1.9	1.000	57	30.000	11	5.789	0.280	0.147	5.1	2.684	0.250	0.132	0.190	0.100	17	8.947	13.000	6.842	10.000	5.263
Pyrene	2.6	1.368	29	15.263	4.4	2.316	0.350	0.184	2.5	1.316	0.270	0.142	0.210	0.111	7 F2	3.684	4.900	2.579	5.800	3.053
Total PAHs	18.22	9.59	176.63	92.96	41.89	22.05	2.35	1.24	23.44	12.34	2.09	1.10	1.60	0.84	64.78	34.09	50.00	26.32	40.84	21.49

**Notes:**  
Results are presented in mg/kg  
**Bolding** indicates a detected result concentration  
Shading indicates detected result concentration exceed the Probable Effect Concentration of 22.8 mg/kg  
F1 - MS and/or MSD recovery outside acceptance limits  
F2 - MS/MSD relative percent difference exceeds control limits  
J - The result is an estimated value.  
mg/kg - milligram per kilogram  
PAH - polycyclic aromatic hydrocarbon

Table 1. Sediment Analytical Results  
Oronoco Remedial Redesign Services  
City of Alexandria  
Alexandria, Virginia

Constituent	SS-35 (3) 4/5/2017		SS-36 (1.5) 4/4/2017		SS-36 (2.5) 4/4/2017		SS-36 (3.5) 4/4/2017		SS-37 (1) 4/4/2017		SS-37 (2) 4/4/2017		SS-37 (2.5) 4/4/2017		SS-38 (1) 4/5/2017		SS-39 (1) 4/4/2017		SS-40 (1) 4/5/2017	
	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized
1-Methylnaphthalene	0.025	0.013	2.4	1.263	0.59	0.311	0.18	0.095	27	14.211	25	13.158	0.86	0.453	0.270	0.142	1	0.526	0.300	0.158
2-Methylnaphthalene	0.031	0.016	4	2.105	0.71	0.374	0.25	0.132	35	18.421	35	18.421	2.5	1.316	0.300	0.158	0.37	0.195	0.190	0.100
Acenaphthene	0.089	0.047	24	12.632	2	1.053	0.22	0.116	15	7.895	22	11.579	7.4	3.895	1.100	0.579	0.72	0.379	0.930	0.489
Acenaphthylene	0.028	0.015	3.5	1.842	0.2	0.105	0.26	0.137	14	7.368	9.2	4.842	0.82	0.432	0.430	0.226	1.8	0.947	0.190	0.100
Anthracene	0.035	0.018	6.1	3.211	0.19	0.100	0.27	0.142	11	5.789	12	6.316	1.9	1.000	0.280	0.147	0.89	0.468	0.140	0.074
Benzo(a)anthracene	0.072	0.038	4.7	2.474	0.22	0.116	0.46	0.242	13	6.842	10	5.263	0.91	0.479	0.330	0.174	1.2	0.632	0.210	0.111
Benzo(a)pyrene	0.071	0.037	3.5	1.842	0.2	0.105	0.46	0.242	13	6.842	9.1	4.789	0.85	0.447	0.320	0.168	1.4	0.737	0.210	0.111
Benzo(b)fluoranthene	0.12	0.063	3.4	1.789	0.27	0.142	0.62	0.326	12	6.316	8.1	4.263	0.93	0.489	0.350	0.184	1.4	0.737	0.250	0.132
Benzo(g,h,i)perylene	0.026	0.014	0.93	0.489	0.058	0.031	0.13	0.068	3.2	1.684	2.2	1.158	0.21	0.111	0.084	0.044	0.39	0.205	0.065	0.034
Benzo(k)fluoranthene	0.037	0.019	0.96	0.505	0.074	0.039	0.21	0.111	4.4	2.316	2.3	1.211	0.18	0.095	0.130	0.068	0.51	0.268	0.081	0.043
Chrysene	0.086	0.045	4.2	2.211	0.24	0.126	0.45	0.237	11	5.789	9.2	4.842	0.82	0.432	0.310	0.163	1.2	0.632	0.240	0.126
Dibenz(a,h)anthracene	0.0096 J	0.005	0.42	0.221	0.022	0.012	0.053	0.028	1.3	0.684	0.92	0.484	0.097	0.051	0.036	0.019	0.16	0.084	0.025	0.013
Fluoranthene	0.17	0.089	8.8	4.632	0.64	0.337	0.83	0.437	19	10.000	20	10.526	2	1.053	0.620	0.326	2.1	1.105	0.560	0.295
Fluorene	0.031	0.016	6.5	3.421	0.48	0.253	0.16	0.084	10	5.263	14	7.368	3.2	1.684	0.710	0.374	0.58	0.305	0.390	0.205
Indeno(1,2,3-cd)pyrene	0.017	0.009	0.93	0.489	0.029	0.015	0.069	0.036	1.2	0.632	0.9	0.474	0.1	0.053	0.042	0.022	0.17	0.089	0.061	0.032
Naphthalene	0.032	0.017	1.8	0.947	0.41	0.216	0.12	0.063	0.79	0.416	1	0.526	1.1	0.579	0.200	0.105	0.16	0.084	0.046	0.024
Phenanthrene	0.13	0.068	36	18.947	0.8	0.421	0.84	0.442	36	18.947	59	31.053	7.6	4.000	1.900	1.000	2	1.053	0.850	0.447
Pyrene	0.15	0.079	12	6.316	0.61	0.321	0.87	0.458	28	14.737	33	17.368	2.7	1.421	1.100	0.579	2.8	1.474	0.610	0.321
Total PAHs	1.13	0.60	121.74	64.07	7.15	3.76	6.27	3.30	227.89	119.94	247.92	130.48	33.32	17.54	8.24	4.34	17.85	9.39	5.05	2.66

**Notes:**  
Results are presented in mg/kg  
**Bolding** indicates a detected result concentration  
Shading indicates detected result concentration exceed the Probable Effect Concentration of 22.8 mg/kg  
F1 - MS and/or MSD recovery outside acceptance limits  
F2 - MS/MSD relative percent difference exceeds control limits  
J - The result is an estimated value.  
mg/kg - milligram per kilogram  
PAH - polycyclic aromatic hydrocarbon

Table 1. Sediment Analytical Results  
Oronoco Remedial Redesign Services  
City of Alexandria  
Alexandria, Virginia

Constituent	SS-40 (2) 4/4/2017		SS-40 (3) 4/4/2017		SS-41 (1) 4/4/2017		SS-41 (2) 4/4/2017		SS-42 (1) 4/5/2017		SS-42 (2) 4/5/2017		SS-43 (1) 4/5/2017		SS-48 (1) 4/5/2017	
	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized	Raw	Normalized
1-Methylnaphthalene	0.38	0.200	0.6	0.316	1.90 F1	1.000 F1	3.50	1.842	16.00	8.421	1.60	0.842	14.00	7.368	0.45	0.237
2-Methylnaphthalene	0.52	0.274	1.6	0.842	2.40 F1	1.263 F1	4.50	2.368	23.00	12.105	1.80	0.947	20.00	10.526	0.77	0.405
Acenaphthene	1.9	1.000	2.8	1.474	0.82 F1	0.432 F1	1.30	0.684	8.10	4.263	0.64	0.337	5.30	2.789	4.50	2.368
Acenaphthylene	0.5	0.263	0.31	0.163	0.92 F1	0.484 F1	1.10	0.579	5.30	2.789	0.52	0.274	3.50 F1	1.842	0.52	0.274
Anthracene	0.35	0.184	1.3	0.684	0.45 F1	0.237 F1	0.94	0.495	5.10	2.684	0.44	0.232	2.50 F1	1.316	1.30	0.684
Benzo(a)anthracene	0.45	0.237	0.36	0.189	0.65 F1	0.342 F1	0.87	0.458	5.00	2.632	0.38	0.200	2.80 F1	1.474	0.40	0.211
Benzo(a)pyrene	0.42	0.221	0.27	0.142	0.74 F1	0.389 F1	0.87	0.458	4.80	2.526	0.39	0.205	2.60 F1	1.368	0.34	0.179
Benzo(b)fluoranthene	0.44	0.232	0.29	0.153	0.74 F1	0.389 F1	0.97	0.511	4.40	2.316	0.48	0.253	2.30 F1	1.211	0.36	0.189
Benzo(g,h,i)perylene	0.098	0.052	0.065	0.034	0.23	0.121	0.22	0.116	1.40	0.737	0.11	0.058	1.00	0.526	0.09	0.045
Benzo(k)fluoranthene	0.2	0.105	0.13	0.068	0.28	0.147	0.40	0.211	1.20	0.632	0.16	0.084	0.98	0.516	0.13	0.068
Chrysene	0.44	0.232	0.35	0.184	0.67 F1	0.353 F1	0.89	0.468	4.40	2.316	0.39	0.205	2.70 F1	1.421	0.37	0.195
Dibenz(a,h)anthracene	0.042	0.022	0.027	0.014	0.091	0.048	0.09	0.049	0.55	0.289	0.05	0.024	0.38	0.200	0.04	0.021
Fluoranthene	0.73	0.384	1.2	0.632	0.97 F1	0.511 F1	1.40	0.737	8.60	4.526	0.80	0.421	4.80	2.526	1.00	0.526
Fluorene	0.88	0.463	1.5	0.789	0.52	0.274	0.94	0.495	5.10	2.684	0.48	0.253	2.90 F1	1.526	2.30	1.211
Indeno(1,2,3-cd)pyrene	0.069	0.036	0.033	0.017	0.20 F1	0.105 F1	0.15	0.079	1.40	0.737	0.06	0.032	1.00	0.526	0.04	0.023
Naphthalene	0.37	0.195	0.88	0.463	0.16	0.084	0.37	0.195	6.30	3.316	0.15	0.079	3.90	2.053	0.48	0.253
Phenanthrene	1.6	0.842	4.8	2.526	1.10 F1	0.579 F1	2.40	1.263	16.00	8.421	1.50	0.789	8.30	4.368	6.40	3.368
Pyrene	0.84	0.442	1.6	0.842	1.30 F1	0.684 F1	1.40	0.737	12.00	6.316	1.10	0.579	7.00	3.684	1.60	0.842
Total PAHs	9.85	5.18	17.52	9.22	12.24	6.43	18.81	9.90	112.65	59.29	9.45	4.97	71.96	37.87	20.64	10.86

**Notes:**  
Results are presented in mg/kg  
**Bolding** indicates a detected result concentration  
Shading indicates detected result concentration exceed the Probable Effect Concentration of 22.8 mg/kg  
F1 - MS and/or MSD recovery outside acceptance limits  
F2 - MS/MSD relative percent difference exceeds control limits  
J - The result is an estimated value.  
mg/kg - milligram per kilogram  
PAH - polycyclic aromatic hydrocarbon

## Appendix B

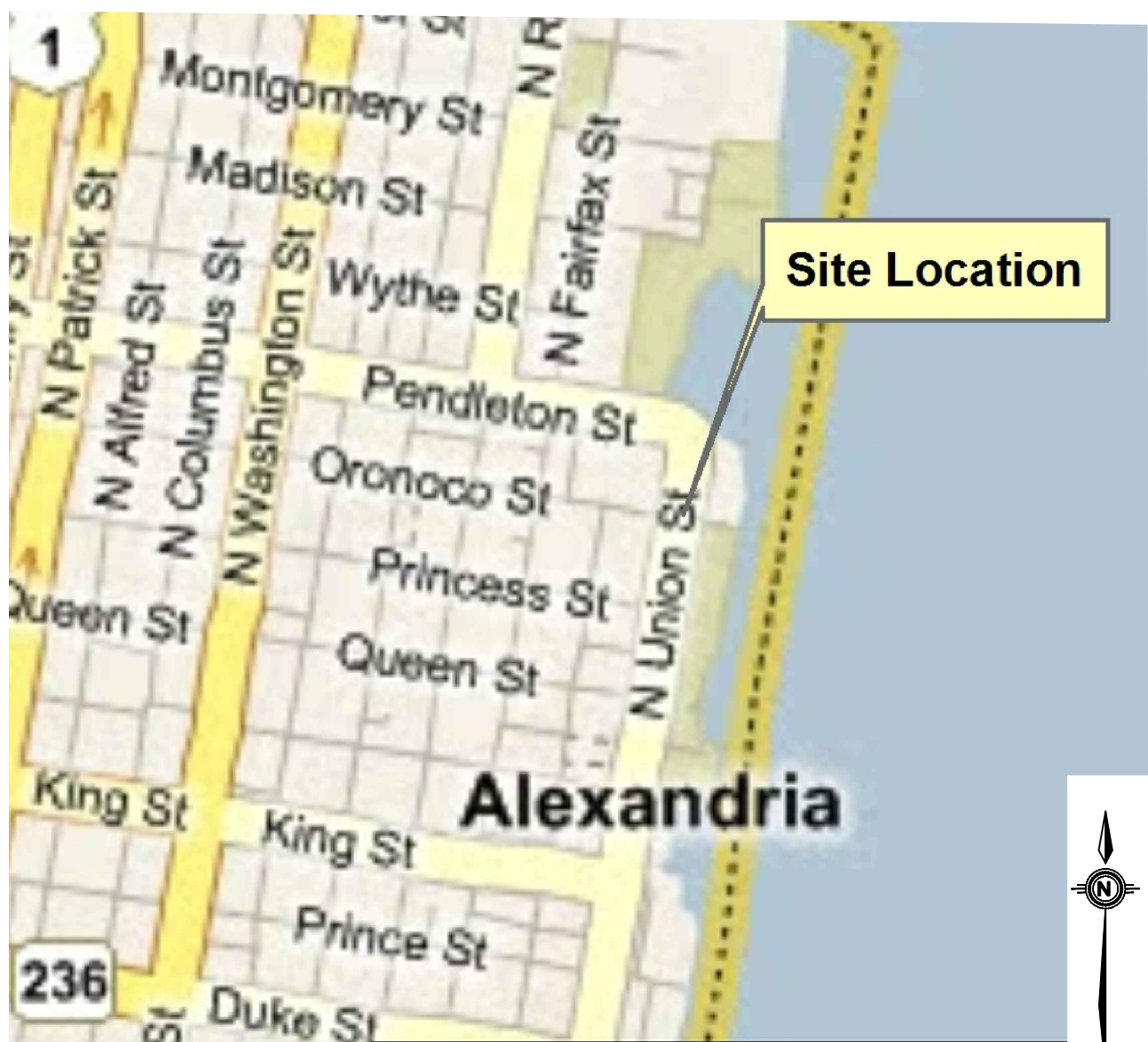
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### Contract Documents

# CITY OF ALEXANDRIA, VIRGINIA



## ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION PLANS



MAP SOURCE:  
MICROSOFT BING MAPS 2010 MICROSOFT CORPORATION  
WWW.BING.COM/MAPS

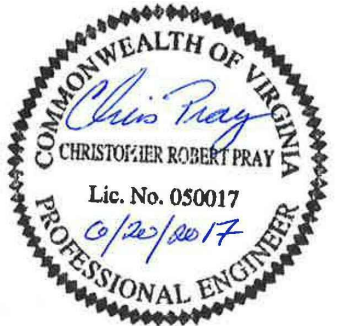
VICINITY MAP  
SCALE: 1 INCH = 1,000 FEET  
1,000' 0 1,000'

VA. COORDINATE  
SYSTEM OF 1983



LOCATION MAP  
SCALE: 1 INCH = 50 FEET  
50' 0 50'

VA. COORDINATE  
SYSTEM OF 1983



DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES.	
APPROVED	
X	DATE:
DIRECTOR	
RECOMMENDED FOR APPROVAL	
X	DATE:
DEPUTY DIRECTOR OF OPERATIONS	
RECOMMENDED FOR APPROVAL	
X	DATE:
DEPUTY DIRECTOR OF INFRASTRUCTURE & ENVIRONMENT	
RECOMMENDED FOR APPROVAL	
X	DATE:
DEPUTY DIRECTOR OF TRANSPORTATION	
DEPARTMENT OF PROJECT IMPLEMENTATION	
APPROVED	
X	DATE:
DIRECTOR	
RECOMMENDED FOR APPROVAL	
X	DATE:
DIVISION CHIEF CONSTRUCTION	

### PROJECT DESCRIPTION:

- THESE CONTRACT DOCUMENTS REPRESENT DESIGNS, METHODS AND MATERIALS USED TO A) DREDGE, REMOVE AND PROPERLY DISPOSE OF SHALLOW, NEAR-SHORE SEDIMENTS THAT HAVE BEEN AFFECTED BY COAL-TAR CONSTITUENTS; B) INSTALL A REPLACEMENT CAP DESIGNED TO RESTORE THE VOID LEFT BY DREDGING, PROTECT AGAINST POTENTIAL FUTURE RE-CONTAMINATION BY COAL-TAR CONSTITUENTS, ARMOR THE REPLACEMENT MATERIALS AGAINST WIND/WAVE ACTION, AND PROMOTE THE RE-ESTABLISHMENT OF A NATURALIZED APPEARANCE; AND C) RESTORE THE ONSHORE PORTIONS OF THE SITE TO THEIR APPROXIMATE ORIGINAL APPEARANCE.
- DRAWING SET HAS ACCOMPANYING FILES:
  - SPECIFICATIONS BOOK
  - CITY OF ALEXANDRIA
  - DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES

SHEET INDEX		
SHEET NO.	DRAWING NUMBER	SHEET NAME
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FINAL DESIGN



CITY OF ALEXANDRIA, VIRGINIA  
DEPARTMENT OF PROJECT IMPLEMENTATION  
301 KING STREET  
ALEXANDRIA, VIRGINIA 22313

REVISIONS	DATE	BY	DESCRIPTION
	06/20/17	CP	DREDGE AREA

ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION

ALEXANDRIA PROJECT NO.: 1504002	DATE OF PLAN ISSUANCE: 08/26/16
CONSULTANT PROJECT ID: 1604390	DESIGNED BY: CRP DATE: 08/26/16
	DRAWN BY: TBM DATE: 08/26/16
	CHECKED BY: PDL DATE: 08/26/16
	APPROVED BY: CRP DATE: 08/26/16

COVER SHEET

SHEET  
G00  
SCALE: AS SHOWN

1. THE SUBJECT SITE IS LOCATED WITHIN THE RIGHT OF WAY OF THE ZERO BLOCK OF ORONOCO STREET AND ADJOINING PORTION OF THE POTOMAC RIVER
2. OWNER: CITY OF ALEXANDRIA
3. ADDRESS: ZERO BLOCK OF ORONOCO STREET SOUTH OF NORTH UNION STREET
4. AREA TABULATION (TOTAL DISTURBED AREA): ~0.51 AC (22,215 SQUARE FEET)

THE NATURAL SOILS IN THE PROPOSED DREDGE AREA CONSIST OF SOFT CLAYEY SILTS AND SILTY CLAYS WITH SOME ORGANICS; PLEASE REFER TO THE 02/05/2014 GEOTECHNICAL STUDY FOR NOTES ON SOIL CONDITIONS.

5. THE SITE IS LOCATED IN THE POTOMAC RIVER WATERSHED.
6. CONSTRUCTION PERMITS ARE REQUIRED FOR THIS PROJECT. THE APPROVED SITE PLAN MUST BE ATTACHED TO THE PERMIT APPLICATION THAT FULLY DETAILS THE CONSTRUCTION AS WELL AS LAYOUTS AND SCHEMATICS OF ANY MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS.
7. ALL PUBLIC AND PRIVATE EASEMENTS OR ALL KNOWN PUBLIC AND PRIVATE EASEMENTS, INCLUDING ALL UTILITY, EGRESS, AND CONSERVATION RESTRICTIONS ARE SHOWN. THE APPLICANT SHALL NOT CONSTRUCT ANY PERMANENT STRUCTURES OVER ANY EXISTING OR PROPOSED PUBLIC AND/OR PRIVATE EASEMENTS UNLESS OTHERWISE APPROVED BY THE PLANNING COMMISSION AND CITY OF ALEXANDRIA COUNCIL.
8. PLAT SUBJECT TO RESTRICTIONS OF RECORD.
9. ALL NEW CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ALEXANDRIA AND TO THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE (USBC).
10. PRIOR TO COMMENCING NEW WORK, THE CONTRACTOR SHALL PROTECT FROM DAMAGE ALL EXISTING ADJACENT AREAS. IF CITY'S EXISTING PUBLIC INFRASTRUCTURE, INCLUDING BUT NOT LIMITED, TO STREETS, ALLEYS, DRIVEWAY APRONS, SANITARY AND STORM SEWERS, STREET LIGHTING, TRAFFIC AND PEDESTRIAN SIGNALS, SIDEWALKS, CURB AND GUTTER, AND STORM WATER DROP INLET STRUCTURES ARE DAMAGED BY THE CONTRACTOR OR BY ACTIVITIES RELATING TO THE SITE CONSTRUCTION THEN THE APPLICANT SHALL REPAIR THE SAME TO THE SATISFACTION OF DIRECTOR, TRANSPORTATION AND ENVIRONMENTAL SERVICES (T&ES). A PRE-CONSTRUCTION WALK/SURVEY OF THE SITE SHALL OCCUR WITH CONSTRUCTION AND INSPECTION STAFF TO DOCUMENT EXISTING CONDITIONS PRIOR TO ANY LAND DISTURBING ACTIVITY.
11. ALL IMPROVEMENTS TO THE CITY'S RIGHT-OF-WAY SUCH AS CURB, GUTTER, SIDEWALK, AND DRIVEWAY APRONS, ETC., ARE DESIGNED PER THE CITY OF ALEXANDRIA STANDARDS AND SPECIFICATIONS.
12. ALL STREET CUT AND PATCH WORK LOCATED IN PUBLIC RIGHT-OF-WAYS, REQUIRED FOR ANY UTILITY INSTALLATION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CITY OF ALEXANDRIA STANDARDS AND SPECIFICATIONS AND TO THE SATISFACTION OF THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES (T&ES).
13. CONTRACTOR MUST ENSURE THAT THERE IS NO DISTURBANCE ON ADJACENT PROPERTIES WITHOUT RECORDED EASEMENT OR NOTARIZED LETTER OF PERMISSION FROM THE ADJACENT PROPERTY OWNERS.
14. ALL REQUIRED STATE AND FEDERAL PERMITS, WHICH COULD INCLUDE PERMITS FROM THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION (VDCR), VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ), VIRGINIA DEPARTMENT OF HISTORIC RESOURCES (VDHR), UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA), ARMY CORPS OF ENGINEERS AND VIRGINIA MARINE RESOURCES, MUST BE IN PLACE FOR ALL PROJECT CONSTRUCTION AND MITIGATION WORK PRIOR TO RELEASE OF THE FINAL SITE PLAN. THIS INCLUDES THE STATE REQUIREMENT FOR A VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) GENERAL PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITIES FOR LAND DISTURBING ACTIVITIES GREATER THAN 2,500. INFORMATION REGARDING THE VSMP GENERAL PERMIT CAN BE FOUND ONLINE AT: [HTTP://WWW.DCR.VIRGINIA.GOV/SOIL\\_AND\\_WATER/VSMP.SHTML](http://www.dcr.virginia.gov/soil_and_water/vsmp.shtmL).
15. PERMITS FROM THE CITY OF ALEXANDRIA OFFICE OF ENVIRONMENTAL QUALITY (OEQ), TRANSPORTATION AND ENVIRONMENTAL SERVICES (T&ES), AND BUILDING AND FIRE CODE ADMINISTRATION SHALL BE OBTAINED BY THE APPLICANT, AS REQUIRED AND DOCUMENTED HEREIN. THE CONTRACTOR CAN CONTACT ALEXANDRIA FIRE AND CODE ADMINISTRATION DEPARTMENT AT (703) 838-4644 OR (703) 746-4200 FOR ANY QUESTIONS OR ADDITIONAL INFORMATION.
16. ANY WORK IN THE PUBLIC RIGHT OF WAY SHALL REQUIRE A SEPARATE PERMIT FROM THE DIRECTOR, TRANSPORTATION AND ENVIRONMENTAL SERVICES. THE CONTRACTOR CAN CONTACT THE DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES AT (703) 746-4035 FOR ANY QUESTIONS OR ADDITIONAL INFORMATION.
17. ALL WATER FACILITY CONSTRUCTION SHALL CONFORM TO VIRGINIA AMERICAN WATER COMPANY STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL CONTACT VIRGINIA AMERICAN WATER COMPANY AT (703) 549-7080 TO COORDINATE CONSTRUCTION AND INSPECTION OF WATER FACILITIES.
18. THE SIDEWALKS SHALL REMAIN OPENED DURING CONSTRUCTION OR PEDESTRIAN ACCESS SHALL BE MAINTAINED TO THE SATISFACTION OF THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES THROUGHOUT THE CONSTRUCTION OF THE PROJECT.
19. PRIOR TO THE RELEASE OF THE FINAL SITE PLAN, A TRAFFIC CONTROL PLAN FOR CONSTRUCTION DETAILING PROPOSED CONTROLS TO TRAFFIC MOVEMENT, LANE CLOSURES, CONSTRUCTION ENTRANCES, HAUL ROUTES, AND STORAGE AND STAGING SHALL BE PROVIDED FOR INFORMATION PURPOSE; HOWEVER, AN AMENDED TRAFFIC CONTROL PLAN, IF REQUIRED BY THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES SHALL BE SUBMITTED TO THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES ALONG WITH THE BUILDING PERMIT APPLICATION. THE FINAL SITE PLAN SHALL INCLUDE A STATEMENT "FOR INFORMATION ONLY" ON THE TRAFFIC CONTROL PLAN SHEETS.



1. THIS NOTE SECTION IS ONLY APPLICABLE IF LANDSCAPE AREAS ARE DAMAGED BY THE CONTRACTOR AND REQUIRE RESTORATION AT THE CONCLUSION OF THE WORK.
2. AN EROSION AND SEDIMENT CONTROL PLAN MUST BE APPROVED BY THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES PRIOR TO ANY LAND DISTURBING ACTIVITY GREATER THAN 2,500 SQUARE FEET.
3. ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE CITY OF ALEXANDRIA AND VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), VIRGINIA REGULATIONS §4VAC50-30 EROSION AND SEDIMENT CONTROL REGULATIONS.
4. AN EROSION AND SEDIMENT CONTROL PLAN IS INCLUDED WITH THESE FINAL PLANS FOR APPROVAL BY THE DIRECTOR, TRANSPORTATION AND ENVIRONMENTAL SERVICES FOR REFERENCE BY THE EROSION AND SEDIMENT CONTROL PERMIT.
5. A "CERTIFIED LAND DISTURBER" (CLD) SHALL BE NAMED IN A LETTER TO THE DIVISION CHIEF OF CONSTRUCTION AND INSPECTION (C&I), DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES PRIOR TO ANY LAND DISTURBING ACTIVITIES. IF THE CLD CHANGES DURING THE PROJECT, THAT CHANGE MUST BE NOTED IN A LETTER TO THE DIVISION CHIEF. A NOTE TO THIS EFFECT SHALL BE PLACED ON THE PHASE I EROSION AND SEDIMENT CONTROL SHEETS ON THE SITE PLAN.
6. THE DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES, CONSTRUCTION AND INSPECTION (C&I) DIVISION MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENTS OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION. THE RESPONSIBLE CERTIFIED LAND DISTURBER (CLD) SHALL ATTEND THE PRE-CONSTRUCTION MEETING.
7. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND ALL OTHER EROSION AND SEDIMENT CONTROL MEASURES INTENDED TO CONTROL EROSION AND TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
8. CONSTRUCTION SHALL BE SEQUENCED SUCH THAT GRADING OPERATION CAN BEGIN AND END AS QUICKLY AS POSSIBLE. AREAS NOT TO BE DISTURBED MUST BE CLEARLY MARKED OR FLAGGED.
9. AN INSPECTION BY THE CITY OF ALEXANDRIA IS REQUIRED AFTER INITIAL INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND BEFORE ANY CLEARING OR GRADING CAN BEGIN.
10. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
11. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN THOSE INDICATED ON THESE PLANS INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS, THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE CITY OF ALEXANDRIA.
12. THE DEVELOPER AND CONTRACTORS ARE TO KEEP DENUDED AREAS TO A MINIMUM. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR. ANY STOCKPILED MATERIAL WHICH WILL REMAIN IN PLACE LONGER THAN 10 DAYS MUST BE SEEDED FOR TEMPORARY VEGETATION AND MULCHED WITH STRAW MULCH OR OTHERWISE STABILIZED.
13. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
14. DURING DEWATERING OPERATIONS, WATER SHALL BE PUMPED THROUGH AN APPROVED FILTERING DEVICE OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY IMPACT FLOWING STREAMS OR OFF-SITE PROPERTY.
15. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES DAILY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
16. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES AS NECESSARY TO PREVENT EROSION AND SEDIMENTATION AND AS DETERMINED BY THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL (T&ES) SERVICES OF THE CITY OF ALEXANDRIA.
17. ANY DENUDED SLOPES, EITHER DISTURBED OR CREATED BY THIS PLAN THAT EXCEED 2500 SQUARE FEET SHALL BE SODDED AND PEGGED FOR STABILITY AND EROSION CONTROL. AT THE COMPLETION OF THE PROJECT AND PRIOR TO THE RELEASE OF THE BOND, ALL DISTURBED AREAS SHALL BE STABILIZED PERMANENTLY AND ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED.
18. INSTALL FIBER ROLL INLET PROTECTION.
19. DUST CONTROL SHALL BE ACCOMPLISHED BY TEMPORARY VEGETATIVE COVER AND BY IRRIGATION AS NEEDED.
20. ALL VEHICLES WILL BE CLEANED BEFORE ENTERING ONTO THE PUBLIC RIGHT-OF-WAY.

1. ALL PROTECTION AND PRESERVATION MEASURES FOR EXISTING VEGETATION, INCLUDING MAINTENANCE AND PENALTIES SHALL BE PREPARED IN COMPLIANCE WITH LANDSCAPE GUIDELINES OF THE CITY OF ALEXANDRIA AND APPROVED BY THE CITY ARBORIST IN-FIELD PRIOR TO COMMENCEMENT OF ANY SITE DISTURBING AND CONSTRUCTION ACTIVITIES.
2. ALL VEGETATION PRESERVATION AND PROTECTION METHODS SHALL BE APPROVED/VERIFIED IN FIELD BY THE CITY ARBORIST PRIOR TO COMMENCEMENT OF ANY GROUND DISTURBING ACTIVITY.
3. LOCATION AND METHOD FOR PROTECTION AND PRESERVATION OF EXISTING TREES WILL BE SHOWN ON SEDIMENT AND EROSION CONTROL AND LANDSCAPE PLAN SHEETS.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE SURE THAT ANY EXISTING LANDSCAPING WHICH IS TO BE RELOCATED ON THE SITE WILL BE CAREFULLY STORED IN A DESIGNATED AREA BEFORE BEING REPLANTED. COORDINATION WITH THE OWNER FOR MUTUALLY AGREEABLE STORAGE LOCATIONS FOR LANDSCAPE MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF PLANT MATERIAL THAT DOES NOT SURVIVE STORAGE AND REPLANTING.
5. INCLUDE SPECIFIC CONSTRUCTION STAGING INFORMATION ON THE PLAN THAT INDICATES THE METHODS, AND PROCEDURES TO BE IMPLEMENTED FOR PROTECTION OF EXISTING ON-SITE AND OFF-SITE VEGETATION.
6. PROPOSED PLANTING SHALL BE PROVIDED IN COMPLIANCE WITH LANDSCAPE GUIDELINES OF THE CITY OF ALEXANDRIA.
7. SPECIFICATION FOR ALL PLANTINGS SHALL BE IN ACCORDANCE WITH THE CURRENT AND MOST UP TO DATE EDITION OF ANSI-Z60.1, THE AMERICAN STANDARD FOR NURSERY STOCK AS PRODUCED BY THE AMERICAN ASSOCIATION OF NURSERYMEN; WASHINGTON, D.C.
8. IN LIEU OF MORE STRENUOUS SPECIFICATIONS, ALL LANDSCAPE RELATED WORK SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE CURRENT AND MOST UP-TO-DATE EDITION (AT TIME OF CONSTRUCTION) OF LANDSCAPE SPECIFICATION GUIDELINES AS PRODUCED BY THE LANDSCAPE CONTRACTORS ASSOCIATION OF MARYLAND, DISTRICT OF COLUMBIA AND VIRGINIA; GAITHERSBURG, MARYLAND.
9. PRIOR TO COMMENCEMENT OF LANDSCAPE INSTALLATION/PLANTING OPERATIONS, A PRE-INSTALLATION/CONSTRUCTION MEETING WILL BE SCHEDULED WITH THE CITY'S ARBORIST AND LANDSCAPE ARCHITECTS TO REVIEW THE SCOPE OF INSTALLATION PROCEDURES AND PROCESSES.
10. AS-BUILT DRAWINGS FOR THIS LANDSCAPE PLAN AND/OR IRRIGATION/WATER MANAGEMENT SYSTEM WILL BE PROVIDED IN COMPLIANCE WITH CITY OF ALEXANDRIA LANDSCAPE GUIDELINES. AS-BUILT DRAWINGS SHALL INCLUDE CLEAR IDENTIFICATION OF ALL VARIATION(S) AND CHANGES FROM APPROVED DRAWINGS INCLUDING LOCATION, QUANTITY AND SPECIFICATION OF ALL PROJECT ELEMENTS.

THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS SET FORTH BY THE CITY OF ALEXANDRIA, DEPARTMENT OF ARCHEOLOGY, AS OUTLINED IN THE APRIL 17, 2015 LETTER APPENDED TO THE SPECIFICATIONS. THE REQUIREMENTS INCLUDE:

1. ALL REQUIRED ARCHAEOLOGICAL PRESERVATION MEASURES SHALL BE COMPLETED PRIOR TO GROUND-DISTURBING ACTIVITIES (SUCH AS CORING, GRADING, FILLING, VEGETATION REMOVAL, UNDERGROUND UTILITIES, PILE DRIVING, LANDSCAPING AND OTHER EXCAVATIONS AS DEFINED IN SECTION 2-151 OF THE ZONING ORDINANCE) OR A RESOURCE MANAGEMENT PLAN MUST BE IN PLACE TO PRESERVE AND/OR RECOVER SIGNIFICANT RESOURCES IN CONCERT WITH CONSTRUCTION ACTIVITIES. TO CONFIRM, CALL ALEXANDRIA ARCHAEOLOGY AT (703) 838-4399.
2. CALL ALEXANDRIA ARCHAEOLOGY (703/838-4399) TWO WEEKS BEFORE THE STARTING DATE OF ANY GROUND DISTURBANCE SO THAT AN INSPECTION OR MONITORING SCHEDULE FOR CITY ARCHAEOLOGISTS CAN BE ARRANGED. (THE SUBMITTING ENGINEER MUST CONFIRM WITH ALEXANDRIA ARCHAEOLOGY AT (703) 838-4399 BEFORE INCLUDING THIS NOTE ON THE PLAN)
3. THE APPLICANT SHALL CALL ALEXANDRIA ARCHAEOLOGY IMMEDIATELY (703-838-4399) IF ANY BURIED STRUCTURAL REMAINS (WALL FOUNDATIONS, WELLS, PRIVIES, CISTERNS, ETC.) OR CONCENTRATIONS OF ARTIFACTS ARE DISCOVERED DURING DEVELOPMENT. WORK MUST CEASE IN THE AREA OF THE DISCOVERY UNTIL A CITY ARCHAEOLOGIST COMES TO THE SITE AND RECORDS THE FINDS.
  - THE PROJECT ARCHAEOLOGIST SHALL IMMEDIATELY NOTIFY NPS AND ALEXANDRIA ARCHAEOLOGY. THE PROJECT ARCHAEOLOGIST SHALL INSPECT THE RECOVERED MATERIAL TO DETERMINE THE EXTENT OF THE DISCOVERY AND PROVIDE RECOMMENDATIONS REGARDING ITS NATIONAL REGISTER ELIGIBILITY AND TREATMENT TO NPS.
  - NPS SHALL PROVIDE SHPO, ALEXANDRIA ARCHAEOLOGY, AND THE CORPS WITH ITS ASSESSMENT OF THE ELIGIBILITY AND THE MEASURES IT PROPOSES TO ADDRESS THE DISCOVERY FOR COMMENT. SHPO, ALEXANDRIA ARCHAEOLOGY AND THE CORPS SHALL RESPOND WITHIN TWO BUSINESS DAY OF RECEIPT. IF ANY PARTY FAILS TO RESPOND WITHIN TWO BUSINESS DAYS, THE NATIONAL PARK SERVICE MAY ASSUME THAT PARTY HAS NO COMMENTS.
  - NPS SHALL TAKE INTO ACCOUNT THE CONSULTING PARTIES' RECOMMENDATIONS ON ELIGIBILITY AND TREATMENT OF THE DISCOVERY AND SHALL ENSURE THAT APPROPRIATE ACTIONS ARE CARRIED OUT AND PROVIDE SHPO, ALEXANDRIA ARCHAEOLOGY, AND THE CORPS WITH A REPORT ON THESE ACTIONS WHEN THEY HAVE BEEN IMPLEMENTED.
  - REMEDIATION ACTIVITIES MAY PROCEED, IN THE AREA OF THE DISCOVERY, WHEN THE NPS HAS DETERMINED THAT IMPLEMENTATION OF THE ACTIONS UNDERTAKEN TO ADDRESS THE DISCOVERY ARE COMPLETE.
4. THE APPLICANT SHALL NOT ALLOW ANY METAL DETECTION AND/OR ARTIFACT COLLECTION TO BE CONDUCTED ON THE PROPERTY, UNLESS AUTHORIZED BY ALEXANDRIA ARCHAEOLOGY. FAILURE TO COMPLY SHALL RESULT IN PROJECT DELAYS.

NATIONAL PARK SERVICE (NPS) SEAN McCABE 1100 OHIO DRIVE, SW WASHINGTON, DC 20242 202-619-7276	ALEXANDRIA ARCHAEOLOGY FRANCINE BROMBERG 220 N. WASHINGTON ST. ALEXANDRIA, VA 22314 703-746-4399
VIRGINIA'S STATE HISTORIC NORFOLK PRESERVATION OFFICE (SHPO) ETHEL R. EATON, PH.D. 2801 KENSINGTON AVENUE RICHMOND, VA 23221 804-482-6088	NORTHERN VIRGINIA FIELD OFFICE OF THE  DISTRICT CORPS OF ENGINEERS (CORPS) THERESITA CROCKETT-AUGUSTINE 18139 TRIANGLE PLAZA, SUITE 213 DUMFRIES, VA 22026 703-221-9736

1. AT WEST POINT PARK, STREET LIGHTS, REPLACEMENT PLANT MATERIALS, AND A NEW OBSERVATION PLATFORM WILL BE DESIGNED AND CONSTRUCTED UNDER SEPARATE CONTACT.
2. DETAILED NOTES AND DESCRIPTIONS ARE PRESENTED IN THE SPECIFICATIONS DOCUMENT THAT HAS BEEN PREPARED TO ACCOMPANY THIS PLAN SET. THE NOTES PRESENTED HEREIN ARE NOT COMPREHENSIVE AND DO NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR READING AND UNDERSTANDING THE SPECIFICATIONS DOCUMENT.
3. THE CONTRACTOR IS ADVISED THAT COAL-TAR RELATED CONSTITUENTS ARE PRESENT IN SOIL AND GROUND WATER FROM A FORMER MANUFACTURED GAS PLANT. THE CONTRACTOR SHALL PREPARE A SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP) THAT DESCRIBES APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT, TRAINING AND WORK PROCEDURES TO BE REQUIRED FOR ON-SITE PERSONNEL. THE HASP SHALL BE SUBMITTED TO THE CITY PRIOR TO THE INITIATION OF ANY SITE DISTURBANCE ACTIVITIES.
4. INFORMATION ON SOILS AND GROUND WATER CONDITIONS ARE SUMMARIZED IN THE GEI REMEDIAL ACTION PLAN DATED AUGUST, 2016 AND FEBRUARY 4, 2015 GEOTECHNICAL STUDY REPORT. COPIES OF THESE REPORTS ARE APPENDED TO THE CONTRACT DOCUMENT.
5. REASONABLE CARE HAS BEEN USED TO ASSURE THAT THE INFORMATION PRESENTED FOR THIS PROJECT REFLECTS ACTUAL SITE CONDITIONS; HOWEVER THE USE OF THESE DATA BY THE CONTRACTOR IS AT HIS OWN RISK. THE CONTRACTOR IS EXPECTED TO PRACTICE INDEPENDENT DUE DILIGENCE PRIOR TO BEGINNING WORK ON THIS PROJECT. NO WARRANTY OR ASSURANCE IS EXPRESSED OR IMPLIED.
6. THE PERFORMANCE OF PROJECT WORK FROM THE WATER OR SEA SIDE IS PREFERRED. THE PROJECT LIMITS ALLOWS FOR SOME SHORE SIDE ACTIVITIES, SUCH DEWATERING EFFLUENT TREATMENT, MATERIALS STAGING/STORAGE, AND LIMITED SHORE SIDE ACCESS FOR DEMOLITION AND DREDGING/CAP CONSTRUCTION SUPPORT.
7. THE CONTRACTOR SHALL MAKE ALL EFFORT TO PROTECT CITY PROPERTY FROM PROJECT ACTIVITIES, INCLUDING TREES, SIDEWALKS, LANDSCAPING, LAWNS, CURBING AND PAVEMENT, AS NOTED IN THE PLANS. ANY DAMAGED PROPERTY WILL BE DOCUMENTED AND REPAIRED ACCORDING TO CITY STANDARDS PRIOR TO FINAL ACCEPTANCE OF WORK AT CONTRACTOR'S EXPENSE.
8. THE UTILITIES ARE SHOWN ON SHEET C01 FOR INFORMATIONAL/PLANNING PURPOSES ONLY. LOCATIONS MAY BE APPROXIMATE AND/OR INCOMPLETE. THE INFORMATION PRESENTED SHALL NOT RELIEVE THE CONTRACTOR OF HIS OBLIGATION TO LOCATE UTILITIES PRIOR TO INITIATING CONSTRUCTION ACTIVITIES.
9. FLOATING WOODY DEBRIS PRESENT IN THE DREDGING AREA AND/OR UNDER ROBINSON TERMINAL PIER CAN ADVERSELY AFFECT PROJECT WORK. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF WOODY DEBRIS IN THE PROJECT AREA.
10. DREDGING SHALL BE CONDUCTED TO ACHIEVE THE TARGET ELEVATION, WITH NO MORE THAN 6" OF OVERDREDGING ALLOWED UNDER THIS CONTRACT. EXCESS OVERDREDGING AND MATERIAL DISPOSAL QUANTITIES/COSTS ARE NON-PAY ITEMS. A BATHYMETRIC SURVEY SHALL BE CONDUCTED TO CONFIRM THAT THE TARGET ELEVATION HAS BEEN ACHIEVED WITHIN THE ALLOWED OVERDREDGING LIMITS.
11. THE CONTRACTOR SHALL COLLECT ALL EXCAVATED SOIL/DEMOLITION MATERIAL FOR DISPOSAL IN A PROPER MANNER.
12. FOR ARMORING MATERIALS, THE VISUAL CONFIRMATION OF PLACEMENT THICKNESS WILL BE ACCEPTABLE SO LONG AS THE MATERIALS ARE PLACED UNDER THE DIRECT OBSERVATION BY A DESIGNATED CITY REPRESENTATIVE. OTHERWISE, THICKNESS MEASUREMENTS WILL BE REQUIRED.
13. REPLACEMENT MATERIALS ARE TO BE KEYED TO THE SHORELINE AND PIER APRON BORDERS AS SHOWN IN THE PLANS.
14. THE EXISTING BOOMS ARE TO BE REMOVED FOR PROPER DISPOSAL. THE MARINE ANCHORS ARE TO BE RELOCATED AND REUSED AS SHOWN IN THE DRAWINGS.

1. INSTALL PERIMETER EROSION AND SEDIMENT CONTROLS AS SHOWN ON THIS PLAN.
2. INSTALL INLET PROTECTION AT EXISTING STORM DRAIN INLETS SHOWN ON THIS PLAN.
3. CONDUCT DEMOLITION AND CONSTRUCTION ACTIVITIES ACCORDING TO THE APPLICABLE PLANS.
4. INSTALL ADDITIONAL EROSION AND SEDIMENT CONTROL PRACTICES AS NECESSARY AND AS DIRECTED BY THE EROSION AND SEDIMENT CONTROL INSPECTOR.
5. UPON COMPLETION OF DEMOLITION, CONSTRUCTION AND LAND DISTURBING ACTIVITIES AND WITH THE APPROVAL OF THE EROSION AND SEDIMENT CONTROL INSPECTOR; REMOVE ALL REMAINING EROSION AND SEDIMENT CONTROL PRACTICES AND PROVIDE PERMANENT STABILIZATION ACCORDING TO APPROVED METHODS.
6. CONSTRUCTION DEBRIS MUST BE REMOVED TO AN APPROVED LANDFILL WITH ADEQUATE FREQUENCY IN ACCORDANCE WITH THE VIRGINIA STATE LITTER CONTROL ACT.

# ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION



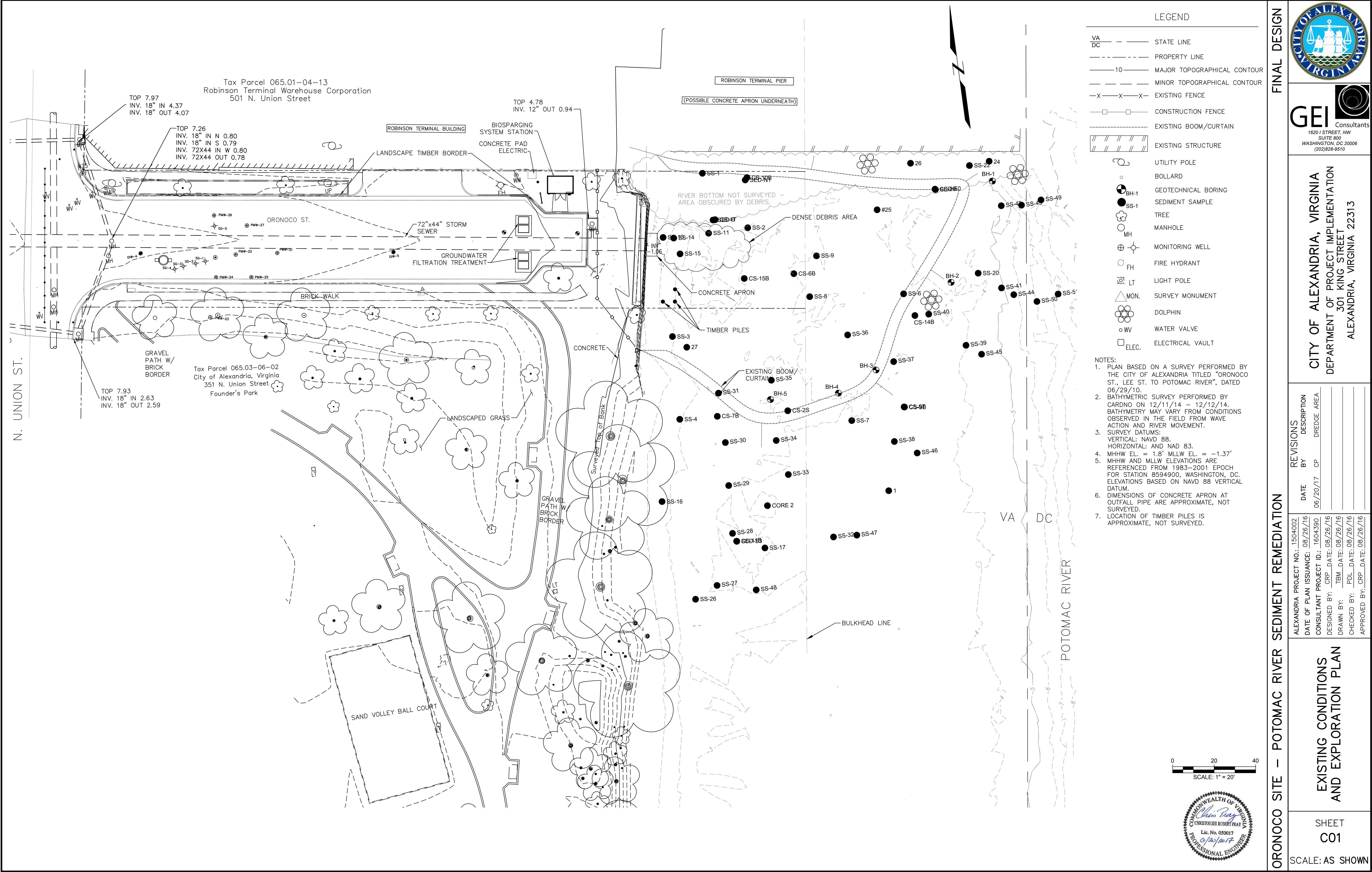
CITY OF ALEXANDRIA, VIRGINIA  
DEPARTMENT OF PROJECT IMPLEMENTATION  
301 KING STREET  
ALEXANDRIA, VIRGINIA 22313

REVISONS	
DATE	BY DESCRIPTION
06/20/17	CP DREDGE AREA


## NOTES

SHEET  
G01

SCALE: AS SHOWN



FINAL DESIGN



GEI Consultants  
1620 I STREET, NW  
SUITE 800  
WASHINGTON, DC 20006  
(202)828-9510

CITY OF ALEXANDRIA, VIRGINIA  
DEPARTMENT OF PROJECT IMPLEMENTATION  
301 KING STREET  
ALEXANDRIA, VIRGINIA 22313

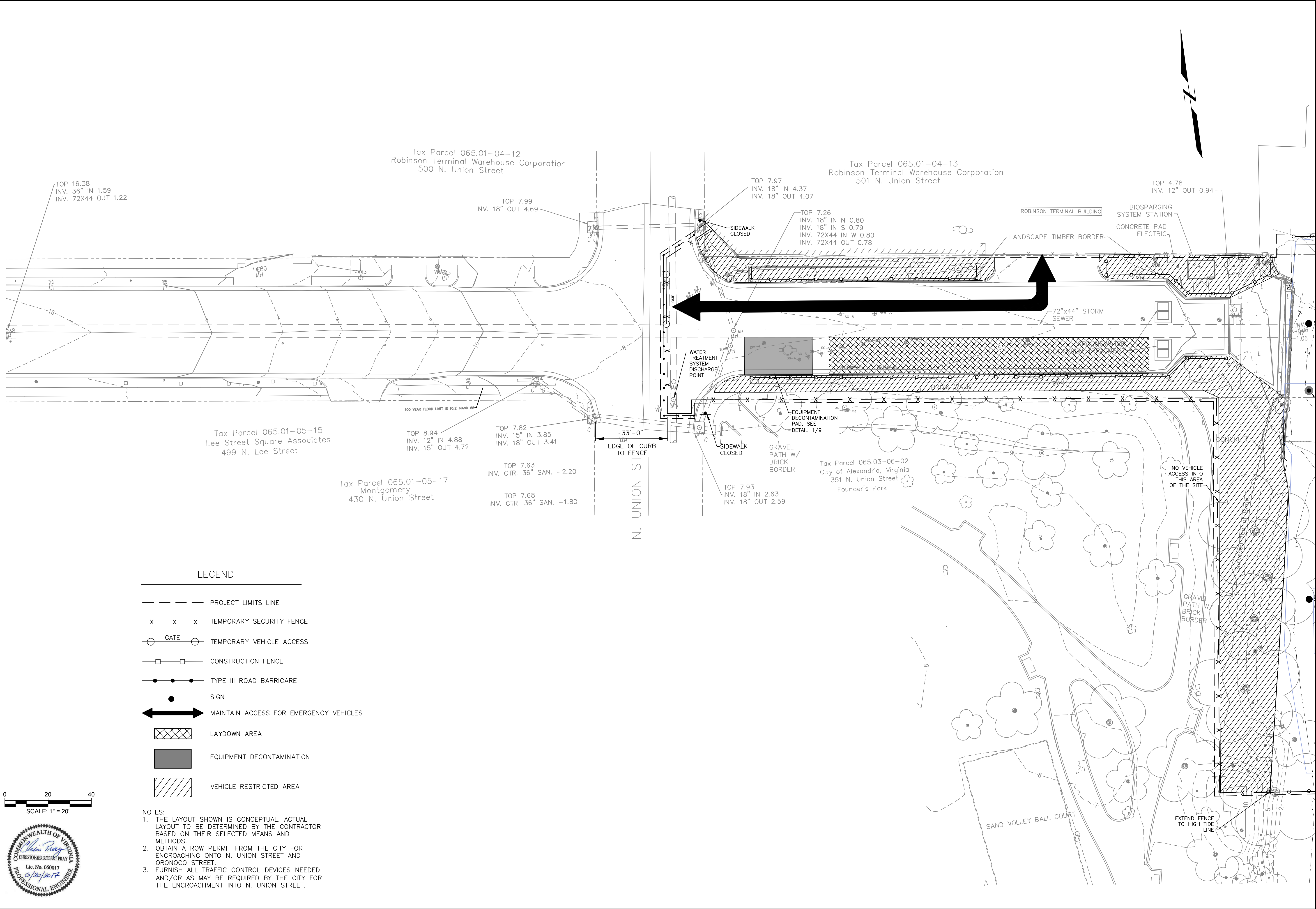
REVISONS	
DATE	DESCRIPTION
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ALEXANDRIA PROJECT NO.: 1504002  
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EXISTING CONDITIONS  
AND EXPLORATION PLAN

SHEET  
C01

SCALE: AS SHOWN



FINAL DESIGN



GEI Consultants

1620 I STREET, NW  
SUITE 800  
WASHINGTON, DC 20006  
(202)828-9510

CITY OF ALEXANDRIA, VIRGINIA

DEPARTMENT OF PROJECT IMPLEMENTATION

301 KING STREET

ALEXANDRIA, VIRGINIA 22313

REVISIONS	
DATE	DESCRIPTION
06/20/17	CP DREDGE AREA
08/18/17	CP REMOVED STOCKPILE

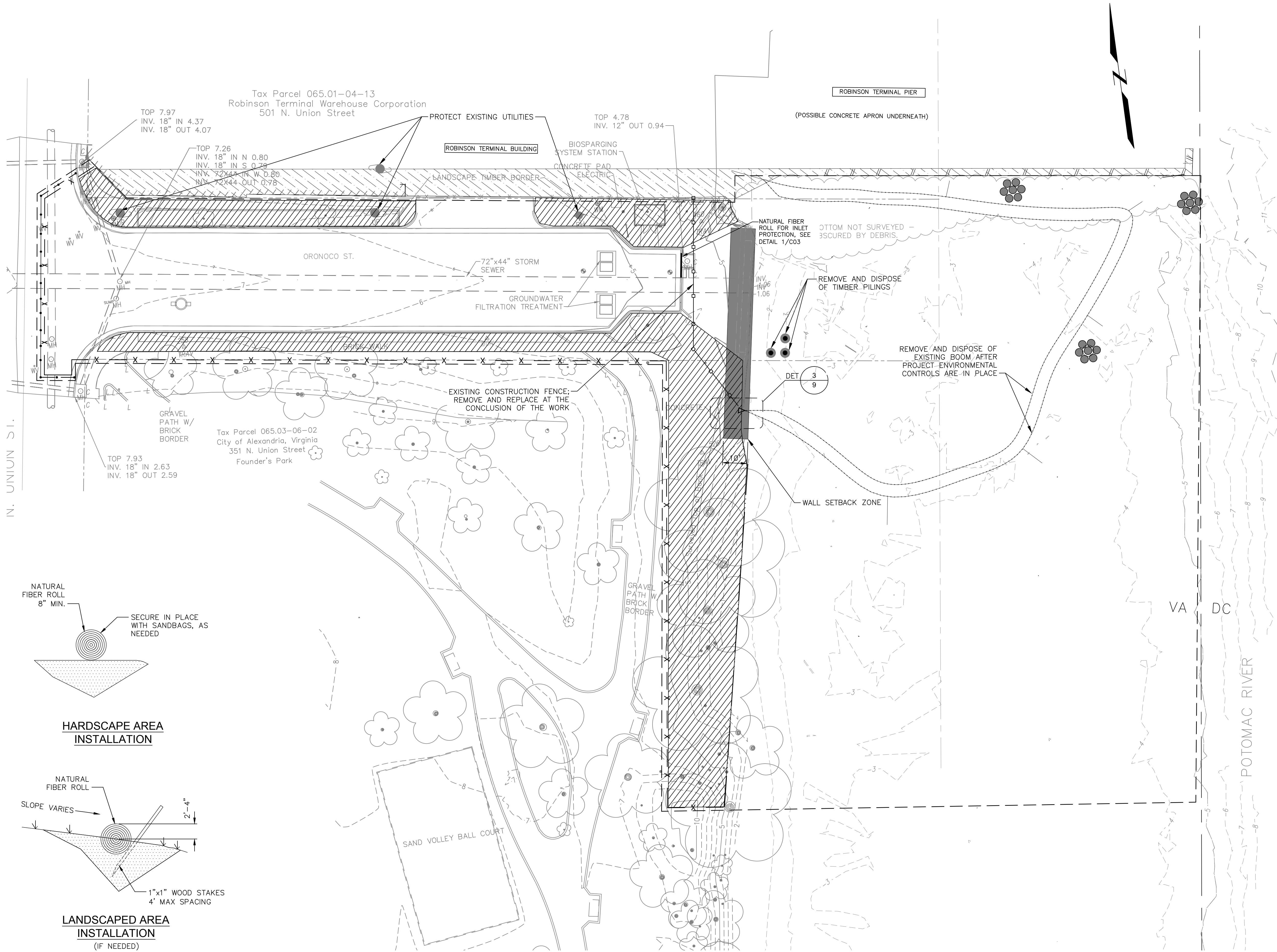
ALEXANDRIA PROJECT NO.: 1504002
DATE OF PLAN ISSUANCE: 08/26/16
CONSULTANT PROJECT ID.: 1604390
DESIGNED BY: CRP DATE: 08/26/16
DRAWN BY: TBM DATE: 08/26/16
CHECKED BY: PDL DATE: 08/26/16
APPROVED BY: CRP DATE: 08/26/16

ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION

ONSHORE SITE  
MANAGEMENT PLAN

SHEET  
C02

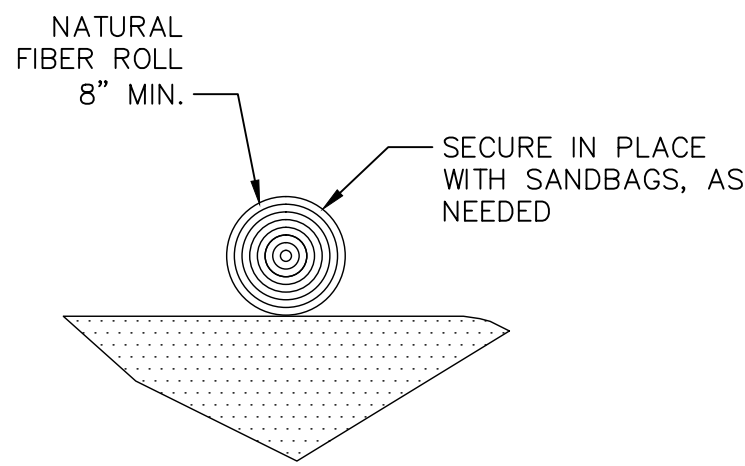
SCALE: AS SHOWN



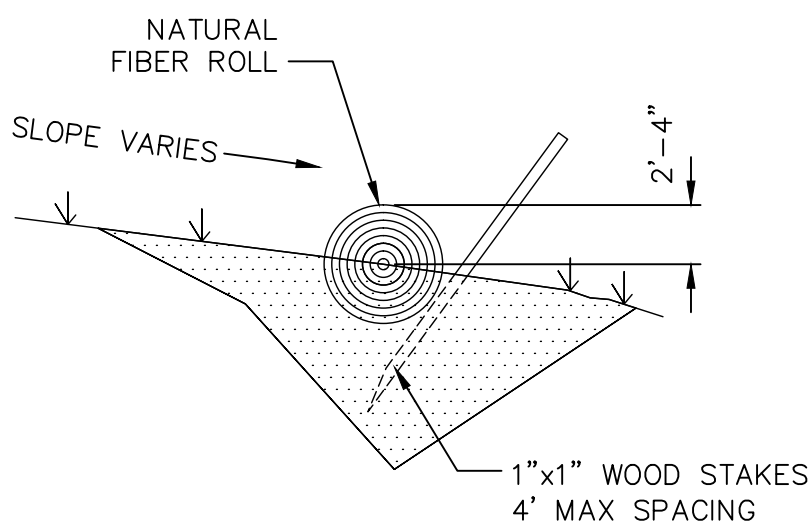
LEGEND

- PROJECT LIMITS
- CONSTRUCTION FENCE
- DEMOLISH TIMBER PILES
- PROTECT STRUCTURE
- PROTECT MOORING DOLPHINS
- WALL SETBACK ZONE
- PROTECT EXISTING UTILITIES
- VEHICLE RESTRICTED AREA

- NOTES:
- CUT TIMBER PILES OFF AT MUDLINE AND DISPOSE OF OFF SITE.
  - REMOVE AND SALVAGE EXISTING ANCHOR POINT, REFER TO DETAIL 3/9.
  - PROTECT ALL TREES WITHIN THE LIMITS OF WORK.
  - DO NOT PLACE ANY STOCKPILES OR MACHINERY WITHIN THE WALL SETBACK ZONE.
  - ANY DAMAGED TREES MUST BE REPLACED WITH A TREE SPECIES/CALIPER SIZE THAT IS ACCEPTABLE TO THE CITY.

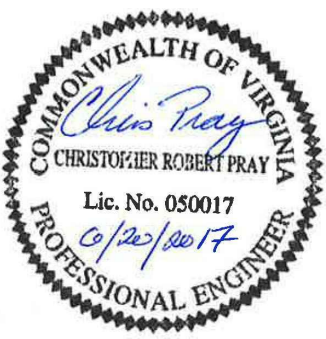


HARDSCAPE AREA INSTALLATION



LANDSCAPED AREA INSTALLATION (IF NEEDED)

1 C03 DETAIL - NATURAL FIBER ROLLS SCALE: N.T.S.



FINAL DESIGN

ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION

CITY OF ALEXANDRIA, VIRGINIA  
DEPARTMENT OF PROJECT IMPLEMENTATION  
301 KING STREET  
ALEXANDRIA, VIRGINIA 22313

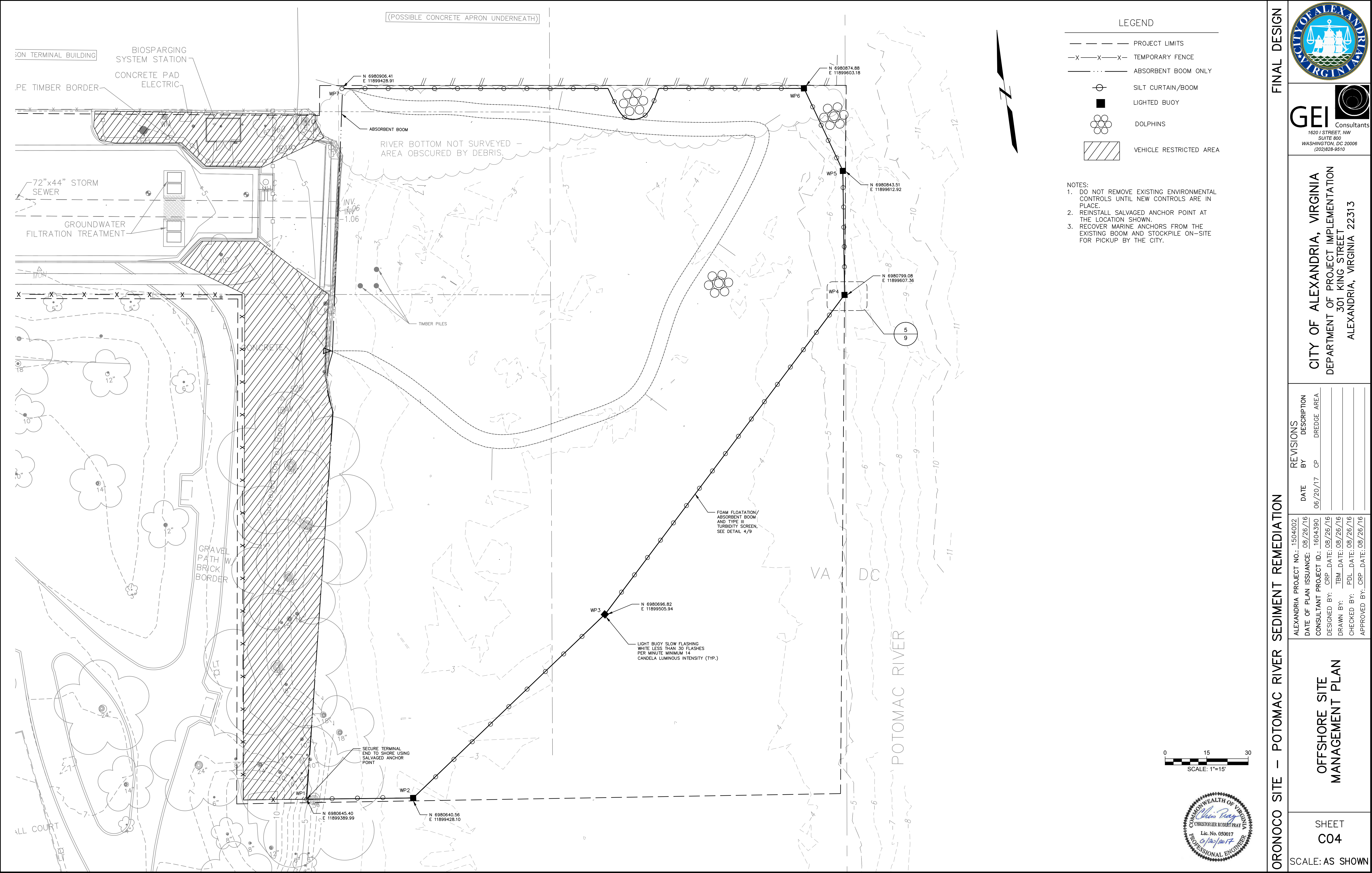
REVISONS	DATE	BY	DESCRIPTION
	08/20/17	CP	DREDGE AREA

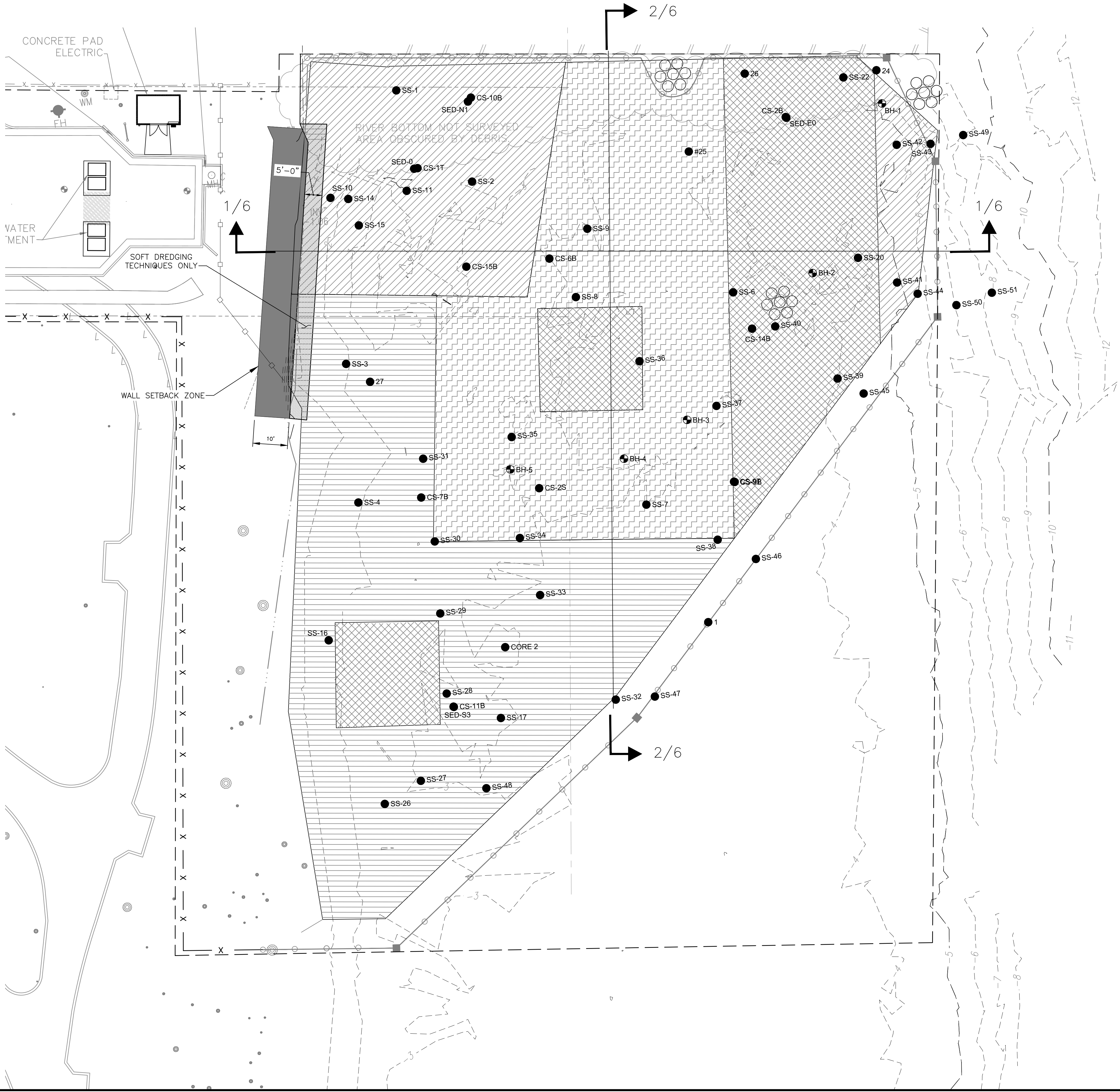
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APPROVED BY: CRP DATE: 08/26/16	APPROVED BY: CRP DATE: 08/26/16

DEMOLITION AND EROSION AND SEDIMENT CONTROL PLAN

SHEET C03

SCALE: AS SHOWN





LEGEND

PROJECT LIMITS LINE

TURBIDITY CURTAIN/BOOM

BOOM ONLY

DREDGE TO ELEVATION - 7.0 FT

DREDGE TO ELEVATION - 6.0 FT

DREDGE TO ELEVATION - 5.0 FT

DREDGE TO ELEVATION - 4.0 FT

SOFT DREDGE TECHNIQUES ONLY TO ELEVATION -2.0 FT

SETBACK ZONE

- NOTES:
1. MAINTAIN DREDGING OFFSETS AS SHOWN IN THE PLAN.
  2. DO NOT BEGIN DREDGING UNTIL ALL ENVIRONMENTAL CONTROLS ARE IN PLACE AND HAVE BEEN ACCEPTED BY THE OWNER'S REPRESENTATIVE.
  3. ONLY PERFORM DREDGING WORK WHEN FAVORABLE WEATHER CONDITIONS ARE FORECASTED.
  4. IF USED, THE CHANNEL CUT IN MUST FOLLOW THE ALIGNMENT SHOWN. THE FINAL WIDTH, LENGTH AND DEPTH OF THE CUT IN WILL VARY DEPENDING ON THE EQUIPMENT SELECTED BY THE CONTRACTOR.
  5. REMOVE AND DISPOSE OF ALL DEBRIS WITHIN THE DREDGING AREAS AS NEEDED TO COMPLETE THE WORK.
  6. KEEP ADDITIONAL ABSORBENT BOOM ON HAND, READY FOR RAPID DEPLOYMENT, TO RECOVER SHEEN/FLOATING PRODUCT IN THE VICINITY OF ACTIVE DREDGING.
  7. THE OWNER'S REPRESENTATIVE MAY DIRECT THAT ADDITIONAL MATERIAL BE REMOVED BASED ON OBSERVED CONDITIONS IN THE FIELD.
  8. DREDGE SPOILS BEING TRANSFERRED TO A BARGE MUST BE PERFORMED WITHIN THE ENVIRONMENTAL CONTROLS.
  9. DEPTHS OF THE SOFT TECHNIQUES DREDGE AREA ARE TO MIRROR THE DEPTH OF THE CORRESPONDING ADJACENT DREDGE ZONE.
  10. REMOVE SEDIMENTS IN THE SOFT DREDGING ZONE VIA NON-MECHANICAL METHODS (E.G. VAC TRUCK, HAND TOOLS, ETC.).



FINAL DESIGN

ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION

CITY OF ALEXANDRIA, VIRGINIA

DEPARTMENT OF PROJECT IMPLEMENTATION

301 KING STREET

ALEXANDRIA, VIRGINIA 22313

GEI Consultants

1620 I STREET, NW

SUITE 800

WASHINGTON, DC 20006

(202)828-9510

REVISIONS

DATE	BY	DESCRIPTION
06/20/17	CP	DREDGE AREA

ALEXANDRIA PROJECT NO.: 1504002

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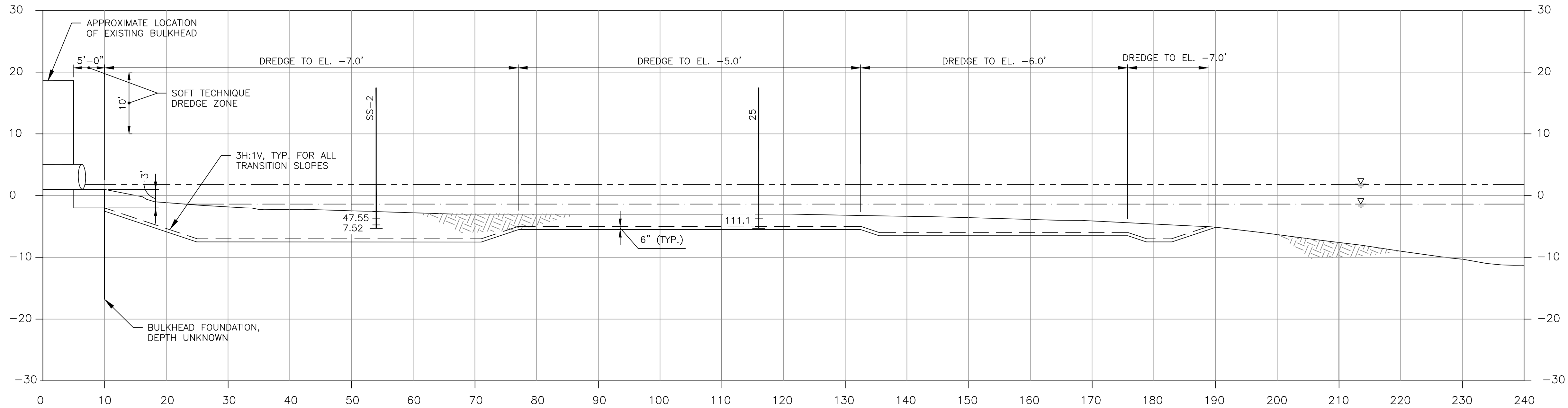
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APPROVED BY: CRP DATE: 08/26/16

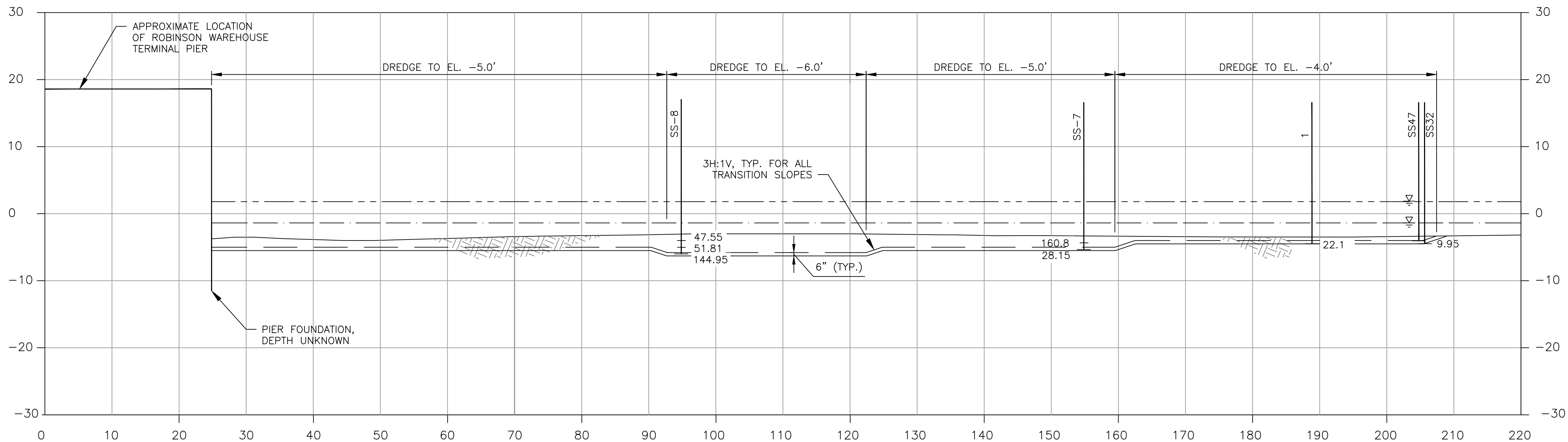
DREDGING PLAN

SHEET C05

SCALE: AS SHOWN



1 SECTION A  
5 1" = 10'-0"

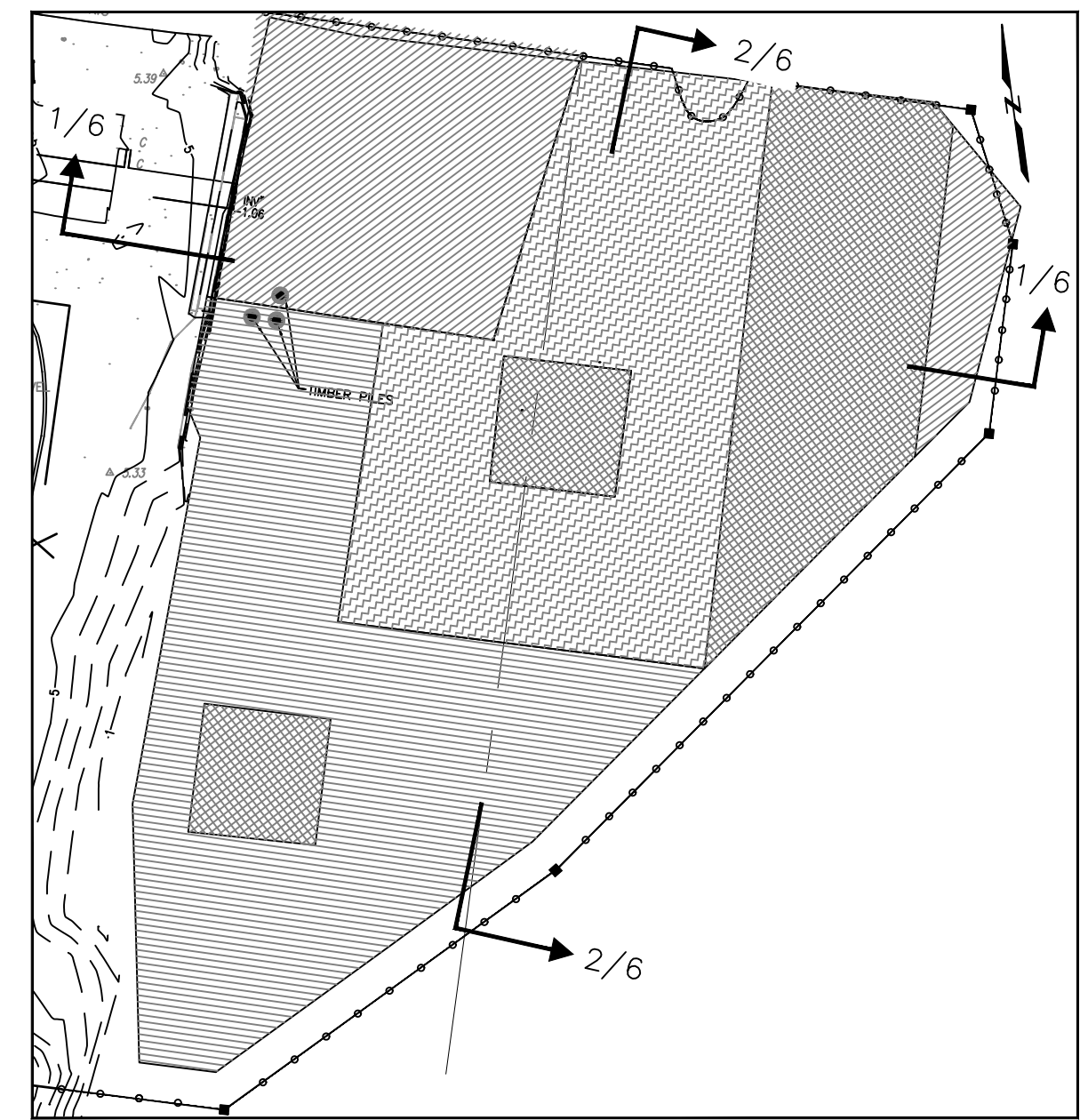


2 SECTION B  
5 1" = 10'-0"

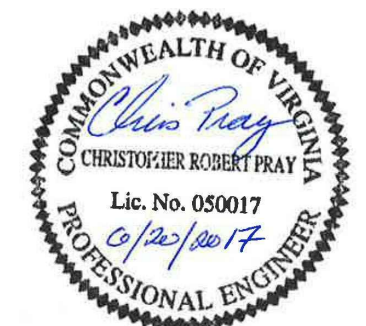
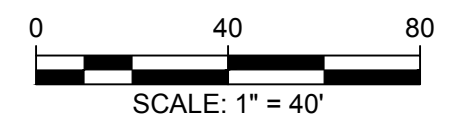


NOTE:  
1. MHHW AND MLLW ELEVATIONS ARE REFERENCED ON 1983-2001 EPOCH  
FOR STATION 8594900, WASHINGTON DC. ELEVATIONS BASED ON NAVD88  
VERTICAL DATUM.

- LEGEND
- MEAN HIGHER HIGH WATER (MHHW)
  - MEAN LOWER LOW WATER (MLLW)
  - EXISTING SEDIMENT SURFACE
  - DREDGE LIMITS
  - OVER DREDGE LIMITS
  - SAMPLE LOCATION
  - PAH SAMPLE RESULTS (MG/KG)
  - BOTTOM OF SAMPLE



KEY PLAN  
SCALE: 1" = 40'-0"



FINAL DESIGN



CITY OF ALEXANDRIA, VIRGINIA  
DEPARTMENT OF PROJECT IMPLEMENTATION  
301 KING STREET  
ALEXANDRIA, VIRGINIA 22313

ORONOCO SITE - POTOMAC RIVER SEDIMENT REMEDIATION

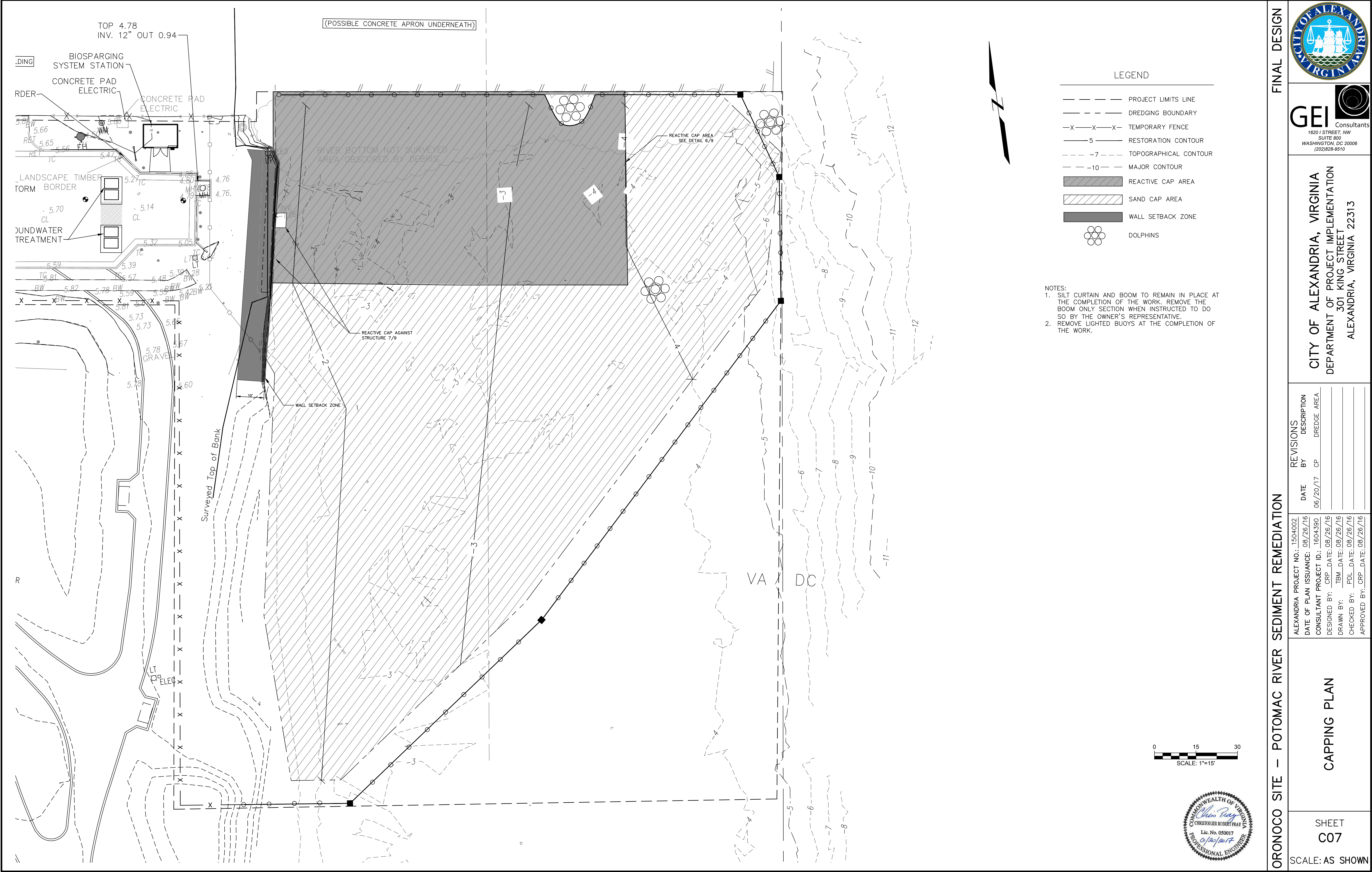
REVISIONS		DATE	BY	DESCRIPTION
		06/20/17	CP	DREDGE AREA

ALEXANDRIA PROJECT NO.: 1504002  
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APPROVED BY: CRP DATE: 08/26/16

DREDGING  
CROSS SECTIONS

SHEET  
C06

SCALE: AS SHOWN



LEGEND

---

PROJECT LIMITS LINE

---

DREDGING BOUNDARY

-X-X-X-

TEMPORARY FENCE

---

RESTORATION CONTOUR

---

TOPOGRAPHICAL CONTOUR

---

MAJOR CONTOUR

REACTIVE CAP AREA

SAND CAP AREA

WALL SETBACK ZONE

DOLPHINS

NOTES:  
1. SILT CURTAIN AND BOOM TO REMAIN IN PLACE AT THE COMPLETION OF THE WORK. REMOVE THE BOOM ONLY SECTION WHEN INSTRUCTED TO DO SO BY THE OWNER'S REPRESENTATIVE.  
2. REMOVE LIGHTED BUOYS AT THE COMPLETION OF THE WORK.

FINAL DESIGN

CITY OF ALEXANDRIA, VIRGINIA

DEPARTMENT OF PROJECT IMPLEMENTATION

301 KING STREET

ALEXANDRIA, VIRGINIA 22313

GEI

Consultants

1620 I STREET, NW

SUITE 800

WASHINGTON, DC 20006

(202)828-9510

ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION

CAPPING PLAN

SHEET  
C07

SCALE: AS SHOWN

REVISIONS	DATE	BY	DESCRIPTION
	06/20/17	CP	DREDGE AREA

ALEXANDRIA PROJECT NO.: 1504002

DATE OF PLAN ISSUANCE: 08/26/16

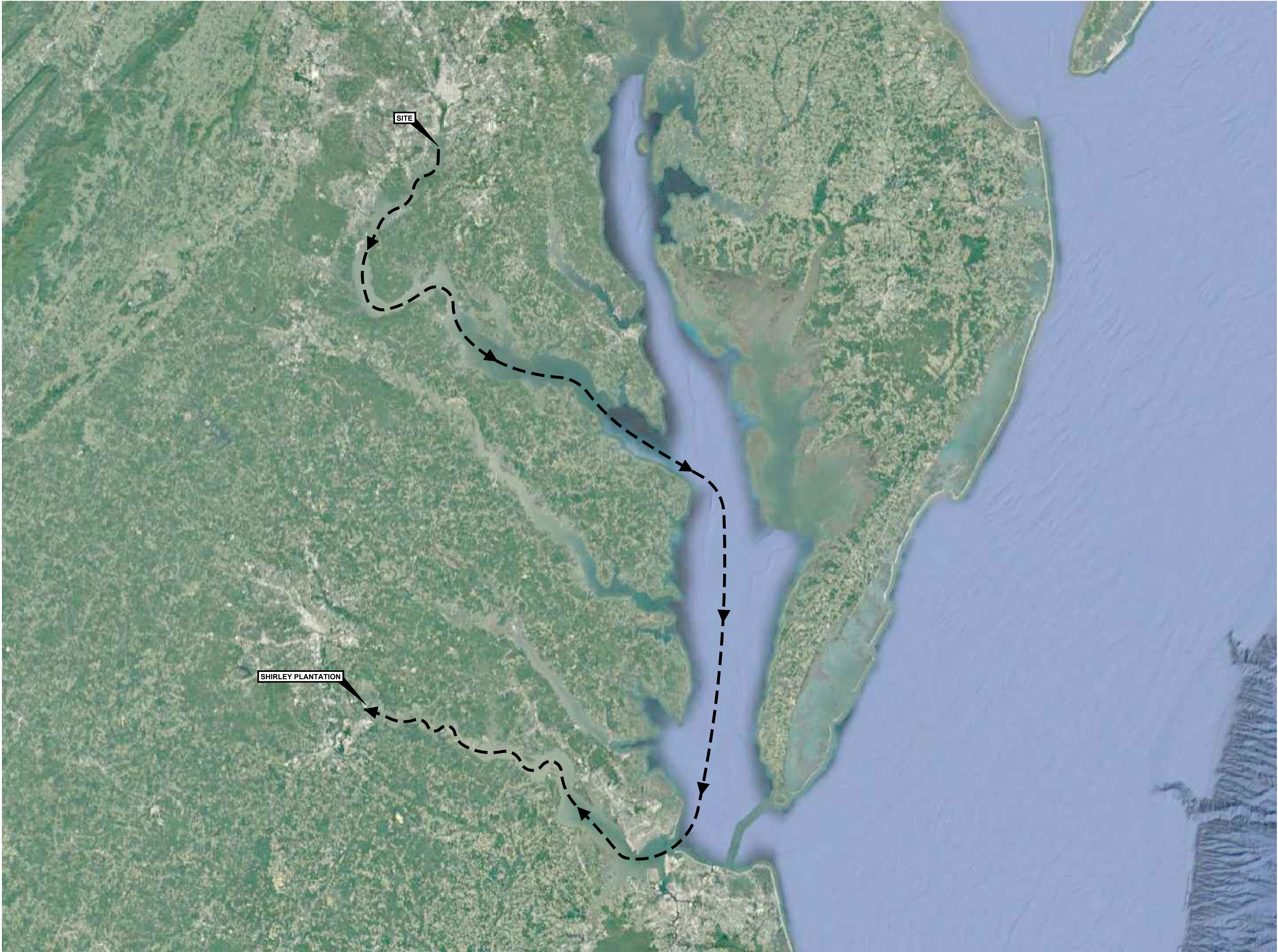
CONSULTANT PROJECT ID.: 1604390

DESIGNED BY: CRP DATE: 08/26/16

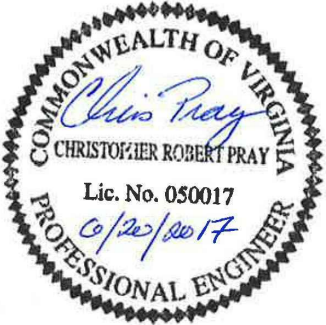
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CHECKED BY: PDL DATE: 08/26/16

APPROVED BY: CRP DATE: 08/26/16



NOT TO SCALE



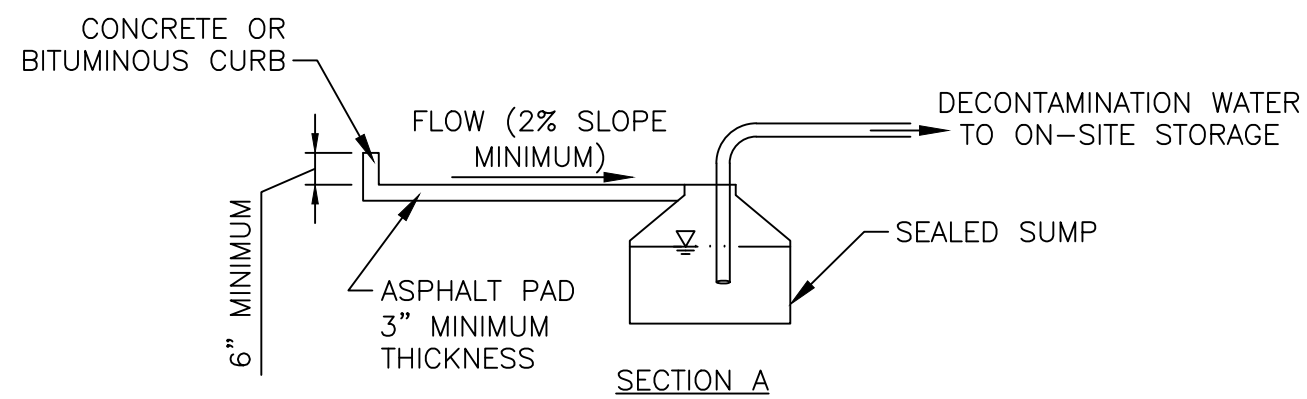
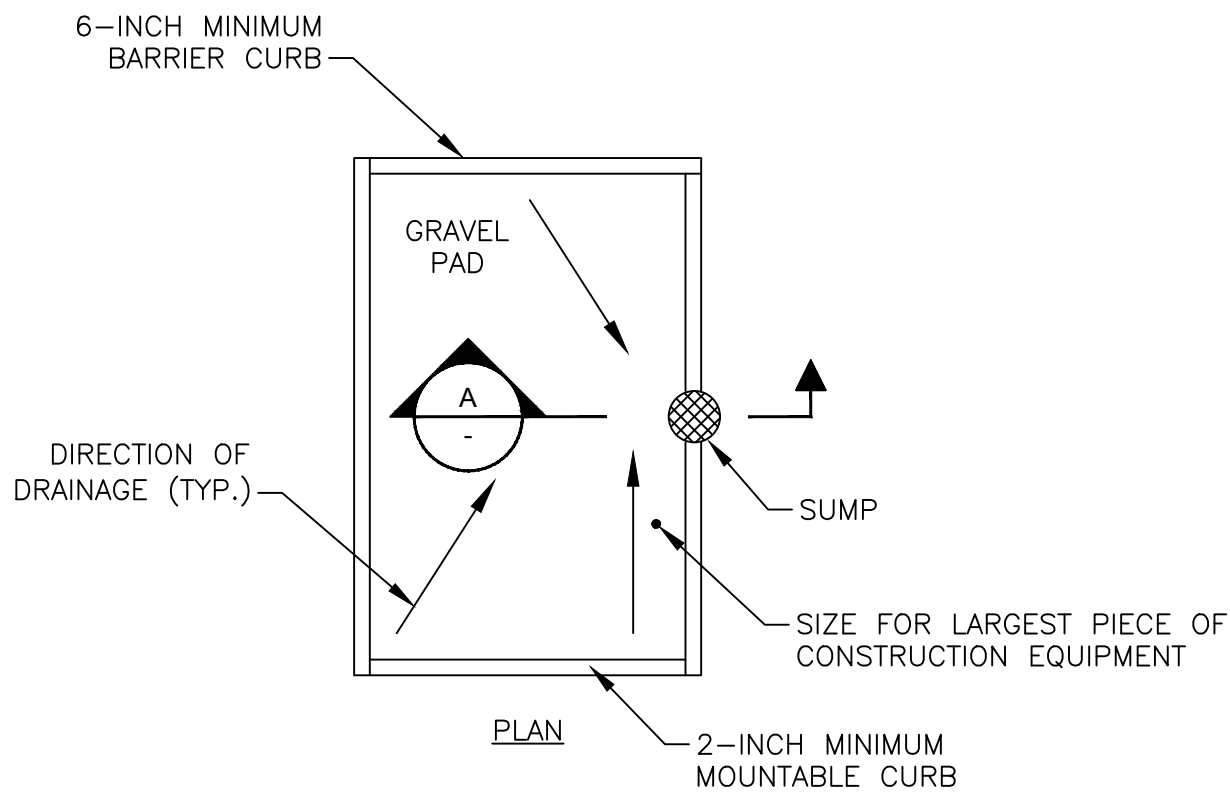
NOTE:  
1. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION NEEDED TO MOVE SEDIMENTS VIA WATER (E.G. BRIDGE OPENINGS).

← - - - → BARGE ROUTE

LEGEND

NOT FOR NAVIGATION

REVISIONS		DESCRIPTION	
DATE	BY	CP	DREDGE AREA
08/20/17			



DECONTAMINATION NOTES:  
1. ALL VEHICLES EXITING EXCLUSION ZONE MUST CONTROL OVERSPRAY.

### EQUIPMENT DECONTAMINATION PAD

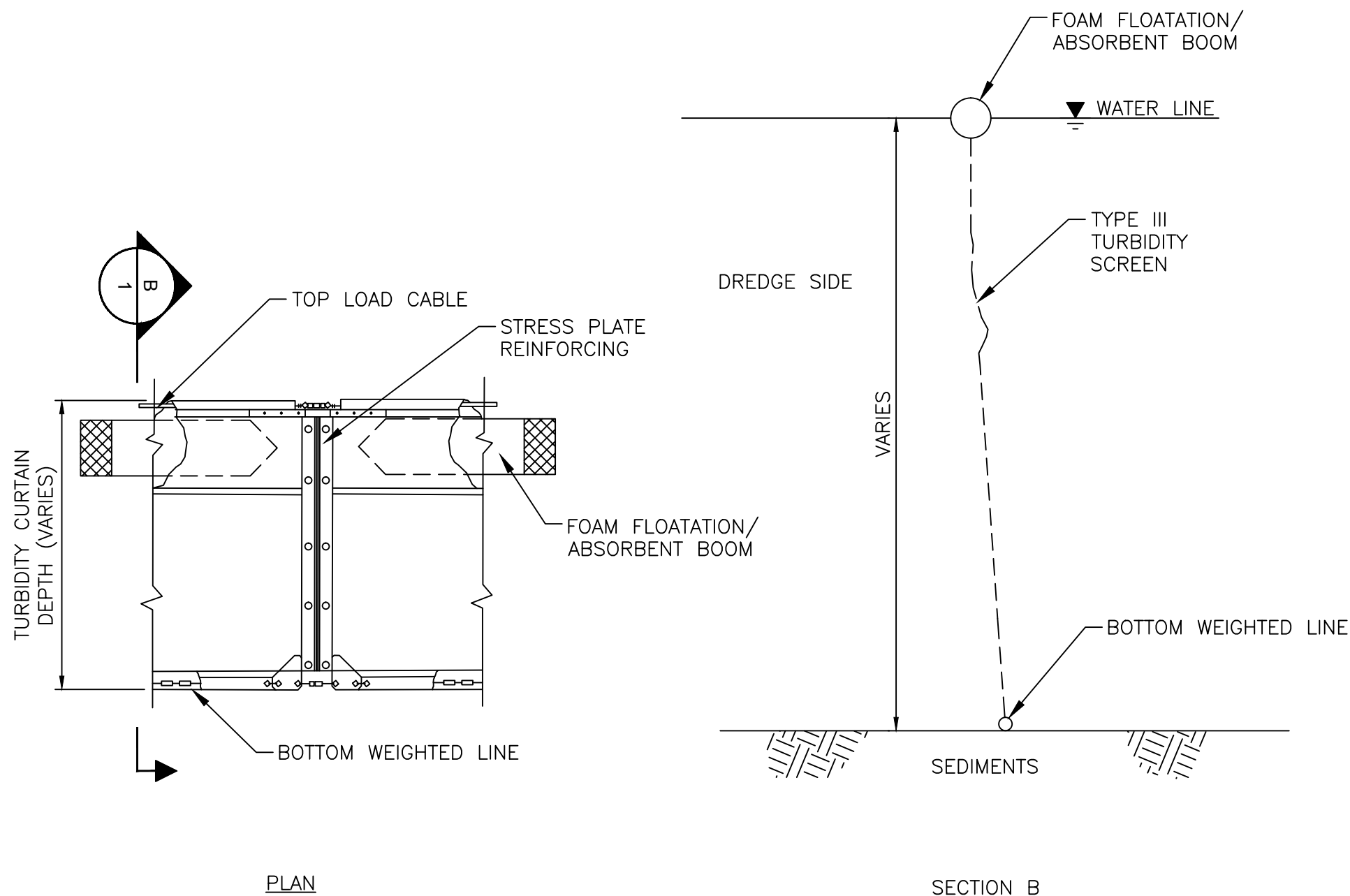
NOT TO SCALE

1  
2

### NOT USED

NOT TO SCALE

2  
2

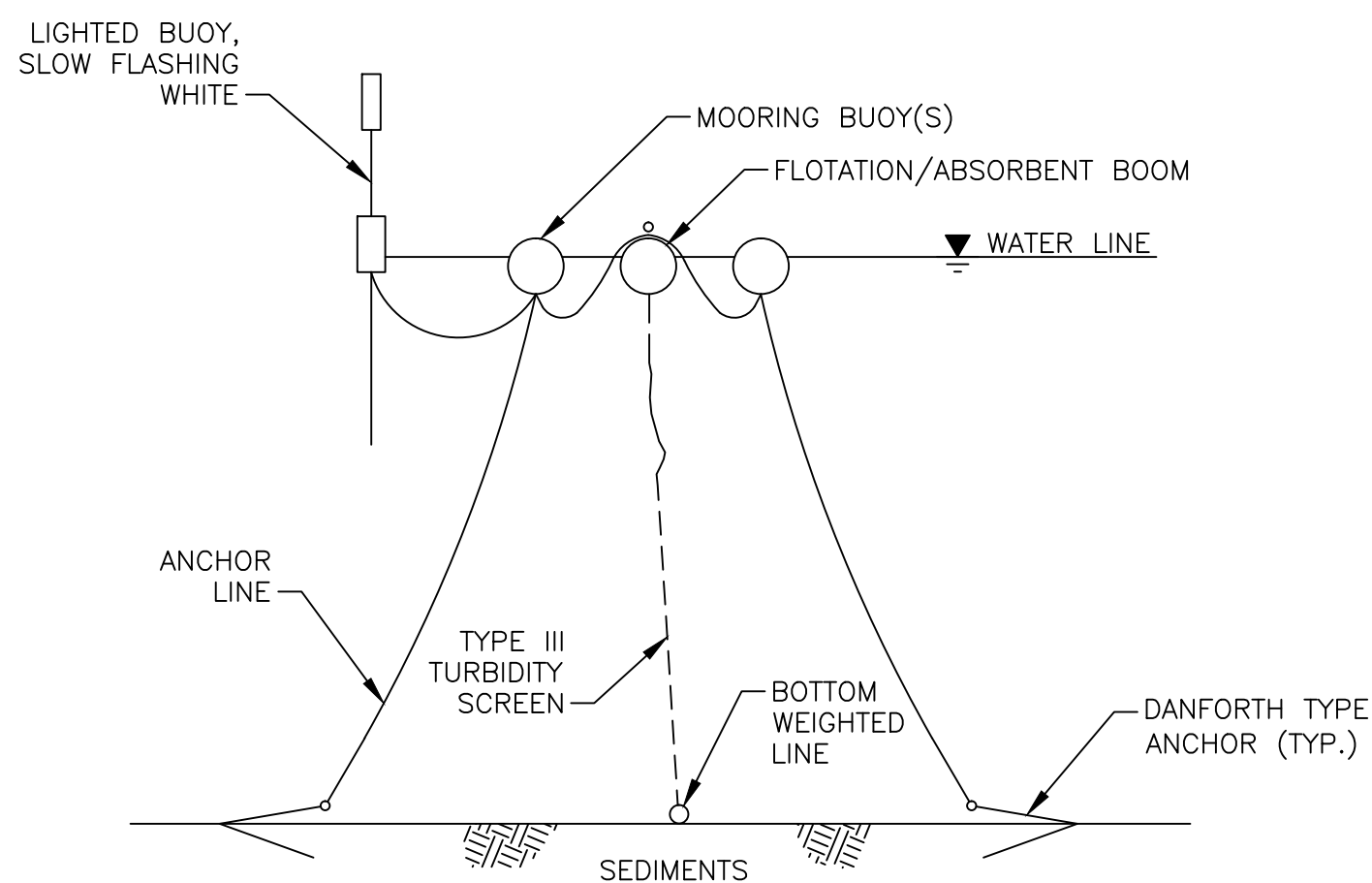


NOTE:  
1. LEAVE SUFFICIENT LENGTH SUCH THAT SCREEN IS IN CONSTANT CONTACT WITH THE SEDIMENT SURFACE.

### FIXED TURBIDITY SCREEN

NOT TO SCALE

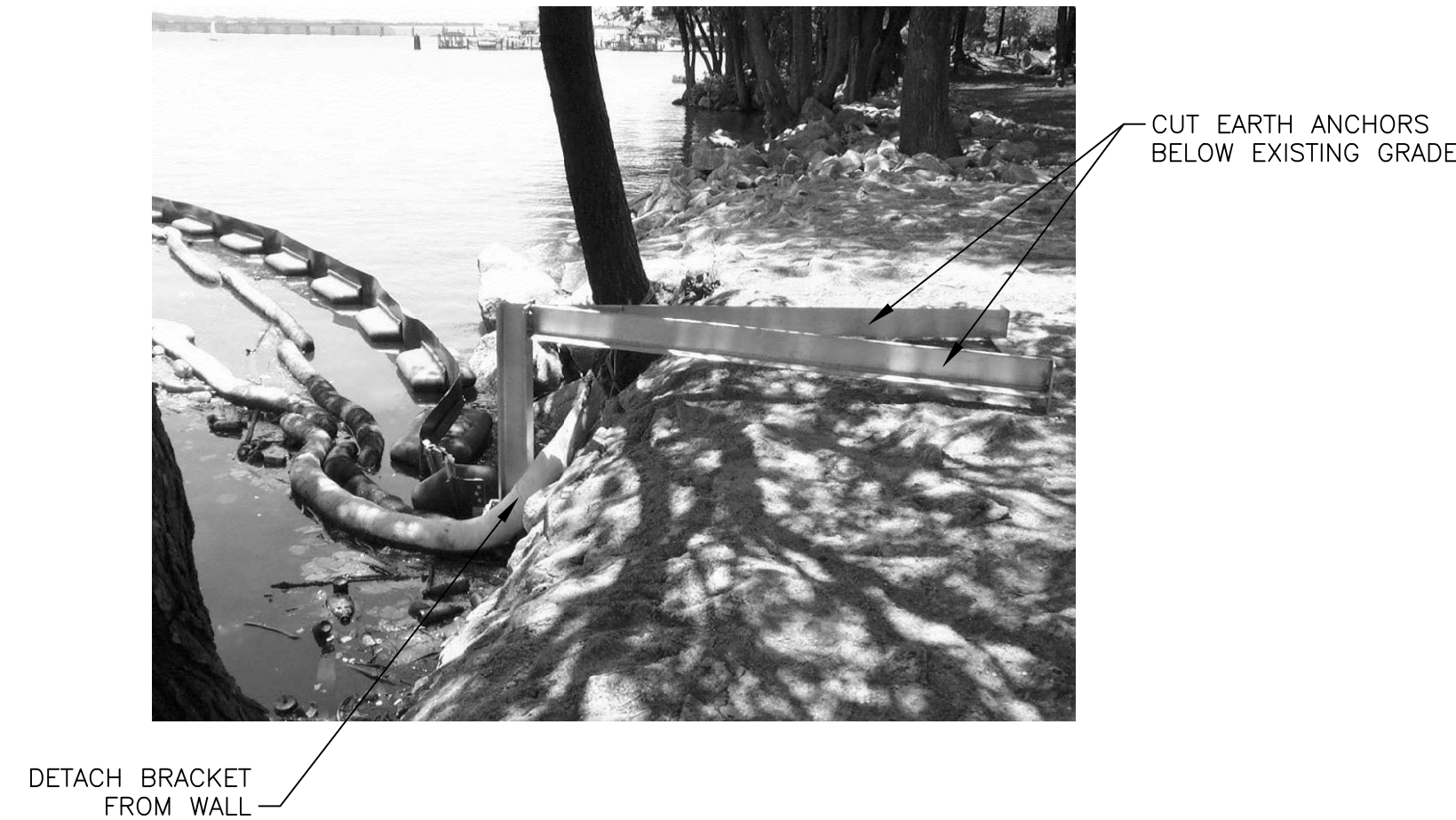
4  
4



### FIXED TURBIDITY SCREEN CORNER DETAIL

NOT TO SCALE

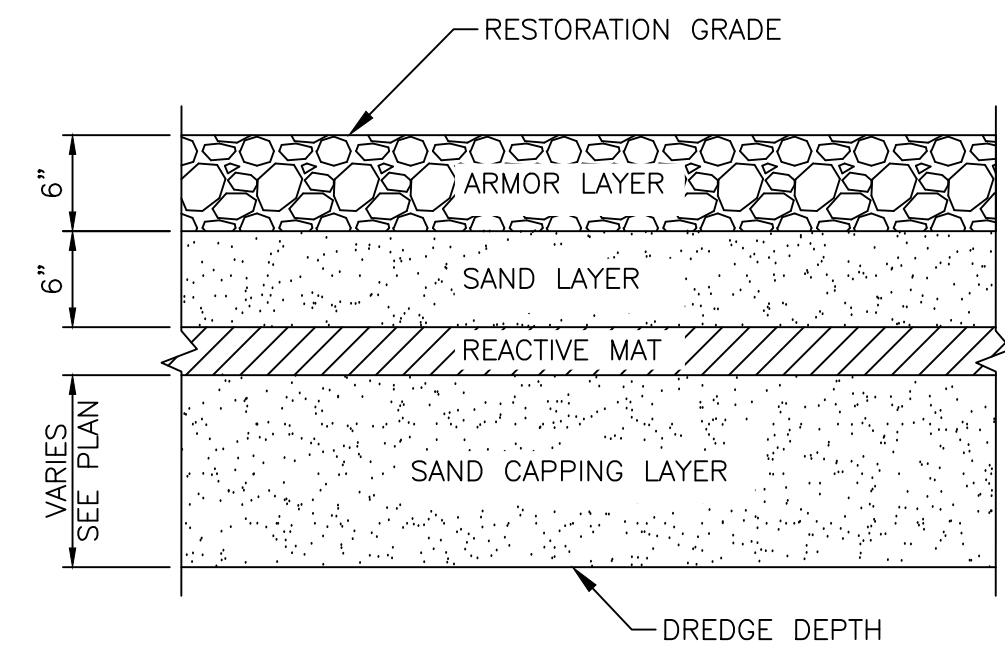
5  
4



### SOUTH BOOM ANCHOR

NOT TO SCALE

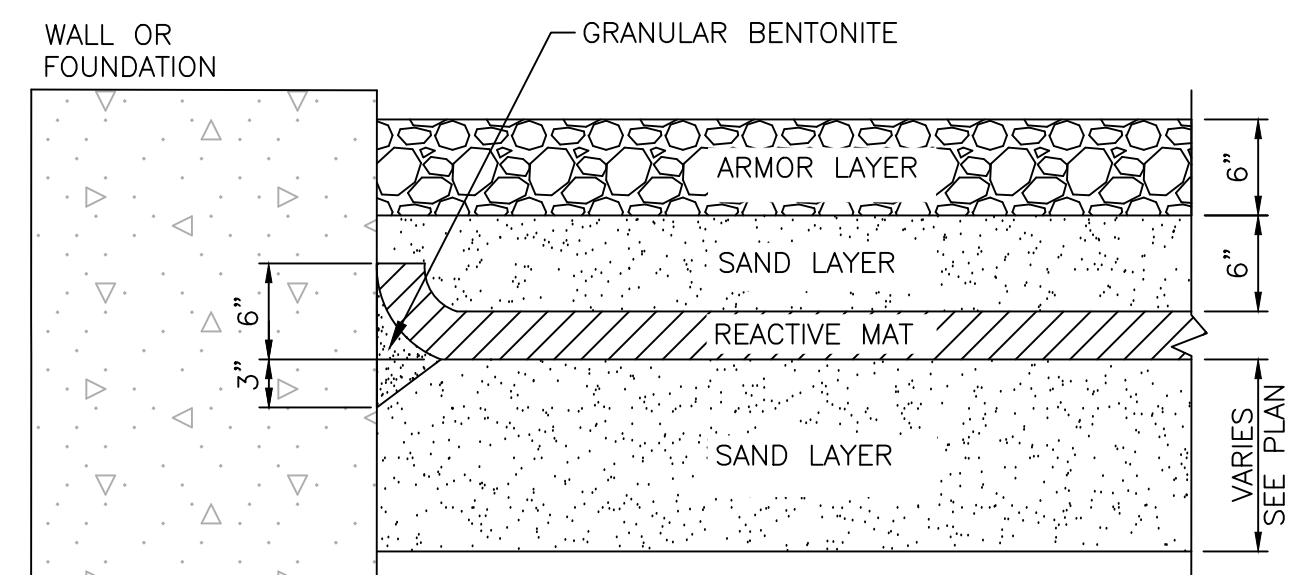
3  
3



### REACTIVE CAP DETAIL

NOT TO SCALE

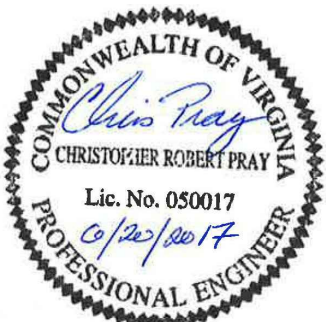
6  
7



### REACTIVE CAP DETAIL AT ABUTTING STRUCTURE

NOT TO SCALE

7  
9



FINAL DESIGN



CITY OF ALEXANDRIA, VIRGINIA  
DEPARTMENT OF PROJECT IMPLEMENTATION  
301 KING STREET  
ALEXANDRIA, VIRGINIA 22313

ORONOCO SITE – POTOMAC RIVER SEDIMENT REMEDIATION

REVISIONS		DATE	BY	DESCRIPTION
		06/20/17	CP	DREDGE AREA
		08/18/17	CP	REMOVED STOCKPILE
ALEXANDRIA PROJECT NO.: 1504002		DATE OF PLAN ISSUANCE: 08/26/16		
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		APPROVED BY: CRP DATE: 08/26/16		

DETAILS

SHEET  
C09

SCALE: AS SHOWN



**TECHNICAL SPECIFICATIONS  
FOR  
ORONOCO SITE – POTOMAC RIVER  
SEDIMENT REMEDIATION  
CITY OF ALEXANDRIA, VIRGINIA**

**Prepared by  
GEI CONSULTANTS, INC.  
1620 I Street NW, Suite 800  
Washington, DC 20006**



---

**TECHNICAL SPECIFICATIONS**  
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**Division 01 General Requirements**

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Section 01 14 00	Work Restrictions
Section 01 18 00	Utility Protection
Section 01 20 00	Price and Payment Procedures
Section 01 30 00	Administrative Requirements
Section 01 33 00	Submittal Procedures
Section 01 35 00	Health and Safety Requirements
Section 01 41 00	Regulatory Requirements - Permits
Section 01 50 00	Temporary Facilities and Controls
Section 01 77 00	Closeout Procedures

**Division 02 Existing Conditions**

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Section 02 61 00	Removal and Disposal of Contaminated Materials

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Section 35 12 13	Marine Signaling Equipment
Section 35 20 20	Turbidity Curtains and Absorbent Booms
Section 35 20 23	Dredging
Section 35 43 10	Aquatic Filling

**Division 44 Pollution Control Equipment**

<u>Section No.</u>	<u>Description</u>
Section 44 01 40	Operation and Maintenance of Water Treatment System



## **SECTION 01 11 00 SUMMARY OF WORK**

### **PART 1 GENERAL**

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

- A. Perform all activities and furnish all labor, materials, equipment, Subcontractor services, and incidentals to implement the Sediment Remediation in accordance with the Contract between the City of Alexandria, VA (City) and the Contractor. The Potomac River - Oronoco Site Sediment Remediation consists of the dredging, removal, and off-Site disposal of MGP-related material and adjacent fill material that may be encountered. This includes, but is not limited to, installation of turbidity curtains, the dredging and disposal of MGP-impacted material, treatment of contaminated water, backfilling, and the restoration of the Site.
- B. The City has retained GEI Consultants, Inc. (GEI) to serve as the engineer of record for the Project (Engineer). GEI will provide input on the review of submittals and Requests for Information (RFIs), and other ancillary services as may be requested by the City.
- C. The City will identify a Contracting Officers Technical Representative (COTR) to act as the primary point of contact for the Contractor selected to perform the Work. The COTR may be an employee of the City or a third party retained to oversee the Work. Regardless of employment status (City employee or third party) or time spent on-Site (full time or part time), the selected Contractor will coordinate all communications through the COTR during the performance of the Work.
- D. All tasks, requirements, deliverables, etc. contained in the Contract Documents are the sole responsibility of the Contractor unless specifically assigned to Others. Project Work to be performed by the Contractor includes, but is not limited to, the following:
  - 1. Prepare and implement a Contractor Health and Safety Plan.
  - 2. Install, operate, and maintain temporary facilities and controls, including:
    - a. Chain link fences and gates.
    - b. Worker health and safety measures.
    - c. Equipment and personnel decontamination facilities.
    - d. Sanitary facilities.
    - e. Dust, odor, and vapor control.
    - f. Water collection/management.
  - 3. Establishing additional survey control points, as necessary.
  - 4. Obtaining all construction-related permits as required for completion of the Work.



Permits/clearances to be obtained by the Contractor may include but are not limited to: Miss Utility, POTW discharge permit, and other local or City permits, as required.

5. Abide by the provisions of all permits and provide coordination and adequate notice as may be required for any construction activity which will require an inspection by regulatory agencies.
6. Perform the remediation:
  - a. Perform the required utility location tasks.
  - b. Identify, temporarily relocate, or protect existing utilities and Site features to remain after the Project is complete.
  - c. Site preparation, to include the demolition of three timber piles located within the marine portion of the Site.
  - d. Providing traffic controls (as necessary).
  - e. Install and remove environmental controls around the work area.
  - f. Dredge and remove MGP-related impacted material..
  - g. Transport the MGP-impacted material and incidental debris to a City approved off-Site disposal facility.
  - h. Cap the dredged area.
  - i. Reinstall all Site features and appurtenances that are damaged or relocated by the Contractor during the performance of the Work.
  - j. Restore the Site as per the Contract Documents.
7. Clean up and restore the Site to preconstruction conditions, including grading and surface restoration, as directed by the COTR. Demobilize and promptly remove all contractor supplies, equipment, and tools from the Site after completion of the Work. Restore, repair, or replace utilities, and other features that were removed, damaged, destroyed, or disrupted during construction.
8. Provide and perform any other equipment, Work, or submittals required to facilitate items 1 through 7 above and the Work shown on the Contract Drawings.

## 1.2. WORK APPROACH

- A. The Bidder should construct their base Bid for the Work using the following set of assumptions:
  1. All sediments/debris must be removed from the site via barge (i.e. sediments may not be trucked from the Site).
  2. Sediment stabilization is to be performed in barge at either the Site or the offload



point (if acceptable to the facility owner).

3. Free liquids in the barges are to be pumped onshore to a water treatment system (regardless of where the sediments are being amended) before the barge departs the Site.
- B. The Bidder may also submit an alternate Bid for the Work using the following set of assumptions:
  1. Sediments/debris may in whole or in part be removed from the Site via truck.
  2. Sediment stabilization may be performed on-Site either in-barge or in a sediment stockpile pad located on the upland portion of the Site.
  3. The Bidder must indicate the amount of sediment that will be transported via barge (if any) when submitting an alternate Bid for this set of assumptions.
- C. Project Price Schedules for the base Bid and alternate Bid sets of assumptions have been included. The City will indicate which Project Price Schedule (i.e. which set of Bid assumptions) will govern the Work, upon award.
- D. Submit an initial baseline project schedule with each Project Price Schedule submitted.
- E. If the Bidder wishes to propose value added ideas, they may be included on a separate Project Price Schedule. Bidders must submit a Bid using the base Bid set of assumptions for their proposal to be considered responsive to the request for proposals issued by the City.

### 1.3. PROJECT CONDITIONS

- A. The Site is owned by the City.
- B. Information regarding Site conditions is intended to assist the Contractor in preparing their Bid. The City and GEI guarantee neither the accuracy of this information nor that this information is necessarily indicative of all conditions that may be encountered, therefore the Contractor agrees that it shall neither have nor assert against the City or GEI any claim for damages by reasons of inaccuracy, inadequacy, incompleteness, or other deficiency of the information provided. The Contractor shall satisfy/verify for himself all existing conditions, including understanding the site data presented in the Bid Documents, affecting his Work by personal investigation. Failure by the Contractor to understand and verify all existing site conditions shall not result in additional charges to the City. Also, neither the information provided by GEI, the City, or their agents or employees, shall act to relieve Contractor of any responsibility hereunder from fulfilling all of the terms and requirements of the Contract Documents.

### 1.4. CONTRACTORS USE OF SITE

- A. The Contractor's use of the Site shall be in accordance with the terms of Contract between the City and the Contractor.



- B. The Contractor shall limit its activities to the Project limits shown in the Contract Drawings. Only stage equipment and materials in designated on-Site areas, as approved by the COTR.

#### 1.5. CONTRACT DOCUMENTS

- A. The Contract Documents include all Specifications, Contract Drawings, figures, and conditions included or referenced in the Request for Proposal package, and any subsequently approved Change Orders.
- B. It is not the intent of the Contract Documents to show every pipe, wire, conduit, utility connection, detail, and appurtenance necessary to complete the Work for this Project. However, such connections and details that may be necessary to complete the Work in accordance with Contract Documents, code requirements, and to the COTR's satisfaction will be included in the Work.
- C. The organization and division of Work contained within the Contract does not make GEI or the City an arbitrator to establish contract limits between the Contractor and any Subcontractor.

#### 1.6. ORDER OF PRECEDENCE

- A. In the event of a conflict between any of the Contract Documents, the following order of precedence will be applied to determine which document will govern (first document listed being of highest precedence):
  - 1. Construction Terms and Conditions issued by the City.
  - 2. Contract Drawings.
  - 3. Specifications.
- B. Any conflicts discovered within the Contract Documents should be immediately brought to the attention of the COTR.

#### 1.7. CONTRACTOR REQUIREMENTS

- A. Perform the scope of Work contained in the Contract Documents.
- B. The Work will be performed on a known contaminated Site. Comply with the requirements of the Contractor Health and Safety Plan. Take precautions as necessary to protect the public and work force personnel from potential hazards.
- C. GEI has collected pre-characterization data for use by the Bidders in disposal facility pricing. The data is included as an appendix to the bid documents. The selected Contractor will be responsible for providing any additional analytical testing that may be required for acceptance of the material at the Contractor selected, City approved, disposal facility used during the completion of the Work.



- D. For any Work performed in close proximity to residential or commercial properties, utilities, or any other third party property, take appropriate precautions to protect the property, utility lines, trees, fences, and other structures and/or related appurtenances from damage.
- E. Repair any damage caused directly or indirectly by the Contractor outside the Project limits, as directed by the COTR, at no additional cost to the City.
- F. Comply with all applicable OSHA safety regulations during the performance of the Work.

1.8. CONTRACT DRAWINGS AND SPECIFICATIONS

- A. Maintain at the Site, 2 copies of all Contract Drawings, Specifications, addenda, approved shop drawings, Change Orders, schedules, and instructions, in good order. Mark one set to record all changes made during construction, and keep one set clean of all markings. Make both sets readily available for review by the City and/or the COTR.
- B. The Contract Drawings include notes. Refer to the Contract Drawings in conjunction with the Specifications.

1.9. WORK BY OTHERS

- A. The City may elect to have perimeter air monitoring performed by Others under separate contract to the City.
- B. Regardless of whether or not the City elects to provide perimeter air monitoring, work zone air monitoring is the responsibility of the Contractor.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 11 00



## **SECTION 01 14 00 WORK RESTRICTIONS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This section contains general restrictions to be followed during the performance of the Work. Other sections of the specification may contain additional requirements/restrictions for the performance of their specific subject matter.

#### **1.2. WORK HOURS**

- A. The City anticipates that Work activities can be conducted between the hours of 7:00 AM to 6:00 PM, on non-Holiday, Mondays through Fridays, and between the hours of 9:00 AM and 6:00 PM on Saturdays, except in cases of emergency, or unless advanced approval is provided by the COTR.
- B. Requests to perform Work beyond the permitted hours will require that the Contractor apply for, and receive, a noise variance permit issued by the City.
- C. Requests to work extended hours (i.e. a second shift) will not be approved.

#### **1.3. SCHEDULE**

- A. *Time is of the essence*, the City must adhere to the Time for Performance included in the Invitation to Bid because of regulatory and public requirements for the use of the River.

#### **1.4. OFFLOADING OF MATERIALS**

- A. Depending on the pricing of the Bids received for the Work, the City may choose to direct the Contractor to not unload any sediments or debris into the onshore area adjacent to the Site.
- B. By submitting a Bid the Contractor acknowledges that they may not be able to offload materials onto the shore adjacent to the Site and may be directed to ship all dredged sediments and debris via barge to one of the pre-approved offload points.

#### **1.5. COMMUNICATION WITH THIRD PARTIES**

- A. Representatives of regulatory agencies from the Virginia Department of Environmental Quality (Virginia DEQ), City, and other local civic organizations may be on-Site to observe and inspect the Work.
  - 1. Maintain a supply of additional Level D Personal Protective Equipment (with the exception of safety boots) on-Site to provide to visiting regulatory agency personnel.
- B. Direct any communications received from regulatory agency personnel to the COTR.



- C. Do not communicate with the media/press, Project stakeholders, elected officials, public, etc. regarding the Work. Refer all external questions and comments to the COTR.

1.6. LAY DOWN AND STORAGE AREA

- A. Limited on-Site lay-down and storage area is available for use at the Site. Do not stage any materials or equipment outside of the Project limits line shown on the Contract Drawings.
- B. Off-Site staging areas may be negotiated for use between the Contractor and third party providers, if needed. Costs associated with any off-Site staging areas must be encumbered in the Contractors base bid.

1.7. VEHICLE ACCESS AND PARKING

- A. Site access is available from Oronoco and North Union Street. A portion of Oronoco St. abutting the Potomac River will be closed and made available for use by the Contractor during the performance of the Work.
- B. Limited parking is available on-Site.
- C. Off-Site parking areas may be negotiated for use between the Contractor and third party providers, if needed. Costs associated with any off-site parking areas must be encumbered in the Contractors base bid.

1.8. SANITARY FACILITIES

- A. Provide sanitary facilities for use by the Contractor personnel, Subcontractors, COTR and visiting agency representatives during the performance of the Work.

1.9. NOISE CONTROL

- A. Comply with the City of Alexandria codes.
- B. Equip vehicles and motorized equipment with appropriate noise control devices to maintain noise levels that conform to current OSHA standards and State and local regulations. Take immediate steps to correct any deficiencies noticed, or as directed by the COTR.
- C. Properly maintain all mufflers and noise control devices, and replace when necessary. Operate all construction equipment in the manner that it was intended. Excessive amount of noise and vibration due to the improper use of equipment, is prohibited.
- D. All equipment that is required to operate beyond standard work hours will, to the maximum extent possible be, electrically driven.

1.10. EQUIPMENT LEFT ON-SITE

- A. Secure all equipment left on-Site outside of standard work hours and remove ignition keys from all equipment.



- B. Ensure that all equipment, where feasible, is de-energized when left on-Site and not in use to prevent electrical/fire/explosive hazards. The Contractor is responsible for the security, operation, and maintenance of any systems that require such services outside standard work hours. If systems are operational outside the standard work hours, provide oversight at all times when equipment is in operation, or provide an electronic monitoring system with a remote communication feature to alert the appropriate personnel of a system failure. Repair system failures in a timely manner such that the Project schedule is not affected.
- C. Any generators running on-Site overnight must be enclosed and/or baffled such that their noise producing levels do not exceed applicable State and local regulations.

## PART 2 PRODUCTS

(Not Applicable)

## PART 3 EXECUTION

### 3.1. ENVIRONMENTAL PROTECTION

- A. For the purposes of this specification, environmental protection is defined as the retention of the environment in its natural state to the greatest extent possible during construction, and to enhance its natural appearance at the conclusion of the Work. Comply with all applicable or relevant and appropriate, Federal, State, local laws, and permit conditions to provide for the abatement and control of any potential environmental impacts arising from the performance of the Work.
- B. The COTR will notify the Contractor of any instances of non-compliance with Federal, State, local laws, or permit conditions and identify corrective actions to be taken. State or local agencies may also provide notification of non-compliance with state or local requirements. After receipt of any notice of non-compliance, the Contractor shall immediately inform the COTR of the proposed corrective action, and take such actions once they are approved by the COTR. Failure or refusal to promptly comply may result in the COTR issuing an order suspending or halting all or parts of the Work until satisfactory corrective action has been taken. Claims for extensions of time or for excess costs or damages due to the stop Work order described above, will be denied.
- C. Do not pollute any stream, river, waterway, roadway, or soil with fuel, oil, grease, lubricant, hydraulic fluid, bitumen, calcium chloride, acid, base, or other harmful materials. Comply with the appropriate Federal, State, and local regulations and guidelines for the handling and disposal of all materials.
- D. Properly dispose of any debris resulting from the performance of the Work. Disposing of any debris, soil, water, effluent, by product, waste, trash, chemical, fuel, oil, grease, lubricant, bitumen, calcium chloride, acid, base, or other harmful material etc., in or adjacent to the Project area is not acceptable. Remove any unauthorized dumped materials and restore the area as directed by the COTR. If necessary, areas contaminated



- as a result of unauthorized activity, failure of environmental controls, or dumping by the Contractor will be remediated at no additional cost to the City.
- E. Dispose of all contaminated materials (debris, soil, water, effluent, by-product, waste, trash, chemical, fuel, oil, grease, lubricant, bitumen, calcium chloride, acid, base, used erosion controls, or other harmful material, etc.) resulting from the Work in accordance with all applicable, or relevant and appropriate, Federal and State laws at a City approved disposal facility prior to completion of the Work.

END OF SECTION 01 14 00



## **SECTION 01 18 00 UTILITY PROTECTION**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This specification contains the requirements for the location and protection of utilities affected by the performance of the Work.

#### **1.2. UTILITY COORDINATION**

- A. The Contractor is solely responsible for any and all required notifications to utility companies prior to commencing the Work, and for response to any emergencies that may arise during the Work. Certain active and inactive utilities may currently be present at the Site. The exact location and type of utility is to be determined by the Contractor without reliance on information provided by the City or GEI.

#### **1.3. PROTECTION OF EXISTING UTILITIES**

- A. Comply with the requirements of all applicable utility protection laws or regulations.
- B. Contact and cooperate with utility companies to locate all utilities (including pipelines, cables, power poles, guy wires, and other structures) on the Site prior to beginning the Work.
- C. Protect all utilities from damage during construction, unless otherwise indicated to be removed or abandoned. If damaged, repair the utilities as required by the utility's owner at the Contractor's expense.
- D. If a utility is encountered that is not shown on the Contract Drawings, or otherwise not made known to the Contractor prior to beginning the Work, promptly take the necessary steps to assure that the utility is not damaged, and notify the COTR in writing of the presence of the utility. The COTR will review the conditions and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the utility.
- E. Immediately notify the COTR of any incident involving a utility.

#### **1.4. SUBMITTALS**

- A. Submit a utility survey as detailed in Specification Section 01 30 00 – Administrative Requirements.
- B. Immediately submit a utility incident report to the City and the COTR for any incident causing direct or indirect damage to a utility. At a minimum, document the following items in a utility incident report:
  - 1. Description of the incident.



2. Damage assessment.
3. Corrective actions taken.
4. Initial estimate on the need for permanent repairs.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 18 00



## **SECTION 01 20 00 PRICE AND PAYMENT PROCEDURES**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The items listed in Project Price Schedule constitute all of the pay items for completion of the Work.

#### **1.2. PAYMENT TERMS**

- A. Payment will not be made unless the proper supporting documentation has been submitted and approved by the COTR.
- B. Payment includes full compensation for all required labor, products, tools, equipment, transportation, services, incidentals, erection, application, or installation of an item of the Work, including overhead and profit.
- C. Payment will not be made for any of the following:
  - 1. Products wasted or disposed of in a manner that is not acceptable.
  - 2. Products determined unacceptable before or after placement.
  - 3. Products not completely unloaded from the transporting vehicle.
  - 4. Products placed beyond the lines and levels of the required Work.
  - 5. Loading, hauling, and disposing of rejected materials.
  - 6. Products remaining on hand after completion of Work.
  - 7. Additional Work undertaken to expedite Contractor's operations.
  - 8. Repair or replacement of property located within or adjacent to the Work area.
- D. Payment will be made for all Work actually performed during a particular payment period. Payments for lump sum items will be made based on the percent completion of the pay item, upon approval by the COTR. Judgments of percent completion of lump sum items will be made in reference to the Project Price Schedule.

#### **1.3. SUBMITTALS**

- A. Submit a City supplied Project Price Schedule with the Bid that has been signed by a company officer who is authorized to contractually bind the company.
- B. Submit monthly invoices on forms that have been supplied by the City.

#### **1.4. QUANTITY ESTIMATES**

- A. Verify estimated quantities for unit prices in the field.



- B. For all unit price Work, the contract price will include an amount equal to the sum of the unit price for each pay item times the estimated quantity of each item as indicated in the Bid Form. The estimated quantities shown on the Project Price Schedule are not guaranteed and are solely for the purpose of comparison of bids and determining an initial contract price. Quantities and measurements supplied or placed in the Work in accordance with the Specifications and Contract Drawings, and verified by the COTR, will determine payment.
- C. The COTR will verify the quantities and classifications of unit price Work invoiced by the Contractor. The COTR will review their preliminary determination with the Contractor before rendering a written decision on an application for payment.
- D. If the actual Work requires more or fewer units than the estimated units indicated on the Project Price Schedule, provide the required units at the contracted unit price. **Under no circumstances may the Contractor exceed estimated quantities without prior written approval from the COTR in the form of a Change Order.**
- E. The COTR reserves the right to increase (via a Change Order) or decrease any pay item quantity, or to eliminate any pay item, as a result of the actual conditions encountered during the performance of the Work.

#### 1.5. MEASUREMENT OF QUANTITIES

- A. Measurement by Weight:
  - 1. Weigh Scales: Certified in accordance with applicable laws and regulations for the state in which the scales are located. Certification must be within a period of not more than one year prior to the date of use.
  - 2. The term “ton” will mean the short ton consisting of 2,000 pounds.
  - 3. For shipments to off-Site disposal facilities, trucks will be weighed at the receiving facility for the purpose of measuring the quantity of Work for payment.
- B. Measurement by Volume:
  - 1. Volumes measured as in-place volumes will be determined by survey. Retain the services of an independent surveyor that is licensed in the State of Virginia. To compute in-place volumes, use the surface comparison function in the surveying software program, or other methods acceptable to the COTR.
  - 2. Unless stipulated otherwise, all pay items that refer to being measured for payment by volume will be interpreted to mean in-place volume.
- C. Measurement by Area:
  - 1. Measured by square dimension using length and width, or radius, and verified by the COTR.
- D. Linear Measurement:



1. Measured by linear dimension, at the item centerline or mean chord, and verified by the COTR.
  - E. Measurement by Time:
    1. Measure by the actual time, rounded to the nearest time unit, and verified by the COTR.
  - F. The City reserves the right to reject measurements for payment provided by the Contractors licensed surveyor and have the units re-measured for payment at their own expense by a licensed surveyor under separate contract to the City.
- 1.6. ASSESSMENT OF NON-CONFORMING WORK
- A. Replace Work, or portions of the Work, that do not conform to the requirements of the Specifications and Contract Drawings, as assessed by the COTR.
  - B. If, in the opinion of the COTR, it is not practical to remove and replace the non-conforming Work, the COTR will direct one of the following remedies:
    1. The non-conforming Work may remain, but the price will be adjusted to a new price at the discretion of the COTR.
    2. Partially repair non-conforming Work to the instructions of the COTR, and the price will be adjusted to a new price at the discretion of the COTR.
  - C. The individual Specification sections specific to the Work in question may modify these options, or may identify a specific formula or percentage price reduction.
  - D. The authority of the COTR to assess non-conforming Work, and identify payment adjustment, is final.
- 1.7. ELIMINATED ITEMS
- A. If any items contained in the Contract Drawings or Specifications are found unnecessary for the proper completion of the Work, the Engineer may, upon written order to the Contractor, eliminate such items from the Work, and such action will in no way invalidate the Contract.
  - B. The Contractor will be paid for all Work performed and all documented costs incurred, including the mobilization of materials, prior to the elimination of such items.
- 1.8. MEASUREMENT AND PAYMENT OF BID ITEMS
- A. The Project Price Schedule lists the pay items for the Work.
  - B. At the direction of the COTR, the Contractor may be asked to perform additional Work. The unit rate schedule included in the Contractor's proposal will be the basis for measurement and payment of equipment and labor for additional Work. Include overhead and profit on the Contractor unit rate schedule for all additional Work.



- C. The following paragraphs specify measurement and payment of the pay items listed on the Project Price Schedule:

**Item 1 Mobilization and Demobilization**

1. Work required to complete Mobilization and Demobilization includes, but is not limited to:
  - a. Movement of personnel, equipment, and materials to the Site, if such movement is not included in any other bid item.
  - b. Preconstruction coordination meetings.
  - c. Demolition of the three nearshore timber piles identified on the Contract Drawings.
  - d. Preparation, submittal, and revision (if required) of all pre-mobilization submittals described in Specification Section 01 33 00 - Submittal Procedures.
  - e. Removing all equipment and materials from the Site and performing any necessary cleanup and restoration after the completion of the Work.
2. Mobilization and Demobilization will be measured for payment as one unit, complete as specified.
3. Payment for Mobilization and Demobilization will be made on a 60% for mobilization and 40% for demobilization split basis of the lump sum price for the Bid item “Mobilization and Demobilization” listed on the Project Price Schedule. Payment of the lump sum price for “Mobilization and Demobilization” will constitute full compensation for all labor, supervision, materials, equipment, start up submittals, incidentals and all other costs necessary to complete Mobilization and Demobilization Work, including the transport of all equipment, labor and temporary facilities and materials to and from the Site.

**Item 2 Survey**

1. Work required to complete Survey includes, but is not limited to:
  - a. Performing bathymetric surveys of the Site before the dredging work begins to record pre-Work conditions, to record the extents of dredging, and to record the restoration bathymetry/aerial extent and depth of the reactive cap constituent layers.
  - b. Performing any other surveying work needed to control and document the Work, as needed.
2. Survey will be measured for payment as one unit, complete as specified.
3. Payment for Survey will be made on a percent complete basis of the lump sum price for the Bid item “Survey” listed on the Project Price Schedule. Payment of the



lump sum price for “Survey” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Survey Work, as specified in Specification Section 02 21 00 – Surveys.

### **Item 3 Temporary Facilities and Controls**

1. Work required to complete Temporary Facilities and Controls includes, but is not limited to:
  - a. Provide odor suppressant foam generators and labor. Foam expendables will be paid under Item 16.
  - b. Furnishing power for the perimeter air monitoring stations that will be operated by Others during the performance of the Work.
  - c. Implement the health and safety requirements specified in the Contractor Health and Safety Plan detailed in Specification Section 01 30 00 – Administrative Requirements.
  - d. Install and maintain temporary facilities and controls as specified in Specifications Section 01 50 00 - Temporary Facilities and Controls, unless specifically identified as being provided by Others.
  - e. Provide Project management and oversight as specified in Section 01 30 00 - Administrative Requirements.
  - f. Maintain and repair all temporary facilities and controls, including those provided by Others, when Work is taking place at the Site.
  - g. Provide a small craft and coxswain for use by the COTR for the duration of the Work.
  - h. All other recurring activities not included in another pay item, or specifically identified as being the responsibility of Others, required to complete the Work.
2. Temporary Facilities and Controls will be measured for payment as one unit, complete as specified.
3. Payment for Temporary Facilities and Controls will be made on a percent complete basis of the lump sum price for the Bid item “Temporary Facilities and Controls” listed on the Project Price Schedule. Payment of the lump sum price for “Temporary Facilities and Controls” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Temporary Facilities and Controls Work, as specified in Specification Section 01 50 00 – Temporary Facilities and Controls.

### **Item 4 Turbidity Controls and Absorbent Booms**



1. Work required to complete Turbidity Controls and Absorbent Booms includes, but is not limited to:
  - a. Removing the existing boom/curtain that is currently on-Site after the project environmental controls are in-place.
  - b. Salvaging the existing onshore anchor point and relocating as shown on the Contract Drawings.
  - c. Furnishing, installing, inspecting, maintaining, repairing and/or replacing, and removing turbidity curtains and absorbent booms in accordance with Specification Section 35 20 20 – Turbidity Controls and Absorbent Booms, as needed to complete the Work.
  - d. Taking any required correction action, as may be directed by the COTR, to remediate conditions associated with a failure of the turbidity controls and/or absorbent booms.
  - e. Preparing, submitting, and revising all submittals required in Specification Section 35 20 20 – Turbidity Controls and Absorbent Booms.
  - f. At the conclusion of the dredging and capping work, performing an inspection of the controls with the COTR and replacing any components noted as being near the end of their service life.
  - g. Prior to demobilization, re-positioning of the controls as may be directed by the COTR.
2. Turbidity Controls and Absorbent Booms will be measured for payment as one unit, complete as specified.
3. Payment for Turbidity Controls and Absorbent Booms will be made on a percent complete basis of the lump sum price for the Bid item “Turbidity Controls and Absorbent Booms” listed on the Project Price Schedule. Payment of the lump sum price for “Turbidity Controls and Absorbent Booms” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Turbidity Controls and Absorbent Booms Work, as specified in Specification Sections 35 20 20 – Turbidity Controls and Absorbent Booms.

#### **Item 5 Marine Signaling Equipment**

1. Work required to complete Marine Signaling Equipment includes, but is not limited to:
  - a. Installation, operation, maintenance, and removal of marine signaling equipment in accordance with Specification Section 35 12 13 – Marine Signaling Equipment.



- b. Complying with all applicable U.S. Coast Guard regulations for the use of temporary signaling equipment, including any required coordination, during the performance of the Work.
2. Marine Signaling Equipment will be measured for payment as one unit, complete as specified.
3. Payment for Marine Signaling Equipment Work will be made on a percent complete basis of the lump sum price for the Bid item “Marine Signaling Equipment” listed on the Project Price Schedule. Payment of the lump sum price for “Marine Signaling Equipment” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Marine Signaling Equipment Work, as specified in Specification Section 35 12 13 – Marine Signaling Equipment.

#### **Item 6 Dredging**

1. Work required to complete Dredging includes, but is not limited to:
  - a. The removal of impacted sediments and debris to the lines and grades shown on the Contract Drawings.
  - b. The loading of impacted sediments and debris onto barges or stockpile pads.
  - c. Segregating sediments from debris as needed to accommodate the requirements of the approved disposal facilities.
  - d. Performing any dredge bucket changes to remove debris, as needed.
2. Dredging Work will be measured for payment on an in place cubic yard basis, as verified by survey.
3. Payment for Dredging Work will be made in accordance with the unit price for the Bid item “Dredging” listed on the Project Price Schedule. Payment of the unit price for “Dredging” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Dredging Work, as specified in Specification Section 35 20 23 – Dredging.

#### **Item 7 Sediment Barging**

1. Work required to complete the Sediment Barging pay item includes, but is not limited to:
  - a. Transportation of the impacted sediments, via barge, to the approved offload point for the Project.
  - b. The approved offload points for impacted sediments from the Project are as follows:

Primary Offload Point:



Vulcan Materials Company  
Woodbridge Offload Point  
13204 Jefferson Davis Hwy, Woodbridge, VA 22191

Secondary Offload Point:

Port Tobacco at Weanack  
Weanack Land, L.L.C.  
461 Shirley Plantation Road  
Charles City, Virginia 23030

2. Sediment Barging will be measured for payment on an in place cubic yard basis, as verified by survey.
3. Payment for Sediment Barging Work will be made in accordance with the unit price for the Bid item "Sediment Barging" listed on the Project Price Schedule. Payment of the unit price for "Sediment Barging" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Sediment Barging Work, as specified in Specification Section 02 61 00 – Removal and Disposal of Contaminated Materials.

**Item 8 Transportation and Disposal: Sediments**

1. Work required to complete the Transportation and Disposal: Sediments pay item includes, but is not limited to:
  - a. Loading sediments from the barge/stockpile pad onto trucks.
  - b. Performing paint filter tests to demonstrate compliance with the requirements of the approved disposal facility.
  - c. Performing any additional analytical testing (i.e. additional testing required by the disposal facility beyond what has already been completed by the City and supplied with the Contract Documents) required to dispose of the sediments at the approved off-Site disposal facility.
  - d. Transportation and disposal of dredged sediments from the Project Site at the approved disposal facility.
  - e. The approved disposal facilities for sediments dredged from the Project Site is as follows:

Primary Disposal Facilities:

Old Dominion Landfill – 2001 Charles City Road, Henrico, VA 23231  
King & Queen Landfill – 4443 Iris Road, Little Plymouth, VA 23091  
POC: David Haskin, Special Waste Executive  
Phone: (480) 718 - 4127

Secondary Disposal Facility:



Waste Management of Virginia, Charles City Landfill  
8000 Chambers Road, Charles City, VA 23030.  
POC: Bethany Enterline, Technical Services Representative;  
Phone: (804) 474 - 8574

2. Transportation and Disposal: Sediments will be measured for payment on a per ton basis, as documented by disposal facility scale weight tickets.
3. Payment for Transportation and Disposal: Sediments Work will be made in accordance with the unit price for the Bid item "Transportation and Disposal: Sediments" listed on the Project Price Schedule. Payment of the unit price for "Transportation and Disposal: Sediments" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Transportation and Disposal: Sediments, as specified in Specification Section 02 61 00 – Removal and Disposal of Contaminated Materials.

**Item 9 Transportation and Disposal: Debris**

1. Work required to complete the Transportation and Disposal: Debris pay item includes, but is not limited to:
  - a. Transportation and disposal of debris dredged from the Project Site at the approved disposal facility.
  - b. Transportation and disposal of the turbidity controls and absorbent boom (including the system that was in-place before the performance of the Work, and the system put in place during the Work) at the approved disposal facility.
2. Transportation and Disposal: Debris will be measured for payment on a per ton basis, as documented by disposal facility scale weight tickets.
3. Payment for Transportation and Disposal: Debris Work will be made in accordance with the unit price for the Bid item "Transportation and Disposal: Debris" listed on the Project Price Schedule. Payment of the unit price for "Transportation and Disposal: Debris" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Transportation and Disposal: Debris, as specified in Specification Section 02 61 00 – Removal and Disposal of Contaminated Materials.

**Item 10 Water Treatment System Mobilization and Demobilization**

1. Work required to complete the Water Treatment System Mobilization and Demobilization includes, but is not limited to:
  - a. Movement of personnel, equipment, and materials to the Site required for setup of the water treatment system.
  - b. Installation, setup, and function testing of the water treatment system.



- c. Removal of the water treatment system at the conclusion of the Work.
2. Water Treatment System Mobilization and Demobilization Work will be measured for payment as one unit, complete as specified.
3. Payment for Water Treatment System Mobilization and Demobilization will be made on a 60% for mobilization and 40% for demobilization split basis of the lump sum price for the Bid item “Water Treatment System Mobilization and Demobilization” listed on the Project Price Schedule. Payment of the lump sum price for “Water Treatment System Mobilization and Demobilization” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Water Treatment System Mobilization and Demobilization Work, as specified in Specification Section 44 01 40 - Operation and Maintenance of Water Treatment System.

**Item 11 Operation and Maintenance of Water Treatment Equipment**

1. Work required to complete Operation and Maintenance of Water Treatment Equipment includes but is not limited to:
  - a. Treating all barge/stockpile runoff, decontamination, and other liquids to a level compliant with the governing permits, prior to discharge to the approved outlet.
  - b. Performing any analytical testing and reporting that is required under the discharge permit.
  - c. Paying any and all disposal fees associated with discharge of the treated wastewater.
  - d. Providing all materials and labor to perform media change out as needed to operate the water treatment system to be in conformance with the discharge permit.
  - e. Transportation and lawful disposal of all spent filtration media.
2. Operation and Maintenance of Water Treatment Equipment Work will be measured for payment on a per Calendar Day basis. Payment will be made for each COTR approved Calendar Day of operation and treatment during the performance of the Work.
3. Payment for Operation and Maintenance of Water Treatment Equipment Work will be made in accordance with the unit price for the Bid item “Operation and Maintenance of Water Treatment Equipment” listed on the Project Price Schedule. Payment of the unit price for “Operation and Maintenance of Water Treatment Equipment” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Operation and



Maintenance of Water Treatment Equipment Work, as specified in Specification Section 44 01 40 – Operation and Maintenance of Water Treatment System.

**Item 12 Sediment Amendment**

1. Work required for Sediment Amendment includes, but is not limited to:
  - a. Furnishing Portland cement, cement kiln dust (CKD), or other COTR approved amendment to reduce the moisture content of the sediments to a level that meets the requirements of the disposal facility.
  - b. For the purposes of constructing a Bid, assume that 12% by weight Portland cement will be added to the sediments to reduce the moisture content to levels that will allow for the lawful transport of the materials and their acceptance at the disposal facility.
  - c. All material handling and movement as required to amend the materials and reduce the moisture content to meet the requirements of the disposal facility.
2. Sediment Amendment will be measured for payment on a lump sum basis, complete as specified.
3. Payment for Sediment Amendment Work will be made on a percent complete basis of the lump sum price for the Bid item “Sediment Amendment” listed on the Project Price Schedule. Payment of the lump sum price for “Sediment Amendment” will constitute full compensation for the amendment of sediments for the purpose of moisture reduction including all labor, equipment, and incidentals required to complete Sediment Amendment Work, as specified in Specification Section 02 61 00 – Removal and Disposal of Contaminated Materials.

**Item 13 Aquatic Filling - Sand**

1. Work required to complete Aquatic Filling - Sand includes, but is not limited to:
  - a. Delivery and placement of approved aquatic fill sand materials to restore the Site as shown on the Contract Drawings.
2. Aquatic Filling – Sand will be measured for payment on a per cubic yard basis, as verified by survey.
3. Payment for Aquatic Filling – Sand Work will be made in accordance with the unit price for the Bid item “Aquatic Filling – Sand” listed on the Project Price Schedule. Payment of the unit price for “Aquatic Filling – Sand” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Aquatic Filling – Sand Work, as specified in Specification Section 35 43 10 – Aquatic Filling.

**Item 14 Aquatic Filling - Stone**

1. Work required to complete Aquatic Filling - Stone includes, but is not limited to:



- a. Delivery and placement of approved aquatic fill stone materials to restore the Site as shown on the Contract Drawings.
  - b. Order and have on hand a sufficient quantity of the stone fill material such that an additional 20% of the surficial area covered under the base Bid could be added to the scope of Work to make any adjustments (i.e. additional reactive cap placement) that may be required based on conditions observed in the field.
2. Aquatic Filling – Stone will be measured for payment on a per ton basis of stone, as verified by weight tickets from the borrow source.
3. Payment for Aquatic Filling – Stone Work will be made in accordance with the unit price for the Bid item “Aquatic Filling – Stone” listed on the Project Price Schedule. Payment of the unit price for “Aquatic Filling – Stone” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Aquatic Filling – Stone Work, as specified in Specification Section 35 43 10 – Aquatic Filling.

**Item 15 Aquatic Filling – Reactive Cap Material**

1. Work required to complete Aquatic Filling with reactive materials includes, but is not limited to:
  - a. Delivery and placement of approved aquatic fill reactive cap materials to restore the Site as shown on the Contract Drawings.
  - b. Order and have on hand a sufficient quantity of the reactive cap material such that an additional 20% of the surficial area covered under the base Bid could be added to the scope of Work to make any adjustments (i.e. additional reactive cap placement) that may be required based on conditions observed in the field.
2. Aquatic Filling – Reactive Cap Material will be measured for payment on a per square foot basis, as verified by survey.
3. Payment for Aquatic Filling – Reactive Cap Material Work will be made in accordance with the unit price for the Bid item “Aquatic Filling – Reactive Cap Material” listed on the Project Price Schedule. Payment of the unit price for “Aquatic Filling – Reactive Cap Material” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Aquatic Filling – Reactive Material Work, as specified in Specification Section 35 43 10 – Aquatic Filling.

**Item 16 Odor Control Foam System – Expendables**

1. Work required to complete Odor Control Foam System – Expendables includes, but is not limited to:



- a. The furnishing of odor control foam as directed by the COTR.
2. Odor Control Foam System – Expendables will be measured for payment by the gallon of odor suppressant concentrate(s) used, as directed by the COTR.
3. Payment for Odor Control Foam System – Expendables Work will be made in accordance with the unit price for the Bid item “Odor Control Foam System – Expendables” listed on the Project Price Schedule. Payment of the unit price for “Odor Control Foam System – Expendables” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to provide Odor Control Foam System – Expendables Work, as directed by the COTR.

**Item 17 Channel Creation – Not to Exceed Allowance**

1. The City anticipates that some over dredging will be required to create a channel suitable for bringing machinery and/or barges onto the Site because of the shallow depth of water.
2. Each Bidder must provide their estimated quantity of additional dredging (i.e. sediment removal beyond the allowable over dredge depths/aerial extents shown on the Contract Drawings) that will be required to create a channel that will support their specific equipment needs based on their preferred means and methods to complete the Work.
3. Only dredging performed within the limits of the proposed channel outlined in the Contractors Bid will be measured for payment under this Item. Dredging beyond the allowable over dredge limits performed outside the dredge channel outline submitted with the Contractors Bid will be considered non-pay Work as detailed in Specification Section 35 20 20 - Dredging.
4. Work required to complete Channel Creation includes, but is not limited to:
  - a. The removal of sediments to allow for machinery/barges to be brought onto the Site.
  - b. The loading of sediments onto barges or stockpile pads.
5. Channel Creation will be measured for payment on a per cubic yard basis, as verified by survey.
6. The Channel Creation volume of removed sediments and resulting additional disposal and fill costs will be considered when evaluating proposals to perform the Work.
7. The quantity of dredging required to complete the Channel Creation Work included on the Contractors Bid will be considered as a not to exceed quantity, any overage of which will be treated as non-pay work in the same manner as dredging beyond the allowable over dredge limits.



8. Payment for Channel Creation Work will be made in accordance with the unit price for the Bid item “Channel Creation” listed on the Project Price Schedule. Payment of the unit price for “Channel Creation” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Channel Creation Work, as specified in Specification Section 35 20 23 – Dredging.

**Alt 1 Standby Time**

1. Include an hourly rate for standby time to be charged for delays incurred at the direction of the COTR. The standby rate shall include costs for all labor, overhead, materials, sub costs, and equipment that might be impacted by a delay.
2. Standby charges will be allowed only when the normal progress of on-Site activities is interrupted for reasons that are not chargeable to the Contractor (e.g. archeological find).
3. The failure of the Contractor to meet production estimates is not a valid reason for the accrual of Standby Time. The COTR will act as the sole and final arbiter of when the Contractor is due Standby Time.
4. The Contractor will be reimbursed at the hourly standby rate beginning at the time that a delay is incurred at the direction of the COTR.

**Alt 2 Transportation and Disposal: Wastewater**

1. This alternate Item is for the disposal of wastewater generated after the on-Site wastewater treatment system has been demobilized. This alternate Item may only be used/invoiced at the direction of the COTR.
2. Work required to complete the Transportation and Disposal: Wastewater pay item includes, but is not limited to:
  - a. Collection, transportation, and disposal of wastewater and decontamination fluids from the Project Site after the removal of the water treatment system.
  - b. Performing any analytical testing required for the disposal of the liquid waste.
3. Disposal will be measured for payment on a per gallon basis, as documented by an appropriately calibrated and inspected flow meter at the receiving facility.
4. Payment for Transportation and Disposal: Wastewater Work will be made in accordance with the unit price for the Bid item “Transportation and Disposal: Wastewater” listed on the Project Price Schedule. Payment of the unit price for “Transportation and Disposal: Wastewater” will constitute full compensation for all labor, supervision, fees, materials, equipment, incidentals and all other costs necessary to complete Transportation and Disposal: Wastewater Work, as specified in Specification Section 02 61 00 – Removal and Disposal of Contaminated Materials.



**Alt 3      Sediment Amendment - Ton**

1. This alternate Item may only be used at the direction of the COTR if additional amendment, beyond the base bid amount, is required for the completion of the Work.
2. Work required for Sediment Amendment includes, but is not limited to:
  - a. Furnishing Portland cement, cement kiln dust (CKD), or other COTR approved amendment to reduce the moisture content of the sediments to levels that will allow for the lawful transport of the materials and their acceptance at the disposal facility.
  - b. All material handling and movement as required to amend the materials and reduce the moisture content to meet the requirements of the disposal facility.
3. Sediment Amendment – Ton will be measured for payment on a per ton basis, as documented by weight tickets from the supplier.
4. Payment for Sediment Amendment – Ton Work will be made in accordance with the unit price for the Bid item “Sediment Amendment - Ton” listed on the Project Price Schedule. Payment of the unit price for “Sediment Amendment - Ton” will constitute full compensation for the amendment of sediments for the purpose of moisture reduction including all labor, equipment, and incidentals required to complete Sediment Amendment - Ton Work, as specified in Specification Section 02 61 00 – Removal and Disposal of Contaminated Materials.

**Alt 4      Additional Mobilization and Demobilization**

1. The City may, at their sole discretion, direct the Contractor to cap the Site with sand only, and then perform additional monitoring to determine if the reactive barrier can be removed from the scope.
2. Work required to complete the Additional Mobilization and Demobilization pay item includes, but is not limited to:
  - a. Movement of personnel, equipment, and materials to the Site, if such movement is not included in any other bid item.
  - b. Preconstruction coordination meetings.
  - c. Removing all equipment and materials from the Site and performing any necessary cleanup and restoration after the completion of the Work.
3. Additional Mobilization and Demobilization will be measured for payment as one unit, complete as specified.
4. The price submitted for this item must remain valid for two (2) calendar years from the date that the Bid is submitted to the City.



5. A 4% increase will be applied to the unit rates for Items 14 and 15 for Work measured for payment as part of those items that is performed after a re-mobilization to the Site.
6. Payment for Additional Mobilization and Demobilization will be made on a 60% for mobilization and 40% for demobilization split basis of the lump sum price for the Bid item "Additional Mobilization and Demobilization" listed on the Project Price Schedule. Payment of the lump sum price for "Additional Mobilization and Demobilization" will constitute full compensation for all labor, supervision, materials, equipment, start up submittals, incidentals and all other costs necessary to complete Additional Mobilization and Demobilization Work, including the transport of all equipment, labor and temporary facilities and materials to and from the Site.

**Alt 5 Reactive Barrier – Restocking**

1. This alternate Item is to cover expenses incurred by the Contractor for returning unused rolls of reactive barrier material to the manufacturer that went unused because of the City mandated over-ordering (Refer to Item 15).
2. Work required to complete the Reactive Barrier - Restocking pay item includes, but is not limited to:
  - a. Returning the unused rolls to the manufacturer or distributor.
  - b. Paying any fees associated with returning the materials to the manufacturer or distributor.
3. Reactive Barrier - Restocking will be measured for payment as one unit, complete as specified.
4. Payment for Reactive Barrier - Restocking Work will be made on a percent complete basis of the lump sum price for the Bid item "Reactive Barrier - Restocking" listed on the Project Price Schedule. Payment of the lump sum price for "Reactive Barrier - Restocking" will constitute full compensation all labor, equipment, and incidentals required to complete Reactive Barrier - Restocking Work.

**PART 2 PRODUCTS**

(Not Applicable)

**PART 3 EXECUTION**

(Not Applicable)

END OF SECTION 01 20 00



## **SECTION 01 30 00 ADMINISTRATIVE REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This Section describes Project administrative requirements; the minimum level of coordination and meetings required to execute the Work, and required pre-mobilization submittals.

#### **1.2. ON-SITE CONSTRUCTION PERSONNEL**

- A. The City will maintain a dedicated and non-working COTR for the duration of the Work. The COTR will be responsible for construction quality assurance and ensuring that the Contractor completes the Work in accordance with the Contract Documents. The COTR will not direct the Contractor on the specific means and methods of construction, however, the COTR will advise the Contractor of non-compliance with the Contract Documents and identify required corrective action(s).
- B. The Contractor will maintain a full-time on-site Superintendent, who will be responsible for quality assurance, Contractor health and safety, and competent person(s) for the duration of the Work. The Superintendent will be responsible for the supervision and/or coordination of all Contractor employees, Subcontractors, manufacturers, fabricators, suppliers, distributors, installers, and testing agencies whose services, materials or equipment are required to ensure the completion of the Work. The Superintendent will have sufficient qualifications, experience, and authority to act as a single point of contact for the on-Site staff, and to make adjustments to the means and methods as needed and as requested by the COTR.
- C. The Contractor will maintain a full-time on-Site Health and Safety officer for the duration of the Project. If appropriately qualified, the Superintendent may also serve as the Health and Safety Officer. The Health and Safety officer must have training and experience that is acceptable to the COTR to serve on this Project.
- D. Any material changes to the processes, Subcontractors, staffing, sequencing, equipment, or materials used in the Work will require review and acceptance by the COTR.

#### **1.3. MEETINGS**

- A. Attend all Project meetings as deemed necessary by the City and/or the COTR during the term of the Contract.
- B. A pre-construction meeting will be held at the Site prior to the start of the Work. At a minimum, the Contractor's project manager and Superintendent for the Project will attend the meeting. It is recommended that the Contractor assemble input from primary Subcontractors prior to this meeting.



1. This meeting is intended to make certain that the Work is properly scheduled, responsibilities are coordinated among Subcontractors and suppliers, and that those responsibilities are reflected on the Contractor submittals. Questions concerning the administrative requirements outlined during the pre-construction conference or any other aspect of the Project may also be addressed.
  - C. Beginning with the mobilization to the Site, the Contractor will facilitate weekly construction meetings for the duration of the Work. Prior to mobilization, if necessary, bi-weekly meetings may be held via teleconference. After mobilization, weekly meetings will be held at the Site. Present a progress update at weekly construction meetings that includes tasks completed from the prior week, currently active tasks, and tasks/activities planned for the next two weeks along with an updated Project schedule. The format of the two week look ahead must be approved by the COTR.
  - D. The standard day and time for the weekly construction meeting will be established based on mutual agreement between all regular participants.
  - E. Special construction meetings will be held at the Site or other designated location to discuss urgent construction issues. The Contractor or COTR may call special construction meetings. Coordination (agenda, meeting minutes, location, time, and attendance) of special construction meetings is the responsibility of the organization calling the meeting. Special construction meetings will be called judiciously.
  - F. Individuals authorized to discuss and make decisions on behalf of the Contractor, relative to the meeting agenda, must participate in all weekly construction and special construction meetings.
  - G. Make physical arrangements for all meetings to be held on the Site.
  - H. All expenses associated with attending the meetings, except those that are incurred by the City, their representatives, or consultants, are to be borne by the Contractor.
- 1.4. REQUESTS FOR INFORMATION, CLARIFICATIONS, AND CHANGES
- A. All communications regarding discrepancies, claims, and change conditions will be in accordance with the Terms and Conditions.
  - B. All requests for Project information, clarifications, or changes in the requirements of the Contract Documents must be made in writing to the COTR.
  - C. Written requests must be provided regardless of any preceding conversations and preliminary decisions regarding the subject matter(s).
  - D. At the discretion of the COTR, e-mail communications may qualify as “requests made in writing” for the purposes of this provision.
  - E. The COTR will provide written responses to each request.



- F. The COTR may also issue clarifications and/or amendments based on their own assessment of Project needs.
- G. Any potential increases or decreases in Contractor compensation due to amendments will be in accordance with the provisions of the Terms and Conditions.
- H. If latent or unforeseen conditions require modifications to the Contract, the Contractor must propose changes in the Work by submitting a detailed request to include labor rates, equipment rates, material costs, etc. for a change to the COTR.
- I. Document Change Order requests in accordance with the requirements of the Terms and Conditions, Supplemental Conditions, and any additional procedures set forth during procurement.

1.5. RECORDS

- A. Maintain copies on-Site of all Project correspondence and Project documents generated during the Work.

1.6. PRE-MOBILIZATION SUBMITTALS

- A. All submittals are subject to review and approval by the City and/or the Engineer. Provide all submittals to the COTR who will then forward them onto the appropriate party for review. Submittals will not be approved until the reviewing party has determined that they meet the minimum requirements of these specifications. Claims for lost time or requests for extensions based on rejected pre-mobilization submittals will be denied.
- B. Contractor Health and Safety Plan:
  - 1. Prepare and submit a site specific Contractor Health and Safety Plan.
  - 2. Refer to Specification Section 01 35 00 for details on what must be included in the Contractor Health and Safety Plan.
- C. Critical Path Method Project Schedule:
  - 1. Prepare a Critical Path Method (CPM) project schedule and provide it to the COTR at the first post-award meeting. Update and disseminate the schedule on a weekly basis.
  - 2. Prepare one CPM showing the projected schedule if the Contractor is permitted to send dredged sediments and debris off-site via truck (i.e. it is permissible to cast dredge sediments onto shore for stabilization and loadout), if that is the preferred means and methods of the Bidder (for all or part of the sediments to be removed).
  - 3. Prepare a second projected schedule as if all the sediments require removal via barge.
- D. Pre-Construction Condition Documentation:



1. Perform a pre-construction condition documentation of the Site to 50 feet beyond the Project limits under the supervision of the COTR.
  - a. Submit the findings of the pre-construction condition documentation to the COTR for review and approval prior to mobilization.
  - b. Include video/photographic documentation of the existing conditions of the Site and surrounding structures.
    - i. Include video documentation and place particular emphasis on documenting the pre-construction conditions of the bulkhead and pier structure abutting the Site.
  - c. Claims determined to be resulting from pre-existing structural and/or cosmetic damage, not identified during the pre-construction survey, will be the sole responsibility of the Contractor to remedy to the satisfaction of the applicable owner(s).

E. Schedule of Permits:

1. Submit copies of all supplemental and/or recurring data required by the permits required by the City to the COTR, as needed. Include documentation that the supplemental data was provided to the entity that issued the permit, according to the schedule required by the permit.
2. Submit copies of completed permit applications to the COTR.
3. Submit copies of fully executed permit applications and final permits to the COTR.

F. Remedial Action Contingency Plan:

1. Prepare a Remedial Action Contingency Plan (RACP). This plan will describe the provisions required for responding to Site-related emergencies that could potentially occur during the Work. The RACP will, at a minimum, contain the following components:
  - a. A spill response plan (SRP) for addressing spills that occur on Site during remedial construction activities. The SRP will describe the means, methods, and facilities required to prevent soil/sediment, water, structure, equipment, and material impacts caused by spills; provide information regarding spill containment and cleanup, and provide information related to decontamination measures.
  - b. Procedures that the Contractor's personnel will follow in the event of a hurricane or other inclement weather that will force a closure of the Site.
  - c. Procedures that Contractor's personnel will take in response to general emergencies (fire, injury, etc.).
  - d. Designation of an emergency coordinator.



- e. Include a current list of all emergency equipment and evacuation plans.
- f. Procedures and routes for emergency vehicular access/egress.
- g. Procedures for the evacuation of personnel from the Site.
- h. A listing of contact personnel with phone numbers that, at a minimum, includes fire officials, ambulance service, local, county, and state police, local hospitals, and a spill response team.
  - i. Routes to local hospitals, including written directions and a map that depicts the location of the Site relative to the hospital(s).

G. Borrow Source Evaluation:

- 1. Submit a borrow source evaluation for each material type that will be incorporated into the Work.
- 2. Refer to Specification Section 35 43 10 – Aquatic Filling for details on the required components of the borrow source evaluation submittal.

H. Utility Survey:

- 1. Contact Miss Utility to perform a utility markout.
- 2. Conduct a standard nautical chart review, and a coordinated review with the local utilities to check for the presence of buried utilities in the area where dredging Work will be performed. Confirm all suspected utility locations with the utility provider prior to beginning intrusive activities.
- 3. Provide copies of Miss Utility numbers/tickets to the COTR prior to beginning intrusive activities. The COTR will maintain copies on-Site in a clearance package.

1.7. DAILY REPORT

- A. Prepare a daily report summarizing the staff and equipment used, Work performed, and anticipated Work for the next Calendar Day. The Contractor's internal documentation used for this purpose may fulfill this requirement, subject to approval by the COTR. At a minimum, the daily report will include the following additional items:
  - 1. Summary of any safety related issues including a summary of the daily safety meeting and running total of safe hours worked.
  - 2. Dredge management system printouts with depths achieved and volumes removed/placed (the printout provided with the Daily Report can show cumulative progress).
  - 3. Description of any QC testing performed and the results.
  - 4. Approximate dredging and/or filling rate for the reporting period.



5. Estimate of the dredging rate and number of trucks needed for transportation to the disposal facility.
6. Status of all marine signaling equipment. Note the date and time that any irregularity in the system (e.g., inoperable lights, markers off station, markers removed) is discovered, and the data and time that irregularities are corrected.
7. Status of the turbidity curtains. Note any maintenance performed on the systems, unsatisfactory performance observed, and corrective actions taken.

B. Submit the daily report to the COTR by 10 AM of the next Business Day worked.

## PART 2 PRODUCTS

(Not Applicable)

## PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 30 00



## **SECTION 01 33 00 SUBMITTAL PROCEDURES**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This section summarizes the protocol and procedures for the preparation and delivery of submittals to the COTR.

#### **1.2. GENERAL REQUIREMENTS**

- A. Provide all submittals in electronic format directly to the COTR in accordance with the submittal schedule attached at the end of this Specification. The COTR reserves the right to request that any submittal be provided via paper copy.
- B. Include calculations, shop drawings, plans, reports, records, photographs, diagrams, and details with submittals, as needed, to facilitate the review and/or approval process.
- C. For all submittals requested via paper copy, provide five (5) copies to the COTR unless otherwise directed.
- D. If directed by the COTR, provide submittals electronically in the format requested (i.e. document file, drawing file, image file, etc.). For electronic drawings, submit AutoCAD 2012 (or later) file using the e-transmit feature (i.e. include external references, image files, color table file, font file, line file, etc.). Convert all AutoCAD add on data to AutoCAD format. Use descriptive layer titles (i.e. not numbers or internal use acronyms). Use extensive layer control and use line color by layer and line type by layer management. AutoCAD files of the Contract Drawings will be made available to the Contractor selected to perform the Work, upon request.
- E. Certifications must be signed by an officer or other individual authorized to sign on behalf of the entity. Submittals requiring preparation by an engineer or surveyor must be signed and sealed by a Professional Engineer/Surveyor licensed to practice engineering in the State of Virginia.
- F. Schedule submittals to expedite Work. Provide the COTR a minimum of 10 Business Days, excluding transmittal time, for review.

#### **1.3. SUBMITTAL SCHEDULE**

- A. Refer to Table 01 33 00-1 - Project Submittal Summary attached at the end of this Specification.
- B. Table 01 is to be considered as general guidance and not an exhaustive list of all submittals that may be required for the completion of the Work.

#### **1.4. SUBMITTAL PROCEDURES**



- A. Use the submittal numbers assigned in Table 01 33 00-1. For submittals not included in Table 01 33 00-1, use the next sequential number as the submittal number. For revised submittals, use original number and a sequential alphabetic suffix. For multiple submittals with the same submittal number, use the original number with a sequential numerical suffix.
- B. Use a cover form for each submittal. Include the Project name, Project number used by the City, date, submittal number, submittal description/title, submittal exclusions, and deviations from the Contract Documents (if any) on each cover form. The submittal cover form must be signed by an individual authorized to sign documents on behalf of the Contractor.
- C. Include drawings and details as appropriate.
- D. Use the same units of weights and measures on submittals that are used in the Contract Documents.
- E. Submit all supplier and Subcontractor submittals.
- F. Identify variations from the Contract Documents and product or system limitations that may be detrimental to successful performance of the completed Work.
- G. Prepare submittals that are complete and contain sufficient detail for review by the COTR.
- H. Resubmit submittals if requested by the COTR. When performing a submittal revision, identify all changes made since previous submission. For each re-submittal allow the same number of workdays required for review as the original submittal.
- I. Submittals not requested will not be recognized or processed.

#### 1.5. SUBMITTAL REGISTER

- A. Maintain a technical submittal register at the Site. Including the submittal number, description, date submitted, status, and date of approval/rejection.

#### 1.6. SUBMITTAL REVIEW

- A. Submittals will be reviewed solely for the purpose of determining whether the information contained in the submittal conforms to the design concept of the Contract Documents. Submittals will be returned with the following classifications:
  - 1. No Exceptions Taken: Work may proceed, no exceptions taken.
  - 2. Furnish as Corrected: Work may proceed subject to comments, resubmittal not required.
  - 3. Revise and Resubmit: Work may not proceed, resubmittal required for indicated items. Proceed with Work on other items subject to comments.
  - 4. Rejected: Work may not proceed, resubmittal required, submittal unresponsive



and/or not in conformance with Contract Documents.

- B. Any review performed by the City, Engineer, or COTR is for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Review is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions or quantities. Approval of a specific item does not constitute approval of an assembly of which the item is a component. The review and approval of the Contractor's submittals does not relieve the Contractor from complying with the requirements of the Contract Documents. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; fabrication processes and construction means, methods, techniques, sequences or procedures; coordination of the Work of all trades; and performing all Work in a safe and satisfactory manner.

#### 1.7. CERTIFICATES OF COMPLIANCE

- A. Submit any certificates required for demonstrating proof of compliance with the Contract Documents to the COTR as part of the submittal package.
- B. Certificates must be signed by an official authorized to sign on behalf of the manufacturing or testing company.
- C. For each certification, include the name and address of the Subcontractor, name of the requestor, the Project name and location, relevant test data (if required), and the dates of shipment and delivery.
- D. Certifications do not relieve the Contractor from the requirement for furnishing materials that comply with the requirements of the Contract Documents.

#### 1.8. INVOICES

- A. Submit monthly invoices in accordance with the provisions of the Terms and Conditions.
  - 1. Submit invoices on a form approved by the City with an updated schedule showing contract values, approved Change Orders, Work completed to date, current invoice and quantity amounts, and balance to complete for each bid item.
  - 2. Invoices must be reviewed and approved by the COTR prior to formal submission for payment.
  - 3. No payment will be made unless all the proper supporting documentation has been submitted and approved by the COTR.

### PART 2 PRODUCTS

(Not Applicable)

### PART 3 EXECUTION

(Not Applicable)



SUBMITTAL SUMMARY TABLE 01 33 00-1

Submittal Number	Description of Submittal	Submission Deadline	Referenced Specification Section
<b>PRE-MOBILIZATION</b>			
1	Critical Path Method Project Schedule	At first meeting, updated weekly	01 30 00
2	Pre-Construction Survey Results	1 week prior to mobilization	01 30 00
3	Disposal Facility Acceptance Letter(s)	2 weeks after award	02 61 00
4	Contractor Health and Safety Plan	2 weeks after award	01 30 00
5	Remedial Action Contingency Plan	2 weeks after award	01 30 00
6	Borrow Source Evaluation	2 weeks prior to importing material to the Site	35 43 10
7	Utility Survey	1 week prior to mobilization	01 30 00
8	Wastewater Treatment System	1 week prior to mobilization	44 01 40
9	Permits	Prior to submittal	01 30 00
10	Final Executed Permits	Upon receipt	01 30 00
<b>REMEDIATION</b>			
11	Initial Bathymetric Survey	Upon receipt	02 21 00
12	Daily Report	10:00 AM the next Business Day	01 30 00
13	Dredge Extents Bathymetric Survey	Prior to placement of fill	35 20 23
14	Invoices	Monthly	01 33 00
<b>PROJECT CLOSEOUT</b>			
15	Substantial Completion	When Work is at Substantial Completion	01 77 00
16	Record Drawings	Prior to application for Final Completion	01 77 00
17	Permit Closeout	Prior to application for Final Completion	01 77 00
18	Final Completion	Work is complete	01 77 00
19	Final Invoice	After Final Completion	01 77 00

END OF SECTION 01 33 00



## **SECTION 01 35 00 HEALTH AND SAFETY REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required to conform to all Federal, State, and local health and safety requirements during the performance of the Work.

#### **1.2. SUBMITTALS**

- A. Prior to mobilization, submit the Contractor's Health and Safety Plan, and documentation of OSHA training and enrollment in medical monitoring for Site personnel as described in Section 3.1 – Work Qualifications of this Specification.

#### **1.3. REFERENCES**

- A. Applicable regulations and publications include, but are not limited to, the following:
  - 1. ACGIH, Threshold Limit Values and Biological Exposure Indices (most recent version).
  - 2. ANSI, Emergency Eyewash and Shower Equipment, Z358.1, 1981.
  - 3. ANSI, Practice for Occupational and Educational Eye and Face Protection, Z87.1, 1979.
  - 4. ANSI, Practices for Respiratory Protection, Z88.2, most recent version.
  - 5. ANSI, Protective Footwear, Z41.1, 1983.
  - 6. ANSI, Respirator Use Physical Qualification for Personnel, Z88.6, 1984.
  - 7. DHHS, "Manual of Analytical Methods," 3rd edition Volumes I and II, DHHS (NIOSH) Publication 84-100.
  - 8. DOT Standards and Regulations, 49 CFR 171, 49 CFR 172 and 49 CFR 214.
  - 9. NESHAP (40 CFR 61 Subpart M), National Emission Standards for Hazardous Air Pollutants: Asbestos.
  - 10. NFPA, Flammable and Combustible Liquids Code, NFPA 30, most recent revision.
  - 11. NIOSH Pocket Guide to Chemical Hazards, DHHS/PHS/CDC/NIOSH, August, 2006 or most recent.
  - 12. NIOSH/OSHA/USCG/USEPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS/PHS/CDC/NIOSH, October 1985.
  - 13. OSHA, Title 29 CFR Part 1910, Occupational Safety and Health Standards, in particular 1910.134, Respiratory Protection; Title 29 CFR Part 1926, Safety and



Health Regulations for Construction Sites, in particular 1926.1101, Asbestos, and 1926.62, Lead.

14. OSHA, Title 49 CFR Part 214, Roadway Workplace Safety.
15. USEPA, Health and Safety Requirements for Personnel Engaged in Field Activities, USEPA Order No. 14402.
16. USEPA, Standard Operating Safety Guidelines, November 1984.

- B. Except to the extent that more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations, and standards have the same force and effect and are made a part of the Contract Documents by reference as if copied directly into the Contract Documents, or as if published copies are bound herewith.
- C. Where two or more regulations/documents conflict, the one(s) offering the greatest degree of protection shall apply.

#### 1.4. CONTRACTOR'S RESPONSIBILITY FOR HEALTH AND SAFETY

- A. Comply with any and all applicable state, federal, and local ordinances, laws and regulations.
- B. The Contractor is responsible for the Health and Safety their employees, its Subcontractors, suppliers, agents, inspectors, visitors, the general public, and any Others associated with, or interacting with Contractor who provides labor, goods, or other services on the Site.
- C. The Contractor is responsible for emergency response planning and notification and for actual response to any and all emergencies that may occur during the course of the Work, including emergencies that may occur when the Contractor is not present at the Site.
- D. The Contractor is responsible for communicating daily with the COTR regarding Health and Safety issues for the safe conduct of the COTR's duties, but such communication shall not imply any duty or responsibility on the part of the COTR with regard to Health and Safety of Contractor's employees, its Subcontractors, suppliers, the general public, or Others. The COTR's responsibility and duty with regard to Health and Safety shall be limited to their employees. Communicate Health and Safety issues accurately and in a timely manner to allow the COTR and take appropriate actions to protect the COTR's employees and the Owner's employees.
- E. Designate a Site Safety and Health Officer (SSHO) who, at a minimum, has at least 1 year of experience as an SSHO on an uncontrolled hazardous waste site, is 40-hour OSHA Hazardous Waste Operations trained, and 8-hour OSHA Supervisor trained.
- F. The SSHO shall enforce the health and safety requirements for all Contractor personnel on-Site at all times. The SSHO shall ensure that all Contractor personnel, Subcontractor personnel, and Contractor visitors follow the Contractor's site Health and Safety Plan (HASP), including wearing the designated level of Personal Protective Equipment (PPE).



If the SSHO elects to require a higher level of protection than that specified in the GEI HASP, the extra costs associated with such higher level shall be borne by Contractor, unless such extra costs are approved in advance in writing by the COTR.

- G. Prior to mobilization and continually through the duration of the Work, the SSHO shall inspect the Site and document area-specific and worker-specific protection requirements.
- H. After mobilization, the SSHO shall monitor Work activities and document the need for additional worker protection, as required, based on the Work being performed and action levels specified in the Contractor HASP.
- I. The SSHO shall verify that all activities are performed in accordance with the HASP and all federal, state, local, and Health and Safety standards, Laws and Regulations, and guidelines.
- J. In the event of a health or safety risk, as determined by the SSHO, other Contractor personnel, or by the COTR, stop Work until a method for handling the risk has been determined and implemented in consultation with the COTR. Report any health or safety risk resulting in a Work stoppage to the COTR.
- K. The Contractor is responsible for implementing a behavior-based safety process and providing site training, observation, and feedback for Contractor personnel employed at the Site.

The Engineer will provide the Contractor with a copy of the Engineer HASP as a reference. The Contractor is responsible for preparing their own HASP under which their employees will perform the Work.

#### 1.5. CONTRACTOR'S HEALTH AND SAFETY PLAN

- A. Prepare and submit a Site-specific Health and Safety Plan (HASP) to the COTR prior to the start of the Work. Follow all applicable local, state, and federal Health and Safety standards, Laws and Regulations, and guidelines implemented through, but not limited to, the OSHA, NIOSH, ACGIH, and USEPA. Where these references are in conflict, follow the more stringent requirement. At a minimum, address the following topics in the Contractor HASP:
  - 1. Names of key personnel and alternates responsible for Health and Safety, including a Contractor Health and Safety Representative and SSHO.
  - 2. A Health and Safety risk or JSA associated with each portion of the Work (i.e., list potential chemical and physical hazards), including JSAs for material handling, separation, sizing, stockpiling, loading, transportation, and disposal.
  - 3. Documentation of employee and Subcontractor training and medical certifications required by 29 CFR 1910.120, as described in Part 3 of this Section.
  - 4. PPE to be used for each of the tasks and operations being conducted, as required by the PPE program in 29 CFR 1910.120, 29 CFR Subpart I, and 29 CFR 1926.



5. Medical surveillance requirements in accordance with the program in 29 CFR 1910.120.
6. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used by the Contractor, including methods of maintenance and calibration of monitoring and sampling equipment.
7. Corrective actions and upgrading of PPE based on monitoring of air, personnel, and environmental sampling, with specific Action Levels identified.
8. Site control measures in accordance with the control program required in 29 CFR 1910.120 and 29 CFR 1926.
9. Decontamination procedures in accordance with 29 CFR 1910.120 and Specifications Section 025100.
10. If confined space entry is required, include confined space entry procedures in accordance with 29 CFR 1910.146, and a list of all anticipated confined space entries required by the Contractor in the course of the Work.
11. A list of Health and Safety and emergency equipment available on the Site.
12. A description of engineering controls used to reduce the hazards of equipment operation and exposure to hazardous chemicals.
13. An air monitoring plan describing the method, type, frequency, locations of air monitoring, laboratories, and type of analysis to be performed at the Work area for the purpose of employee safety.
14. Heat stress program consistent with the references provided in the Engineer provided HASP.
15. Cold stress program consistent with the references provided in the Engineer provided HASP.
16. Lockout/Tagout procedures where the sudden start up or release of stored energy could cause injury to personnel.

#### 1.6. NOTIFICATIONS

- A. Immediately verbally report to the COTR and the City the occurrence of any and all Health and Safety incidents.
- B. Fully and immediately investigate any such incident or near-miss and conduct a root cause analysis. Submit to the COTR the Contractor's written corrective action plan within 1 day of the incident occurring.
- C. Notify the COTR in writing at least 5 days prior to bringing any hazardous material, equipment, or process to the Site. Provide the COTR with an SDS for all chemicals brought on to the Site.



- D. Immediately notify the COTR in writing of any hazard the Contractor discovers or observes on the Site, and the corrective measures planned or taken to eliminate or minimize the hazard. Hazard reporting will be completed as a near miss report.

## PART 2 PRODUCTS

### 2.1. EQUIPMENT AND FACILITIES

- A. Provide all equipment, temporary facilities, and personnel required to perform activities on Site safely in accordance with all applicable laws and regulations and the Contractor's HASP.

### 2.2. PERSONAL PROTECTIVE EQUIPMENT

- A. The appropriate level of PPE is to be determined by the Contractor for the specific tasks as described in the Contractor's HASP. If hazards are identified that require a level of protection greater than Level C (defined in paragraph D below), Work shall be suspended and the COTR notified. The Contractor's SSHO, in consultation with the COTR, will determine what corrective actions are required prior to restarting Work. Determine and document the appropriateness of the suggested minimum PPE requirements for Contractor's personnel and Others at the Site.
- B. Furnish and maintain materials and equipment for the Health and Safety of Contractor employees, its Subcontractors, Suppliers, and visitor personnel. Provide all required Health and Safety equipment, first aid equipment, tools, monitoring equipment, PPE, and ancillary equipment and methods required to ensure workers' Health and Safety and to comply with the Contractor's HASP.
- C. Level D protection will be required at all times for all personnel and visitors on the Site, except in Support Zone areas. Level D PPE consists of:
  - 1. Hard hat.
  - 2. Steel-toed boots.
  - 3. Safety glasses with permanent side shields.
  - 4. Work clothes (long pants, shirts with sleeves).
  - 5. Work gloves.
  - 6. High visibility reflective safety vests.
  - 7. Hearing protection (as needed to prevent exposure exceeding 85 dB level).
  - 8. U.S. Coast Guard approved Personal Flotation Devices for personnel working on or near the water.
- D. If additional protection consisting of Level C PPE is required during the Work, Level C PPE shall include protection from dust particulates and entrained heavy metals and consist of Level D protection with the following additions:



1. Air purifying respirator, half-face or full-face (depending on required protection factor) with high efficiency particulate air cartridges meeting NIOSH Specifications. The presence of chemical vapors during certain activities (e.g. painting) could trigger the need for additional respiratory protection.
  2. Disposable poly-coated chemically protective coveralls.
  3. Disposable chemically resistant outer gloves (nitrile).
  4. Disposable chemically resistant inner gloves (nitrile).
  5. Chemically resistant, steel-toed, and steel-shanked boots (polyvinyl chloride, neoprene, or nitrile), or outer booties.
- E. In most cases, Level C will be the maximum allowable level of PPE. Level B may be allowed provided that personnel are properly trained and certified, and exposure levels are below immediately dangerous to life and health (IDLH) conditions.
- F. In cases where the COTR's client requires additional PPE, the COTR will notify the Contractor of these additional requirements in advance of mobilization so that Contractor may obtain the necessary equipment.

## PART 3 EXECUTION

### 3.1. WORKER QUALIFICATION

- A. Provide the following training to workers, except those who will be restricted to the Support Zone.
1. Initial 40-hour OSHA hazardous waste Health and Safety training and current annual 8-hour refresher training.
  2. Eight-hour OSHA hazardous waste supervisory training (required for the Contractor's Superintendent and SSHO).
  3. Enrollment in a medical monitoring program, with clearance within the previous 12 months from a licensed physician allowing the worker to participate in field activities and use respiratory protective equipment.
  4. Current respiratory fit testing certification for workers who may be required to work in Level C PPE.
  5. Current cardiopulmonary resuscitation (CPR) and first aid certification for at least two workers assigned to Work on the site.
  6. Confined Space Entry Training for workers entering confined spaces.
  7. For any worker who is assigned the role of a "competent person," provide documentation of sufficient and relevant training and experience to perform the assigned duties and responsibilities of that role. As defined in 29 CFR 1926.31, the competent person shall be "one who is capable of identifying existing and



predictable hazards, and who has authority to take prompt corrective measures to eliminate them.” Relevant training and experience shall be in the same type of Project activities included in the Work under this Contract.

### 3.2. WORK PLANNING AND MEETINGS

- A. Conduct a daily health and safety meeting, prior to beginning Work for that day, to address health and safety issues, changing conditions, activities, and personnel. All Contractor and Subcontractor employees working on the Site on that day must attend the meeting. Document all meetings and have attendees sign a form acknowledging their presence at the meeting. Include as part of the daily meeting, an evaluation of the Work to be conducted, the hazards associated with the work, and the control measures being used to reduce exposure.
- B. Contractor personnel who are not in attendance for the daily Health and Safety must be briefed on the meeting notes prior to commencing any Work related activities.
- C. Hold and document additional safety meetings at the start of each major task, and whenever site conditions change such that it could potentially affect worker safety. Any major task undertaken requires the completion of a JSA as described in this Section.

### 3.3. MONITORING

- A. Perform heat exposure and cold exposure monitoring activities as required by weather conditions.
- B. Perform all work zone air monitoring activities described in the Contractor’s HASP required to provide health and safety protection to the Contractor and Subcontractor personnel.
- C. Pay all costs associated with sampling and analysis to comply with OSHA regulations for monitoring air within work zones.

### 3.4. EVALUATION OF PERFORMANCE

- A. Conduct internal safety audits on Subcontract and sub-subcontract Work zones in accordance with the Contractor’s HASP. The focus of these routine audits will focus on compliance with OSHA, and local, safety regulations.
- B. Conduct routine behavioral observations and provide immediate feedback during Work activities to promote safe behavior of Contractor and Subcontractor employees.

END OF SECTION 01 35 00



## **SECTION 01 41 00 REGULATORY REQUIREMENTS - PERMITS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This Section establishes responsibility for obtaining Project permits between the Engineer, the City, and the Contractor.

#### **1.2. CITY APPROVALS**

- A. The City will obtain the following Project permits:

- 1. Approvals from the Virginia DEQ.
- 2. Nationwide 38 Permit from the USACE.
- 3. Parks Department Permits.

#### **1.3. CONTRACTOR PERMITS**

- A. Obtain the following Project permits/acceptances:

- 1. Acceptances of the sediments at the approved disposal facility selected for use by the Contractor.
- 2. Local construction permits/notifications, as needed.
- 3. Permits required for any off-Site parking that is negotiated between the Contractor and the City, and/or private parking facilities, as needed.
- 4. Temporary road encroachment permit.
- 5. Publically Owner Treatment Works (POTW) discharge permit.
- 6. Any other permits required to complete the Work.

- B. This Section does not describe all permits required for performance of the Work. Any permits not identified in this Section, or elsewhere in the Contract Documents, are the responsibility of Contractor.

- C. Regardless of who is responsible for obtaining a permit, the Contractor is responsible for performing in accordance with the terms and conditions of all permits.

- D. Provide any technical and equipment related data required by the City.

#### **1.4. COORDINATION/ASSISTANCE**

- A. The COTR will coordinate delivery of Contractor submittals to regulatory agencies, as may be required.



- B. Provide all data requested by the COTR to support permit applications. When necessary, the COTR may provide data summaries or other Project information in support of Contractor permit submittals.
- C. Any coordination and/or assistance between the Contractor and the COTR is provided in the interest of expediting the Project. The provision of coordination and/or assistance does not relieve the Contractor of their obligations to obtain, or abide by, a permit.

## PART 2 PRODUCTS

(Not Applicable)

## PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 41 00



## **SECTION 01 50 00**

### **TEMPORARY FACILITIES AND CONTROLS**

#### **PART 1 GENERAL**

##### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, equipment, supplies, laboratory testing, materials, and performing all operations required for providing temporary facilities and controls during the performance of the Work.

##### **1.2. WORK ZONES**

- A. Establish a Secured Zone, Support Zone, Exclusion Zone, and Decontamination Zone, as defined herein.
  - 1. Lay out the Work Zones and establish boundaries, barriers, facilities, and controls to ensure that all personnel and equipment exiting the Exclusion Zone pass through the Contamination Reduction Zone before entering the Support Zone and before exiting the Site.
  - 2. Furnish, install, and maintain in good condition, orange plastic mesh fencing secured to metal posts to delineate the boundaries between Work Zones, including the Exclusion Zone, Contamination Reduction Zone, and Support Zone. Install orange plastic mesh fencing at the entrance of the Exclusion Zone for a clear demarcation for Site workers.
- B. Establish a general Secured Zone that excludes unauthorized personnel from entering the Site.
  - 1. The COTR, Engineer, and the City shall be allowed free access to the Secured Zone 24 hours per day, subject to appropriate safety precautions. Providing the COTR and the City with access to the Secured Zone does not in any way relieve that Contractor of the responsibility for maintaining Site security during the performance of the Work.
  - 2. Provide the COTR with three copies of the key(s) that will allow access to the Secured Zone.
  - 3. Maintain a log sheet on which all Contractor personnel and visitors must sign in and out upon entering or leaving the Secured Zone.
  - 4. The Contractor is solely responsible for the security and safety of equipment, facilities, personnel, and materials within the Secured Zone.
- C. Establish a Support Zone for field offices, storage, sanitary facilities, hand-washing facilities, and non-construction vehicle parking.
  - 1. The Support Zone shall be an area that is free of physical and chemical hazards.



2. Maintain the Support Zone in a safe, clean, orderly, and sanitary manner at all times.
- D. Establish the limits of the Exclusion Zone using the following criteria in addition to any other criteria that may be deemed necessary by the COTR.
  1. All stockpile areas.
  2. All areas where impacted materials are present at the ground surface.
  3. OSHA Regulations and all other applicable Laws and Regulations.
- E. Establish a Contamination Reduction Zone between the Support Zone and the Exclusion Zone.
  1. Provide suitable facilities for personnel decontamination in the Contamination Reduction Zone, including an emergency eyewash.
  2. Construct a vehicle and equipment decontamination pad that allows for the capture of solid residuals and evaporation/infiltration of liquid residuals generated during decontamination of construction vehicles and trucks bound for off-Site disposal facilities.
  3. The vehicle and equipment decontamination facility will be sufficiently sized to ensure the largest piece of equipment can be adequately decontaminated.
  4. If requested by the COTR, provide splash protection around the vehicle decontamination facility. Design splash protection to minimize potential contamination from splatter and mist during the vehicle and equipment decontamination process. If directed, furnish splash protection that is stable and capable of being dismantled in the event of high winds.
  5. Provide a method for the transport of wastewater generated during decontamination procedures to be containerized.

### 1.3. THIRD PARTY OFFLOADING AREAS

- A. If the Contractor is making use of a third party offloading area (e.g. a pre-approved port facility), the Contractor must abide by all facility rules and regulations put in place by the facility owner while using the facility.
- B. The pre-approved ports listed in the Contract Documents do not imply an endorsement of the facility or their owners by the City, the Engineer, or the COTR and neither the City, the Engineer, or the COTR will be liable for any disputes, reduction in production rates, or other issues related to completion of the Work that may arise out of the use of these pre-approved facilities.

## PART 2 PRODUCTS

### 2.1. MATERIALS AND FACILITIES

#### Temporary Facilities And Controls

01 50 00-2



- A. All furnished materials must be suitable for their intended use and conform to all applicable codes and standards.
- B. Provide separate, dedicated, temporary on-Site office space and two work stations for the COTR. At a minimum, provide a space that includes electricity, heat, and internet access. Equip each work station with a desk and chair.
- C. Furnish at least once temporary office space that may be used to facilitate weekly construction meetings.
- D. Provide two way radios with spare batteries for the exclusive use of the COTR. The radios provided to the COTR must be able to receive and send on all frequencies that will be used by the Contractor during the performance of the Work.
- E. Provide and maintain a sufficient supply of materials/equipment required to implement decontamination procedures, including, but not limited to, the following items:
  - 1. Plastic trash barrels.
  - 2. Liners for trash barrels.
  - 3. Wash basins.
  - 4. Alconox™ or approved equivalent detergent concentrate.
  - 5. Hand pump sprayers.
  - 6. Long handled soft bristle brushes.
  - 7. Large sponges.
  - 8. Cleaning wipes for respirators.
  - 9. Bench or stool(s).
  - 10. Stepladder(s).
  - 11. Steam generator.
  - 12. Liquid detergent and paper towels.
  - 13. Plastic trash bags.
  - 14. Supplies and equipment to construct the decontamination pad.
- F. Install a 6 foot tall temporary chain link fence and gate (with privacy screens and locks) as shown on the Contract Drawings.
  - 1. If needed, provide additional reinforcement to prevent damage to the fence during periods of high wind from the addition of the privacy fabric. Promptly repair any damage to the fence and/or privacy fabric.



2. Furnish, install, and maintain all other proposed temporary fencing, gates, and barriers around impacted areas as required by the Contract Documents, and as may be needed to complete the Work.
  3. Furnish and post signs at every entrance and gate, and at not less than every 50 feet along the fence warning the general public that the Site contains physical and chemical hazards, and that access is forbidden to unauthorized persons.
  4. The fence must be at least 6 feet in height and use post block anchor points. Do not drive in the temporary fence posts.
- G. Provide suitably enclosed chemical or self- contained toilets for the use of all Site workers. Locate toilets the on-Site in areas that are secluded from observation insofar as possible.
- H. Furnish and maintain a safe drinking water supply readily available to all workers.

## 2.2. CONSTRUCTION MANAGER WATERCRAFT

- A. Furnish a boat, fuel, and coxswain for use by the COTR during the performance of the Work. The boat may have other duties but must be made available to the COTR within 5 minutes of a request for use of the vessel.
- B. Furnish the means to safely access and egress the boat from the site during the performance of the Work. Alternatively, a docking space may be rented from a nearby marina. The location of any rented docking space, if used, must be approved by the COTR prior to use.
- C. The boat must be capable of safe operation while transporting the COTR and visiting agency personnel during reasonably expected weather conditions, and meet the following minimum requirements:
  1. Flat bottom.
  2. Fiberglass hull.
  3. Minimum 30 horsepower, electric start, outboard motor.
- D. The boat must be capable of safely traversing the Site to inspect the sediment curtains (including the ability transit over or through the curtain/absorbent boom), dredging equipment, and aids to navigation.
- E. It is preferred, but not required, that the construction manager watercraft be equipped with an enclosed cabin.

## 2.3. ON-SITE UTILITIES

- A. There are currently no on-Site utilities available for use by the selected Contractor.
- B. Make arrangements for the necessary temporary utility connections needed to complete the Work.



- C. Pay all costs associated with all temporary utilities used during the performance of the Work.

## PART 3 EXECUTION

### 3.1. GENERAL

- A. Operate and maintain all equipment and systems to ensure that the temporary facilities, controls, utilities, and other services are provided without disruption.
- B. Design, furnish, install, and maintain all temporary Site facilities and controls required for the performance of the Work.
- C. Provide and maintain all temporary environmental controls, as necessary for the protection of the environment, throughout the performance of the Work.
- D. Provide and maintain proper barricades and warning signs at all closures, holes, hazards, and equipment areas.
- E. Ensure that all Subcontractors comply with the provisions of this Specification.

### 3.2. SANITARY FACILITIES

- A. Empty the sanitary facilities before the capacity is exceeded, or on a weekly basis, whichever occurs first. Clean sanitation facilities concurrently with emptying.
- B. Clean and restock hand wash stations as needed.

### 3.3. TEMPORARY UTILITIES

- A. Provide suitable decontamination water for the duration of the Project.
- B. Supply potable drinking water for on-Site personnel.
- C. Provide all temporary utility services in accordance with this Specification for the duration of the Project. This includes, but is not limited to, installation, operation, maintenance, and removal of all equipment and/or systems required to ensure uninterrupted service and paying all fees associated with installation, connection, service, and shut-off.

### 3.4. PERSONNEL DECONTAMINATION

- A. Comply with all requirements of the Contractor Health and Safety Plan.
- B. Provide the means for the COTR and visiting regulatory agency representatives to comply with the Contractor Health and Safety Plan.
- C. Provide a decontamination station where personnel can drop equipment and remove personal protective equipment (PPE).
  - 1. Equip the decontamination station with basins for water and detergent, and trash bags or cans for containing disposable PPE and other discarded materials.



2. Supply a sink as a secondary means of personal hygiene for personnel.

### 3.5. EQUIPMENT DECONTAMINATION

- A. Install decontamination equipment in accordance with the Contract Drawings.
  1. Locate and operate a decontamination pad at any point that equipment leaves the Site.
  2. Provide a decontamination pad of sufficient size to ensure that the largest piece of equipment can be adequately decontaminated.
- B. Remove heavy contamination using a broom and/or brushes within the dredge area prior to movement to the decontamination pad.
- C. Perform heavy equipment decontamination within the limits of the decontamination pad.
- D. Pressure wash heavy equipment before it departs the Site, as needed.
- E. Decontaminate any equipment utilized to excavate impacted materials prior to backfilling.
- F. Collect and pump wastewater from equipment decontamination into the wastewater disposal system.
- G. Collect and remove soils from the decontamination pad and bulk with excavated materials for disposal.

### 3.6. SITE SECURITY

- A. The Work will be completed in the City of Alexandria, VA. Take every security precaution necessary to prevent any unauthorized access to the work area, and to control construction traffic to and from the Site.
- B. The Contractor may, at their own discretion, provide manned-overnight security personnel at no additional cost to the City.
- C. Security personnel employed during non-working hours must, at a minimum, meet the following requirements:
  1. Be literate in the English language.
  2. Briefed on Site hazards.
  3. At no time have access to or the capacity to use firearms, restraint tools, or any weaponry associated with criminal investigation.
  4. Have access to a telephone.
- D. Personnel assigned to perform Site security are not required to adhere to the training, certification, and medical monitoring program defined in the site specific Health and Safety Plan, however, security personnel must be briefed on all hazards present and



instructed not to enter any exclusion zones and to avoid any potential exposure to contaminated wastes.

- E. Establish written Site security procedures that, at a minimum, include:
  - 1. Roles and responsibilities of personnel involved with Site Security.
  - 2. Description of proposed daily security operations.
  - 3. Method and frequency for conducting security checks.
  - 4. Sign in/sign out procedures.
  - 5. Location of security station.
  - 6. Description of how a breach of security will be handled. A breach of security includes, but not be limited to, unauthorized personnel located on the Site working area, unauthorized personnel attempting to gain access to the Site working area, broken fences and unlocked gates, and unauthorized personnel in the hazardous work zones.
  - 7. Communications.
- F. List of personnel to be contacted in case of emergency.

### 3.7. DUST, ODOR, and VAPOR CONTROLS

- A. Apply odor-suppressing foam to the dredged material when stockpiled, during dredging and loading operations, or at any other time and location as directed by the COTR.
- B. Apply water to control the generation of dust on the Site as needed or as may be directed by the COTR.
- C. Provide the labor, equipment, and materials required to apply dust controls and/or odor suppressant foam to all exposed dredged material, including stockpiles, within 5 minutes of the start of intrusive activities, or when directed by the COTR. No separate payment will be made for the supplying and operation of dust/odor control equipment. Payment for odor suppression materials will be as per the unit bid price. Payment for the application of water for the control of dust is to be included in the Contractors base Bid. Failure to apply dust/odor suppression materials within the specified time will result in all Work being suspended until such time as the COTR feels the request for controls has been fully satisfied. No additional payment for such downtime shall be due to the Contractor.
- D. Maintain sufficient materials on hand to apply dust and odor controls, as directed, during the entire period when intrusive work is being performed.
- E. Cover all exposed stockpiles with a secured polyethylene tarp if left untouched for longer than 2 hours. Provide an equivalent covering for all dredged material stockpiles left overnight.



- F. Provide dust control at the approved offload point using water trucks, hoses, or engineered dust suppression materials, as needed.
- G. If the generation of dust and/or odors becomes a chronic nuisance to the surrounding receptors the COTR may direct the Contractor to alter the means and methods of the Work to address the dust/odor issue. Requested changes to the means and methods to address chronic dust/odor concerns will be made by the Contractor at no additional cost to the City.

END OF SECTION 01 50 00



## **SECTION 01 77 00 CLOSEOUT PROCEDURES**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. Closeout procedures covers the administrative and technical requirements for final cleaning, inspection, Project as-built documents, system demonstrations and adjustments, warranties, bonds, final payment, and other procedures for Project closeout in accordance with the Contract Documents.

#### **1.2. CLOSEOUT PROCEDURES AND REQUIRED SUBMITTALS**

- A. Refer to the Construction Terms and Conditions for details on the procedures to be followed when the Contractor believes the Work to be at Substantial Completion.
- B. For this Project, Substantial Completion will be defined as all dredging and capping Work complete, all MGP impacted material, debris, and wastewater transferred off-Site, and stockpile pads and water containerization equipment removed. The COTR has sole and final discretion for determining whether or not the Work has progressed to the point of Substantial Completion.
- C. Record Drawings:
  - 1. Submit record surveys in electronic format (.dwg AutoCAD file), and provide two (2) hard copies to the COTR that have been signed and sealed by a surveyor licensed to practice in the State of Virginia. At a minimum, record drawings are to include:
    - a. Encountered structures left in place.
    - b. Encountered pipes that were removed, not removed, and the terminal ends of cut/capped pipes.
    - c. Utility locations, elevations, and inverts.
    - d. Bottom of remedial dredging grade.
    - e. Backfill grades.
    - f. Aerial extent and elevations of the top of the reactive cap materials.
    - g. Final Grade/topography.
    - h. Benchmark coordinates and elevation.
  - 2. Final quantities that were designated to be determined by survey are to be included on the record drawings. The applicable record drawing must clearly indicate the pay item and final total quantity of measured units.



3. Provide the COTR with an electronic version of the Record Drawing in a color-PDF format that bears the seal of the Project surveyor who oversaw the preparation of the Record Drawings.
- D. Provide copies of all Project records including, but not limited to, the following:
  1. Manifests and bills of lading (provide to COTR upon receipt).
  2. Weight tickets (provide to COTR upon receipt).
  3. Testing results.
  4. Health and Safety reports.
  5. Copies of permits.
- E. Permit Closeout:
  1. Submit written confirmation that all permits have been closed with their governing authority and that any and all remaining fees (if applicable) have been paid in full.
- F. Final Completion and Final Payment:
  1. Refer to the Construction Terms and Conditions for details on the procedures to be followed for Final Completion and Final Payment.

## PART 2 MATERIALS

(Not Applicable)

## PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 77 00



## **SECTION 02 21 00 SURVEYS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for performing surveying Work.
- B. This section details the surveying requirements for the performance of the Work.

#### **1.2. QUALIFICATIONS**

- A. Subcontract with a Professional Surveyor licensed in the State of Virginia to serve as the independent surveyor for the Project.
- B. The selected surveyor shall have served in a similar role on at least two previous Projects with a dredging component of a similar or greater size.
- C. The selected surveyor may not be replaced unless the Contractor submits a written request to the COTR for approval that details the reason(s) for the requested change and includes any noted deficiencies.

#### **1.3. REFERENCE POINTS**

- A. Establish horizontal control points and benchmarks, as needed. Protect the reference points from disturbance during performance of the Work.
- B. When laying out and controlling the performance of the Work, use horizontal and vertical datum's that are consistent with those used in the Contract Drawings.

#### **1.4. BATHYMETRIC SURVEYS**

- A. Prepare a pre-dredging bathymetric survey, which has been performed by the Project surveyor, prior to the start of dredging Work. Submit the pre-dredging bathymetric survey to the COTR for review and approval as part of the pre-mobilization submittals.
- B. Provide a post-dredging bathymetric survey, which has been performed by the Project surveyor, at the conclusion of the dredging Work. Submit the post-dredging bathymetric survey to the COTR for review and approval before beginning the aquatic filling Work.
- C. Perform a post aquatic filling bathymetric survey, using the Project surveyor, after substantial completion of the Work. Furnish the results of this survey to the COTR for review and approval with the closeout documents.

### **PART 2 PRODUCTS**

(Not Applicable)

### **PART 3 EXECUTION**

#### **3.1. BATHYMETRIC SURVEY PERFORMANCE**

Surveys

02 21 00-1



- A. Perform the bathymetric surveying using a single beam survey system with real time kinematic global positioning that corrects for tide and boat movement, to the following measurement tolerances:
  - 1. Horizontal: +/- 0.1 feet.
  - 2. Vertical: +/- 0.1 feet.
- B. Perform the survey in parallel lines with a maximum interval spacing of 5 or 10 feet with perpendicular lines spaced at 5 or 10 feet.
- C. Use a sounding pole with a leveling rod and bottom plate, or a lead line to calibrate echo-sounding readings before and after each session.

END OF SECTION 02 21 00



## **SECTION 02 61 00**

### **REMOVAL AND DISPOSAL OF CONTAMINATED MATERIALS**

#### **PART 1 GENERAL**

##### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the proper management, off-Site transportation, and disposal of waste materials and waste liquids generated during performance of the Remedial Work.
- B. Contaminated Material generated during the Work is classified into two categories:
  - 1. Remediation Waste – Media or materials containing Site-related contaminants, which includes, but is not limited to, the following:
    - a. Dredged sediment.
    - b. Debris.
    - c. Spent oil absorbent booms.
    - d. Turbidity curtains (prior to decontamination).
    - e. Collected liquid effluent.
    - f. Decontamination water.
    - g. Water treatment system residuals (e.g., filter cake).
  - 2. Construction-related Contaminated Waste – Waste media or materials generated during the Work which do not contain Site-related contaminants and are unsuitable for future use (e.g., cement batch plant wastes, unused water treatment or decontamination reagents, or spent lubricants or solvents). This category excludes construction-related wastes suitable for disposal as routine municipal solid waste.

##### **1.2. GENERAL**

- A. This section includes transportation of debris, dredged materials, miscellaneous debris, and dredged sediments to the specified disposal facilities. The Contractor is responsible for the cost of all material transportation. It is the responsibility of the Contractor to use equipment and personnel capable of navigating the local traffic patterns while maintaining minimum daily production, as required, to meet the Project milestones, if transportation via land is used. The Contractor is responsible for all delays caused as a result of trucks not following approved traffic routes, inadequate scheduling of trucks, causing traffic delays, or from using equipment that cannot safely navigate the local roadways.
- B. The Contractor is solely responsible for proper vehicles loading. Ensure the vehicle contents are properly contained and secured in the vehicle, including the proper lining



and covering of loads. All vehicles leaving the Site must abide by all load and weight limits. All fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles are the responsibility of the Contractor.

- C. For the duration of the Work, maintain copies on-Site of all documents related to the off-Site shipment of Contaminated Material.

### 1.3. CONTRACTORS RESPONSIBILITIES

- A. Segregate and manage Contaminated Material at the Work Site in accordance with all applicable laws and regulations, including but not limited to those listed in the References section of this Specification.
- B. If an alternate off-site disposal facility has been put forward by the Bidder as a value added proposal, and consequently approved by the City, perform any additional analytical testing that may be required to dispose of Remediation Waste at the City approved alternate off-site disposal facility.
- C. Perform all analytical testing required to characterize Construction-related Contaminated Waste for off-Site disposal or recycling.
- D. Propose off-Site disposal or recycling facilities for Remediation Waste requiring transport off-Site, including dredged debris, decontamination residuals, and water treatment system residuals.
- E. Prepare all documentation and permits required for off-Site disposal or recycling of Contaminated Material.
- F. The Contractor is responsible for the acceptance of Contaminated Material at the facilities. In the event that the identified and approved facilities cease to accept the Contaminated Material, the Contractor shall identify alternate facilities, and make arrangements with such facilities to accept material from the Work Site with no change in the unit price submitted in the Contractor's Bid for this project. Alternate facilities are subject to review and approval by the City.
- G. In the event that an alternate facility is needed to accept Contaminated Material, the Contractor will supply a written submission to the COTR on the material type, amount, location, and reason the approved facility ceased to accept the material. The City must approve of all off-Site disposal facilities used during the performance of the Work. Disapproval by the City of a Contractor selected off-Site disposal facility will not be considered as grounds for a Change Order.

### 1.4. CITY RESPONSIBILITIES

- A. Approve off-Site disposal/recycling facilities.
- B. Act as generator for all Remediation Waste streams transported off-Site. The Owner will sign all manifests/bills of lading as required for Remediation Waste transported off-Site.



## 1.5. SUBMITTALS

- A. Within 2 days of transporting materials off-Site, submit copies of completed manifests/bills of lading signed by the transporter and receiving location. Include copies of receiving facility's weight slips.
- B. Submit copies of all permits, insurance and licenses for all waste transporters.

## PART 2 PRODUCTS

### 2.1. IMPACTED MATERIAL STORAGE

- A. Transport impacted sediments in sealed, tailgate dump trucks or trailers, with gaskets that are in serviceable condition. The vehicles and storage containers used for the storage and/or transport of impacted materials must be structurally sound and tight to prevent the leakage or spillage of materials.
- B. Use containment materials that will not degrade and are compatible with the contaminants in the waste.
- C. Provide vehicles and containers used for the storage and/or transport of materials with mesh covers to minimize the release of odors from the containers during transport.

### 2.2. SEDIMENT COVERS

- A. Cover sediments storage areas (i.e. stockpile pads and/or barges) with an impermeable cover if the weather forecast calls for rain.
- B. Cover all sediment storage areas within 5-minutes of the start of a rain event.

### 2.3. TRUCK BED LINERS

- A. Except for demolition waste, provide polyethylene impermeable liners for the interior of the dredged impacted material storage containers and vehicles to prevent the leakage of entrained liquids. The liner material must be strong enough to withstand the placement of dredged material into the container without tearing, chemically resistant to the contaminants within the material, and be of sufficient length and width to cover the interior bed of the haul truck with no seams while completely covering over the load with overlap.
- B. Provide staging so that workers can safely place liners into the truck bed. Drivers may not place liners or cover loads.

### 2.4. ODOR SUPPRESSANT

- A. Provide odor and dust suppressing foam to supplement covers, as directed by the COTR.

## PART 3 EXECUTION

### 3.1. SAMPLING AND CHEMICAL ANALYSIS



- A. Sampling and laboratory analyses conducted for off-Site disposal of Construction-related Contaminated Waste will be paid for by the Contractor.
- B. All laboratory analyses arranged by the Contractor will be conducted by a laboratory that is approved by the COTR.

3.2. **LOADING AND TRANSPORTATION OF MATERIAL**

- A. All trucks entering the Site must be free of contamination and/or visual dirt. The Engineer reserves the right to reject trucks that arrive to the Site in a dirty condition.
- B. Provide a dedicated flagger for traffic control at the Site entry to ensure a smooth flow of traffic and to minimize congestion at the Site entrance during all trucking activities.
- C. Appropriately cover and seal trucks filled with dredged material prior to exiting the Site to prevent vapor and fugitive dust emissions during transport. Supplement with odor suppressant foam, as needed. Ensure gross vehicle weight conforms to the most current local, city, state, federal DOT and bridge and tunnel requirements from the point of origin to the final disposal facility.
- D. Perform all Work in and around trucks in appropriate personal protective equipment. Address these specific activities in the Site specific Contractor HASP.
- E. Staging must be provided to access truck beds. Drivers and Site workers are not permitted to climb on vehicles.
- F. Visually inspect transport vehicles for evidence of contamination (inside of wheels and undercarriage) prior to leaving the Site. All trucks prior to leaving the Site will proceed to a decontamination station for cleaning before exiting onto public roads.
  - 1. Brush off equipment using a broom and/or brushes within the dredge area prior to movement to the decontamination pads to decrease the amount of respirable particulates leaving the remediation area.
  - 2. If necessary, at the decontamination pad, pressure wash heavy equipment before allowing it to leave the Site.
- G. Proceed directly to the designated treatment, storage, and disposal facility when departing the Site. No off-Site overnight storage of loaded trucks is permitted.
- H. The Contractor is responsible for any and all actions necessary to remedy situations involving material spilled or leaked in transit, or mud or dirt tracked off-Site. This includes trucks carrying imported fill or other materials to the Site (i.e. dust generated from trucks entering the Site on adjacent roads). Perform cleanup in accordance with all applicable Federal, State, and local regulations at no additional cost to the City.
- I. All transporters used will be properly licensed, permitted, and certified for the service provided.



- J. Do not combine material from the Site with any other material, without approval from the Engineer.
- K. The COTR will sign transport bills of lading or manifests, and provide a hazardous waste generator number, if required. Maintain copies on-Site of all documents involving transportation of materials from the Site. Submit copies of these records to the COTR. Turn over all remaining records to the COTR in a timely manner at the completion of the Work.
- L. Ensure that transport vehicles are properly secured, labeled, and placarded prior to exiting the Site.
- M. Trucks may not form queues on streets outside the Project site. Do not obstruct the normal flow of traffic outside of the Site.
- N. Trucks may not idle engines on-Site for periods longer than 5-minutes before shutting down.

### 3.3. SEDIMENT HANDLING

- A. Operate the dredging portion of the Work to minimize the loss of sediment during the transfer of sediments from the dredging bucket.
- B. Do not drop sediments during transfer from a height greater than 5 feet.
- C. The Engineer may suspend dredging operations for failing to take proper precautions to minimize sediment loss and/or spraying.
- D. Remediate any spillage or spraying of impacted sediments, at the direction of the Engineer, at no additional expense to the City.
- E. Blend dredged sediment with Portland cement (or other COTR approved amended agent) on a 12% by weight basis.
- F. Do not perform sediment stabilization when the forecast calls for rain or during a rain event.
- G. The sediments may be amended in stockpile pads, in the barge at the Project Site, or in the barge at the offload facility.
- H. If the selected Contractor intends to blend materials in-barge, then the barge must be surrounded on all sides by a turbidity curtain and absorbent boom that meets the requirements of Specification Section 35 20 20 - Turbidity Curtains and Absorbent Booms

### 3.4. DISPOSAL OF MATERIALS

- A. Dispose of material removed from the Site at the approved disposal facilities identified in the Contractors Bid, as directed by the COTR.



- B. In the event that material cannot be sent to an approved facility, notify the COTR in writing on the characteristics of the material that are preventing it from being disposed of at the approved disposal facility.
- C. Amend the soil as necessary to meet the moisture requirements of the specified disposal facility.
- D. If any materials are encountered during the Work that appear to exhibit hazardous characteristics, these materials should be segregated, stored on Site, sampled, and disposed of appropriately with the approval of the Engineer.
- E. Decontaminate construction debris and/or bulky material within the dredge area, if encountered, if possible.
- F. Segregate non-contaminated construction debris and bulky wastes for transport and disposal at a facility identified in the Contractors Bid.
- G. Dispose of wastewater, which is not treated on Site and/or discharged under an appropriate permit, at a pre-approved off-Site liquid waste treatment facility that has been identified in the Contractors Bid.
- H. Bulk solid material collected in each wastewater treatment system, as a result of settling in the tank, with excavated impacted material for disposal.
- I. Perform any sampling of untreated liquid waste collected after the demobilization of the water treatment system(s), as needed to dispose of the water at the approved liquid waste disposal facility identified in the Contractors Bid.

END OF SECTION 02 60 00



## **SECTION 35 12 13**

### **MARINE SIGNALING EQUIPMENT**

#### **PART 1 GENERAL**

##### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the installation, maintenance, and removal of all marine signaling equipment required for completing the Work.

##### **1.2. SUBMITTALS**

- A. File a request with the U.S. Coast Guard to deploy the temporary aids to navigation shown on the Contract Drawings.
- B. Submit a Notice to Mariners to the U.S. Coast Guard for the deployment of the marine signaling equipment.

#### **PART 2 PRODUCTS**

##### **2.1. GENERAL**

- A. Furnish marine signaling equipment that is commercially available and designed for marine use.
  - 1. Anchors, if applicable, must be of sufficient weight and strength to hold the equipment in position under typically expected range of operating conditions for the area.

##### **2.2. LIGHTS**

- A. Furnish navigation warning lights that conform to the United States Coast Guard requirements for location, visibility, and color.
- B. Provide navigational lighting on all vessels, including scows and dredge equipment, which complies with applicable U.S. Coast Guard regulations.
- C. Provide lighting for fixed turbidity curtains and any and all other potential hazards to navigation put in place during the Work, in compliance with all applicable U.S. Coast Guard regulations.

##### **2.3. BUOYS**

- A. Provide buoys that are in compliance with all applicable U.S. Coast Guard regulations.

#### **PART 3 EXECUTION**

##### **3.1. INSTALLATION AND OPERATION**

- A. Coordinate with the U.S. Coast Guard and obtain all required permits and file all required notifications prior to mobilizing to the Site.



- B. Furnish and maintain all marine signaling equipment required by U.S. Coast Guard regulations while the Work is being performed.

3.2. MAINTENANCE

- A. Inspect marine signaling equipment daily. Notify the COTR and take immediate corrective action to repair/replace a malfunctioning marine signaling device.

3.3. REMOVAL

- A. Remove the marine signaling equipment within 72 hours when instructed by the Engineer.
- B. Decontaminate all marine signaling equipment that has come into contact with impacted sediments as detailed in Specification Section 01 50 00 – Temporary Facilities and Controls.
- C. Coordinate demobilization and removal of the marine signaling equipment with the U.S. Coast Guard.

END OF SECTION 35 12 13



## **SECTION 35 20 20**

### **TURBIDITY CURTAINS AND ABSORBENT BOOMS**

#### **PART 1 GENERAL**

##### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the installation, maintenance, and removal of all turbidity controls and absorbent booms required for completing the Work.
- B. The COTR will monitor the river during the Work and may direct the Contractor to deploy additional absorbent booms if blebs, sheen, or other visible signs of contamination are observed outside of the environmental controls.

##### **1.2. GENERAL REQUIREMENTS**

- A. The turbidity controls and absorbent boom shown on the Contract Drawings are to be viewed as a conceptual design only. The Contractor is responsible for submitting, installing, and maintaining an acceptable design that meets the performance standards outlined in this Specification Section.
- B. The COTR will potentially accept value engineering solutions that involve alternative materials that the COTR, in its sole opinion, believe are equivalent to what is detailed in the Contract Documents.
- C. The turbidity control and absorbent boom system must be capable of withstanding debris strikes that could be reasonably anticipated on the Potomac River without allowing a release of contaminants of concern.
- D. Remove the existing in-water environmental controls after the turbidity curtain and absorbent boom shown on the Contract Drawings, and specified herein, has been put in place and accepted by the COTR.
- E. The turbidity controls anchor system must hold the bottom edge of the curtain in place vertically such that the curtain is in constant contact with the sediment surface.
- F. If constructed in panels, connect the panels to prevent suspended particles passing through the joints. Connect load lines so that the full strength of the load line is developed across the joint.
- G. Provide a minimum of 4 inches of freeboard along the entire length of system to prohibit the escape of turbid water via overtopping.
- H. The COTR may elect to perform water quality monitoring as described sections 1.4 and 1.5 of this specification. Take immediate action to rectify any deficiencies noted by the COTR in water quality during the performance of the Work.

##### **1.3. SUBMITTALS**



- A. Submit the following items for review and acceptance by the COTR prior to mobilizing any materials covered under this Specification Section to the Site:
1. Cut sheets for all materials.
  2. Shop Drawings of the turbidity controls that includes, but is not limited to, the following:
    - a. Layout of materials.
    - b. Anchorage details specific to what will be used on-Site.

1.4. **TURBIDITY MONITORING**

- A. If the COTR elects to measure turbidity levels during the performance of the Work, it will be performed as follows:
1. To monitor turbidity, the COTR will create a reference location and a monitoring location outside of the fixed turbidity screen. The reference location will be approximately 200 feet outside the fixed turbidity screen, and the monitoring location will be approximately 15 feet outside the fixed turbidity screen.
  2. Turbidity monitoring will typically be performed each day prior to the start of dredging Work, and then once every two hours when dredging is ongoing using an optical backscatter sensor. Monitoring may not be performed each day, depending on the results from previous turbidity level checks and the work being performed. The COTR may revise the frequency of turbidity checks during the performance of the Work, or elect to forgo turbidity monitoring entirely, at their sole discretion.
  3. Given the relatively shallow depth to sediment across the Site, the turbidity levels at the reference and monitoring location will only be checked at the approximate mid-point of the water column.
  4. The turbidity levels for the reference and monitoring locations will then be entered into Table 35 20 20-1 to determine if the Work is maintaining turbidity levels within the allowable limits that have been established for the Project.

**35 20 20-1. Turbidity Monitoring**

Reference Location Turbidity (NTUs)	Permissible Turbidity Increase for the Monitoring Location (NTU)
<10	Reference plus 20 NTUs
11 – 20	Reference plus 15 NTUs
>21	Reference plus 30% of reference

**Notes:**

1. NTU – Nephelometric Turbidity Unit
5. The COTR will alert the Contractor immediately if the allowable turbidity levels are exceeded during the performance of the Work.



6. Upon notification by the COTR that turbidity levels are exceeding their allowable limit, take immediate action to reduce turbid conditions that can include, but are not limited to, the following:
  - a. Reducing the dredge cycle time.
  - b. Repairing the fixed turbidity screen.
  - c. Installing additional turbidity controls.
  - d. Altering the means and methods of the Work.

#### 1.5. SHEEN MONITORING

- A. The COTR will inspect the river for visible sheen beyond the fixed turbidity curtain during each day when dredging Work is being performed.
- B. If, during inspection, visible sheen that is attributable to the remedy is observed beyond the boomed area, the COTR will immediately alert the Contractor.
- C. The Daily Report prepared by the Contractor will note the following items for each day that work is performed in the water:
  1. Any deficiencies found.
  2. Corrective actions taken.
  3. Maintenance performed.

### PART 2 PRODUCTS

#### 2.1. TURBIDITY CONTROLS GENERAL REQUIREMENTS

- A. Furnish turbidity controls that are commercially available, preassembled systems that include a geotextile, flotation system, reefing float, bottom weight, and anchoring and securing mechanism. If assembled in panels, include a secure mechanism for joining panels together.
- B. Use turbidity control materials that meet the following minimum requirements:
  1. Hemmed pockets that are sewn or heat bonded to the curtain flotation material and bottom weights.
  2. Flotation materials that maintain buoyancy if punctured or cut.
  3. A bottom weight of sufficient size to hold the system in a vertical position and to maintain constant contact with the sediment surface.
  4. Anchorage lines of sufficient strength and number to support the system and its components while maintaining its position under typical operating conditions that can be expected on the Potomac River while maintaining position and functionality.



5. Turbidity controls must, at a minimum, consist of U.S. Department of Transportation Type III or better.

## 2.2. ABSORBENT BOOM

- A. Furnish unused, commercially available, oil absorbent booms with end-ties that enable a continuous length of boom to be deployed without gaps.
- B. The absorbent boom must be capable of being attached to the inboard side (dredging side) of the turbidity controls without reducing the effectiveness of the turbidity control or the boom.

## PART 3 EXECUTION

### 3.1. INSTALLATION

- A. Install the fixed turbidity screen, as shown in the Contract Drawings, prior to performing any Work that may disturb sediments and/or create turbid water.
- B. Place the turbidity screen in a furled condition. Do not allow the anchors to sink until the screen has been appropriately positioned.
- C. Tie the absorbent booms to the inboard side (dredging side) of the turbidity controls to form a continuous line of boom.

### 3.2. MAINTENANCE

- A. Inspect the turbidity controls and absorbent booms daily. Perform additional inspections, as may be needed, during inclement weather or after vessel strikes.
- B. The following conditions constitute inadequate performance of the turbidity curtains and require immediate maintenance and/or corrective action:
  1. Any visible plume of cloudy water, or sheen, passing beyond the fixed turbidity controls.
  2. An exceedance of the water quality criteria, as described in sections 1.4 and 1.5 of this section, as measured at the water quality monitoring stations located outside the fixed turbidity curtain, if determined by the COTR to be caused by Work related activities.
- C. Take immediate action to correct inadequate performance of the turbidity curtains.
- D. Maintain the turbidity controls in place until the construction activities have been completed and the turbidity of the water enclosed is reduced to acceptable levels, as determined by the COTR.
- E. Maintenance includes, but is not limited to, the re-positioning of the turbidity controls if they become dislodged, any re-positioning/re-installation needed because of the Contractor's operations, and performing any repairs, as directed by the COTR.



3.3. CLOSEOUT

- A. The turbidity controls will remain in-place at the completion of the Work.
- B. Perform a final inspection of the turbidity controls with the COTR after the dredging and capping has been completed. Repair and/or replace any deficiencies noted during the inspection.
- C. If requested by the COTR, rearrange the turbidity controls prior to demobilizing from the Site.

END OF SECTION 35 20 20



## **SECTION 35 20 23 DREDGING**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for completing the mechanical dredging portion of the Work.

#### **1.2. REFERENCE**

- A. Technical Guidelines for Environmental Dredging of Contaminated Sediments, Environmental Laboratory, U.S. Army Engineer Research and Development Center, Michael R. Palermo, Paul R. Schroeder, Trudy J. Estes, and Norman R. Francingues. (ERDC/EL TR-08-29, September 2008).

#### **1.3. QUALIFICATIONS**

- A. The Contractor, or dredging Subcontractor, shall have completed at least 3 remedial dredging projects of similar size and scope using mechanical methods.
- B. The Contractor's, or dredging Subcontractor's, dredging supervisor shall have a minimum of 5 years of experience with dredging projects in the role of dredging supervisor or superintendent.
- C. The Contractor's, or dredging Subcontractor's, equipment operators, supervisory engineering staff, and technical staff shall have a minimum of 2 years of experience with dredging via mechanical methods.

#### **1.4. DEBRIS**

- A. The Contractor will encounter bottom debris such as, but not limited to, cable, rope, netting, miscellaneous metal, tires, abandoned mooring buoys and blocks, abandoned pilings, fendering, cribbing and other wood debris, ballast and dumped gravel, rock, granite blocks, and cobbles.
- B. Furnish any special or additional equipment that may be required for removing submerged obstructions and debris as needed to complete the Work. Care must be taken when removing any debris encountered adjacent to existing structures to minimize any possible impact.
- C. Separate floating debris contained within the fixed turbidity curtain and stockpile for off-Site disposal.
- D. Minimize the practice of in-water washing/rinsing of debris to remove contaminated sediment.
- E. Properly dispose of debris in accordance with all applicable laws and regulations.



- F. The changing of dredging bucket type or of dredging platform to remove debris is to be included in the Contractors base Bid and will not be considered adequate grounds for a Change Order.

#### 1.5. UTILITIES

- A. Prior to commencement of dredging, coordinate with the applicable utility companies to identify and mark the exact locations of any existing submerged utilities within the Site.

#### 1.6. OVER DREDGE AND SIDE SLOPES

- A. Unless approved in advance by the COTR, payment will only be made on the computed volume of the dredge prism shown in the Contract Drawings plus 6 inches of allowable over dredge, including side slopes.
- B. Minimize over dredge dredging.
- C. Do not exceed the maximum dredge cut line at the base of side slopes. Remove any upslope sediments that fall into the dredge prism.
- D. Dredging performed beyond the limits of the allowable over dredge will not be measured for payment. Additionally, any other pay items impacted by the performance of dredging beyond the allowable dredge limits will not be measured for payment (e.g. barging, transportation and disposal of sediments, etc.). When measuring non pay work related to dredging beyond the over dredge limits, a conversion factor of 1.5 tons/cubic yard will be used to determine the non-pay quantities of other affected pay items.

#### 1.7. PROTECTION OF EXISTING STRUCTURES:

- A. Perform the dredging operation with due care and do not damage, undermine, weaken, or otherwise impair existing structures located near the dredge area.
- B. Use fenders or other temporary structures to protect existing features, as needed.

#### 1.8. FIELD MONITORING:

- A. The COTR may, at their sole discretion, elect to monitor the dredging operations for water quality compliance. Do not perform dredging Work if the COTR has identified a deficiency or failure in the environmental controls until that deficiency is remedied to the satisfaction of the COTR. Claims for lost time because of deficiencies noted in the environmental controls will be denied.

### PART 2 PRODUCTS

#### 2.1. DREDGING EQUIPMENT

- A. Furnish equipment of sufficient size and capacity to dredge sediments to the depths shown on the Contract Drawings.



- B. Furnish a level cut environmental dredging bucket (i.e. a bucket that has been specifically engineered to reduce the amount of water brought up with the sediments during each dredging cycle) for use during the performance of the Work.
- C. Furnish additional dredging buckets as may be needed to remove large pieces of debris.

## 2.2. DREDGING MANAGEMENT SYSTEM

- A. The City strongly prefers that the selected Contractor use a dredging management system to control the Work, however, it is not required for this Project.
- B. If a dredging management system is used, it is required to have the following features:
  - 1. Can be fully integrated with navigational equipment to support precise positioning of the dredging bucket.
  - 2. Is able to process real time data to display the dredging progress in real time.
  - 3. Can generate a progressive dredge prism for submission as part of the Daily Report.
  - 4. Can provide the dredging bucket position on the X and Y axis with Real Time Kinematic (RTK) precision.
  - 5. Can provide the bucket depth (Z-axis) in real time with a level of precision of 0.1 feet and is capable of recording the location and depth of each bucket bite.
  - 6. Ability to display both the existing and proposed dredge grades as well as the cut thickness for a given bucket location.
  - 7. The system must be able to accept and display real time tide data obtained from an electronic tide gauge.
  - 8. Examples of acceptable software suites include Clamvision, Dredgepack and Winops.

## PART 3 EXECUTION

### 3.1. DREDGING

- A. The design and construction of any temporary works (e.g. dredging platforms) needed to complete the dredging Work is the responsibility of the Contractor.
- B. Remove sediments, via mechanical dredging, to the lines, grades, and tolerances shown in the Contract Drawings.
- C. Do not drag the bucket, beam, or other items across the dredge surface to meet design grades.
- D. Slow the rate of ascent and descent of the dredge bucket to reduce potential sediment loss.
- E. Avoid overfilling the bucket; this may cause loss of material as it ascends through the water column.



- F. If the bucket does not close completely because of a debris obstruction. Do not drop the load at the surface to dislodge the debris; complete the dredge pass and stockpile the debris.
- G. The Contractor may change buckets to remove pieces of debris, however, the bucket must then be changed back to the environmental clamshell bucket after the debris has been removed.
- H. Do not stockpile dredged materials on the sediment surface.
- I. Maintain the water quality criteria specified in Section 35 20 20 - Turbidity Curtains and Absorbent Booms.
- J. Perform the surveying Work required for documentation as detailed in Specification Section 02 21 00 – Surveys. Stop Work if the surveying controls malfunction or become obscured.
- K. Stop Work if the dredging management system software malfunctions or ceases to Work. The dredging management system software must be fully operational for any dredging Work to be performed.
- L. Provide a system of communication between the dredge crew, the Contractor's personnel, and the Engineer (portable 2-way marine radios are acceptable).
- M. With the exception of protecting existing structures from imminent damage, do not backfill or cover any dredged areas without prior approval from the COTR.
- N. Furnish a progress as-built drawing to the COTR prepared by the Project Surveyor to demonstrate that the target dredge grades have been reached across the Site prior to beginning the placement of backfill.

### 3.2. TIMBER PILE DEMOLITION

- A. Demolish the three timber piles by either cutting or breaking the pile such that the terminal end will be below, and not interfere with, the remaining portions of the Work (i.e. dredging and capping).
- B. Take precautions to protect adjacent structures from damage when removing the piles.
- C. Remove any jagged edges or splinters at the terminal end of the pile prior to placing fill material.

### 3.3. WATER MANAGEMENT

- A. Minimize the amount of water captured with each bite through the use of an environmental dredging bucket.
- B. Pump free standing liquids recovered with the sediments from the barge or stockpile pad to the on-Site wastewater treatment system for treatment and discharge.



- C. All wastewater collected during the Work must be sent to the on-Site wastewater treatment system for treatment and discharge. Water may only be containerized for off-Site transport and disposal after the wastewater treatment system has been demobilized from the Site.
- D. Do not allow water recovered with the sediments to re-enter the river.

END OF SECTION 35 20 23



## **SECTION 35 43 10 AQUATIC FILLING**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for completing the aquatic filling portion of the Work.

#### **1.2. SUBMITTALS**

- A. Borrow Source Evaluation: Submit the results of the borrow source evaluation for each source to be used as imported fill. The Borrow Source Evaluation must be approved by the COTR prior to the material being imported to the Site. Include the following information as part of the Borrow Source Submittal:
  - 1. Name, address, telephone number, and website address (if available) of the borrow source.
  - 2. A signed letter from the borrow source stating that the fill is native in origin and free of contamination.
  - 3. Analytical results from the borrow source, specific to the actual fill being imported to the Site, as confirmation that the material is free of contamination and in compliance with the clean fill environmental criteria.
  - 4. Geotechnical test results from the borrow source, specific to the actual fill being imported to the Site, as confirmation that the material is in compliance with the clean fill geotechnical criteria.

### **PART 2 PRODUCTS**

#### **2.1. CHEMICAL TESTING CRITERIA**

- A. Furnish a laboratory report for each potential borrow source supplying fill for the Site consisting of the following analyses:
  - 1. Volatile Organic Compounds (VOCs) by EPA Method 8260B.
  - 2. Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270.
  - 3. Total Petroleum Hydrocarbons by EPA Method 8015B.
  - 4. Resource Conservation Recovery Act (RCRA) 8 Metals by EPA Method 6010B/7471.
  - 5. Polychlorinated Biphenyls (PCBs) by EPA Method 8082.

#### **2.2. SAND FILL**



- A. Furnish benthic sand that is free of organic material and lumps or balls of clay that meets the following gradation requirements:

<u>U.S Standard Sieve Size</u>	<u>Percent by Weight Passing</u>
3/8 –inch	100
No. 200	0 to 5

- B. Complete a grain size analysis via ASTM D6913-latest edition for each borrow source of benthic sand. Alternatively, a grain size analysis that has been previously completed by the borrow source, on the specific material to be imported to the Site, may be submitted to satisfy this requirement.

### 2.3. STONE FILL

- A. Furnish stone fill that meets Virginia Department of Transportation (VDOT) standards for #1 VDOT stone.
- B. Complete a grain size analysis via ASTM D6913-latest edition for each borrow source of stone fill to demonstrate that the material conforms to VDOT standards. Alternatively, a grain size analysis that has been previously completed by the borrow source, on the specific material to be imported to the Site, may be submitted to satisfy this requirement.

### 2.4. REACTIVE MAT

- A. Furnish a reactive mat consisted of the Reactive Core Mat™ Organoclay® or COTR approved equivalent.
1. Manufacturer data sheet and contact information available at:  
[http://www.cetco.com/DesktopModules/Bring2mind/DMX/Download.aspx?Comm and=Core\\_Download&PortalId=0&EntryId=148](http://www.cetco.com/DesktopModules/Bring2mind/DMX/Download.aspx?Comm and=Core_Download&PortalId=0&EntryId=148)
- B. To warrant consideration as a viable alternative, proposed equivalent materials must consist of an absorption media capable of removing NAPL from the water column as it migrates upwards through the cap.
- C. If proposing an alternative material, submit manufacturer cut sheets and case studies with the Bid.
- D. Bidders are to construct the base Bid assuming the use of the pre-approved reactive cap material and submit separate pricing as a value added alternative if proposing to use a different reactive cap material.
- E. Bids that do not use the pre-approved reactive cap material in their base Bid pricing may be considered non-responsive and not given further consideration in the selection process.

## PART 3 EXECUTION

### 3.1. INSTALLATION



- A. Placement of fill materials can only commence after the progress as-built drawing of the dredge limits has been reviewed and approved by the COTR.
- B. Place the fill materials to the horizontal and vertical limits as shown in the Drawings. Fill materials are to be placed in lifts not to exceed 1 foot in depth. The top of fill elevations, after placement of all of the fill materials is to be within +/-3.0 inches of the restoration grades shown on the Contract Drawings.
- C. Fill materials may consolidate the top of soft sediments causing a loss of elevation. Place additional aquatic backfill to compensate for any settlement.
- D. If fill materials are present at elevations greater than +3.0 inches above the top of fill elevations shown in the Contract Drawings, then remove fill materials using decontaminated mechanical dredging equipment until the required tolerances have been achieved. The Contractor is responsible for the cost of the corrective removal and the disposal of fill materials associated with these requirements.
- E. Do not stockpile fill material on the bottom of the river.
- F. Do not drag the bucket, beam, or other items across the sediment surface to meet design grades.

### 3.2. REACTIVE CAP MATERIAL PLACEMENT

- A. Install the reactive cap materials following all the manufacturer's suggested procedures.
- B. Lap the panel ends a minimum of 24-inches over the next successive panel.
- C. Lap the panel edges a minimum of 12-inches over the next successive panel.

### 3.3. COMPLETION

- A. The placement of fill materials will be considered complete when a progress as-built drawing of the final bathymetry, which has been prepared by the Project Surveyor, has been reviewed and approved by the COTR.

END OF SECTION 35 43 10



## **SECTION 44 01 40**

### **OPERATION AND MAINTENANCE OF WATER TREATMENT SYSTEM(S)**

#### **PART 1 GENERAL**

##### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the treatment and discharge of impacted water collected during the performance of the Work.

##### **1.2. PUBLICALLY OWNED TREATMENT WORKS (POTW)**

- A. Discharge wastewater treated on-Site to the discharge point identified in the Contract Drawings.
- B. The owner of the POTW that will receive the treated wastewater via the discharge point is Alexandria Renew Enterprises (AlexRenew).
- C. The point of contact for AlexRenew for information on fees, treatment standards, and allowable discharge rates is:

Lisa Reynolds

Regulatory Affairs Officer/Acting Chief of Engineering and Technology

Phone: 703-549-3381x2015

- D. A letter from AlexRenew containing the required information on how to apply for the POTW discharge permit, the required information, and the pre-treatment standards has been appended to the Specifications to assist in the preparation of Bids.

##### **1.3. GENERAL**

- A. Provide a water treatment system(s) (WTS) capable of treating the two types of wastewater streams that will be generated during the performance of the Work, which will consist of the following:
  - 1. Sediment contact water from excess liquids unloaded during the dredging bucket cycle and recovered liquids that were entrained within the sediments.
  - 2. Decontamination wastewater generated during construction.
- B. Furnish the design, materials, and methods required for the construction of the water treatment systems subject to the requirements of the governing limits set by the POTW.
- C. Pay all fines and penalties associated with non-conformance of the water treatment systems that may be assessed by the authority granting permission to discharge to the POTW.
- D. Conform to the conditions of the discharge limits set by the POTW and to any changes in the water quality and/or discharge limit requirements that are disseminated by the POTW.



#### 1.4. SUBMITTALS

- A. Submit the following information to the COTR for review and acceptance prior to mobilizing the wastewater treatment system to the Site:
  - 1. Description of each water treatment system including all equipment (size, capacity, etc.), processes, and monitoring capabilities.
  - 2. Operation and maintenance plan to include regular maintenance, routine inspection requirements, daily operating procedures, and record keeping.
  - 3. Calculations and supporting documentation for the WTS component selection and sizing that have been stamped by an engineer licensed to practice in the State of Virginia.
  - 4. Description of the phasing and coordination between the water treatment systems, ISS, and dredging portions of the Work.
  - 5. A liquid waste containment and disposal contingency plan in the event of a primary system failure.
  - 6. Product information and details on the secondary containment system that will be deployed with the WTS.

### PART 2 PRODUCTS

#### 2.1. PRIMARY WATER TREATMENT EQUIPMENT

- A. Provide a system capable of performing the following unit process functions:
  - 1. Separation and recovery of LNAPL and DNAPL products recovered with the water.
  - 2. Removal of suspended solids by gravity separation and filtration.
  - 3. Removal of volatile and semi-volatile organic compounds to the limits set by the POTW.
  - 4. Removal of metals to the limits set by the POTW.
  - 5. Discharge flow metering.
- B. Choose the type, size, and equipment components needed to complete the Work.
- C. Provide a standby generator with sufficient capacity to provide power to the water treatment systems in the case of a hard line electrical outage. Wire the equipment such that pumping and treatment may continue without interruption, or with only minor interruption in the event of a power outage.
- D. Provide freeze protection for each water treatment system's equipment, piping, and pipe connections to allow for operation through the winter months, including but not limited to: insulation, enclosures, heaters, heat tapes, and circulation pumps.



- E. The materials and equipment used for the water treatment system(s) may be new or used, but must be suitable for the Work, and be maintained in good condition.
- F. Keep on hand, or have immediate access to, spare components to provide for breakdowns that can be reasonably anticipated (i.e. pump failure, additional filter media, etc.).
- G. All water treatment and storage equipment is to remain the property of the Contractor or Subcontractor. Decontaminate all water treatment equipment prior to removal from the Site, as specified in Specification 01 50 00 – Temporary Facilities and Controls.
- H. Provide and maintain a flow meter for each system that meets the requirements of the discharge permit and is capable of recording instantaneous and totalized flow. Provide calibration records for the meter.
- I. Provide sampling ports for collecting samples in accordance with the requirements of the discharge permit.

## 2.2. WATER TREATMENT SYSTEM CONTROLS

- A. Provide adequate system controls to permit unattended operation with only occasional operator checks.
- B. Provide a notification system to alert an operator if the system experiences conditions that will potentially cause the treatment system to shut down.
- C. Provide high-level alarms on tanks to prevent overflow conditions. Alarms may cause automatic actions to relieve the condition or may warn the operator.
- D. If an upset condition occurs which may result in a release or nonconformance with the discharge permit, immediately suspend operation and notify the COTR.

## 2.3. SECONDARY CONTAINMENT

- A. Furnish materials to provide adequate secondary containment for all components of the system that will be treating, storing, or transferring liquid wastes.

# PART 3 EXECUTION

## 3.1. WATER TREATMENT - GENERAL

- A. Mobilize and setup all water treatment equipment as required to treat the collected wastewater.
- B. Perform a pre-production test of each water treatment system in accordance with the requirements of the discharge permit. At a minimum, the pre-production test must consist of the collection and treatment of one settling tank of representative water. Prior to discharge, analytical test results for treated samples collected under the supervision of the COTR must demonstrate that the treated water is in compliance with the requirements of the discharge permit.
- C. Discharge the water treatment systems at the location shown on the Contract Drawings.



- D. Arrange components and provide the means to contain any spills or overflows from the treatment process within the Site.
- E. Provide spill containment for any water treatment chemicals used on-Site.

### 3.2. SEQUENCING AND SCHEDULING

- A. Conduct water treatment activities in conjunction and coordination with decontamination, dredging, in-situ solidification, and backfilling Work.
- B. Provide a water treatment system with the treatment and storage capacity to manage water from dewatering and decontamination Work without causing construction delays.

### 3.3. DISPOSAL OF RESIDUAL WASTE

- A. Manage and dispose of settled solids, collected NAPL, and spent filtration and granular activated carbon adsorption media in accordance with all applicable laws and regulations, and the requirements of the approved receiving facilities.
- B. Any water that does not meet the requirements to be discharged under an appropriate permit, is to be properly contained and disposed of at an off-Site liquid waste treatment facility as described in Section 02 61 00 – Removal and Disposal of Contaminated Materials.
- C. Water that requires containerization and disposal at an off-Site disposal facility because of a failure of the WTS, or the inability of the WTS to adequately treat the wastewater to the limits of the discharge permit, will be disposed of by the Contractor at no additional cost to the Owner.

### 3.4. SAMPLING AND CHEMICAL ANALYSIS

- A. Perform the laboratory analyses as required by the discharge permit.
- B. Perform any laboratory analysis as required to dispose of containerized waste liquids at an off-Site disposal facility.
- C. All laboratory analyses must be conducted by a laboratory that is appropriately licensed to perform such Work in the State of Virginia.
- D. Forward the results of all laboratory analyses to the COTR, upon receipt.

END OF SECTION 44 01 40

## **Appendix C**

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### **Robinson Terminal North Pier Inspection Report**

# **ROBINSON TERMINAL NORTH**

## **PIER INSPECTION REPORT**

Prepared For:  
CityInterests, LLC  
2900 K Street NW  
Suite 401  
Washington, DC 20007

Prepared By:  
Moffatt & Nichol



moffatt & nichol

## 1.0 SCOPE OF WORK AND FACILITY DESCRIPTION

### 1.1 Scope of Work

Moffatt & Nichol (M&N) was retained by CityInterests, LLC to perform a structural inspection and condition assessment of the Robinson Terminal North pier located at 500-501 North Union Street, in Alexandria, VA, on the Potomac River. The inspection consisted of both above-water and below-water investigations of the structure, with a concentration on the structural steel piles. A survey plot was provided prior to the inspection, but no previous inspection reports or as-built drawings were available.

The above-water scope consisted of Level I inspection of all above water elements of the structure, with the exception of any conduit or utilities. The under-water portion of the inspection was proposed as 20-30% Level I (visual) inspection of the supporting piles, however, nearly all of the piles received at least Level I inspection.

### 1.2 Facility Description

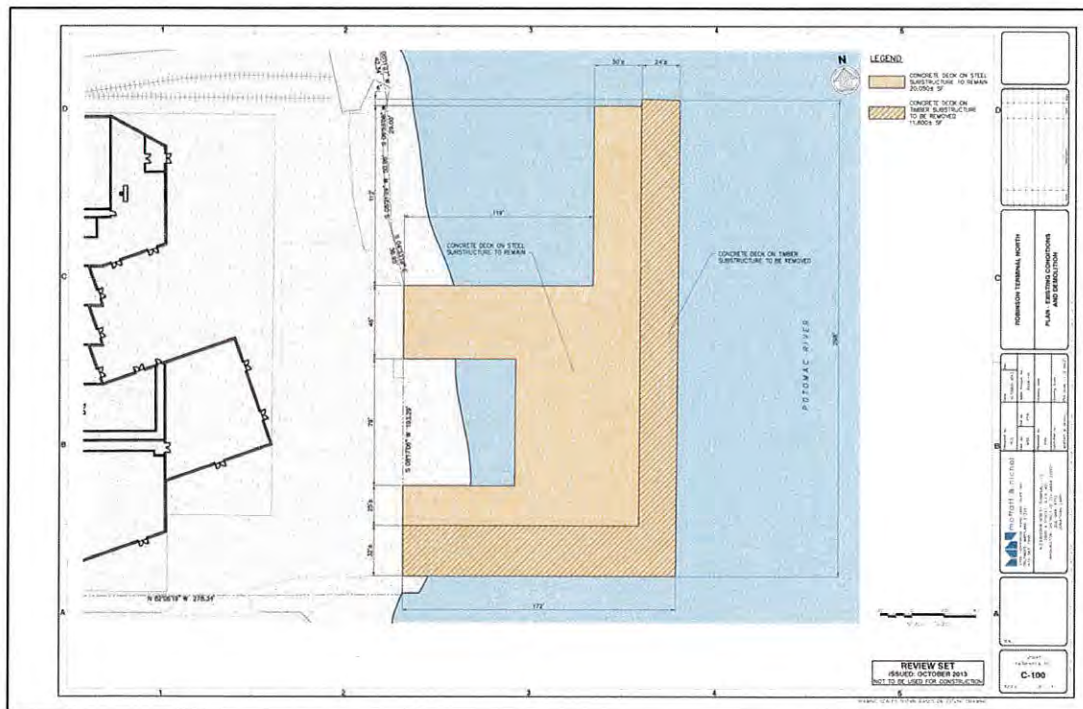
The Robinson Terminal North Pier is located on the western shore of the Potomac River. The pier projects approximately 170 feet offshore with a berthing face of approximately 300 feet in length. The pier appears to have been constructed in at least two phases as differing types of construction are present.



Figure 1-1 – Satellite Image of Pier

As shown in Figure 1-2 below, the southern and eastern faces of the pier consist of timber piles supporting timber and steel framing with a concrete deck surface. The concrete deck consists of plainly-reinforced precast planks of approximate four inch depth with a four inch cast-in-place topping slab. Approximately 11,800 square feet of this type of construction is present at the pier.

The remainder of the pier consists of steel piles supporting steel pile caps and joists, with a concrete deck above. The steel piles are Monotube piles, and were concrete filled. The concrete deck in this area appears to be eight inch prestressed/precast planks with a three inch cast-in-place topping. The greater overall depth of the deck in this area, combined with the use of prestressed planks would suggest that this area of the pier was designed for higher loading than the outboard timber portion. Approximately 20,000 square feet of this type of construction is present at the site.



**Figure 1-2 – Existing Conditions**

Staff members present at the site have indicated that the pier has been used in the past to offload paper. It was also indicated that no cargo operations or significant maintenance has been conducted in recent years. During the inspection, a Potomac Riverboat Company water taxi tied up to the pier to be refueled by a tanker truck, and another vessel, the Hydra, was moored at the pier.

## **2.0 INSPECTION PROCEDURE**

The Robinson Terminal North Pier was inspected under the direction of a registered Professional Engineer. A crew consisting of three engineer-divers completed the above-water and below-water inspections. A Professional Engineer served as Team Leader and directed the inspection team to assure that each component was properly inspected and its condition was properly documented. Inspection procedures for specific elements were developed according to the condition rating system and definitions described in Section 2.4.

All underwater operations were staged from the pier deck, using surface supplied air, a diving helmet, and an umbilical that provided continuous communication between the diver and the topside engineer. A small boat with outboard motor was used to facilitate below-deck inspection of the pier.

Inspection methods and rating procedures for each of the structural members surveyed are described below.

### **2.1 Steel Pipe Piles**

The scope called for Level I (visual) inspection of approximately 25% of the piles. All of the steel piles were inspected above and below the waterline. Some of the steel piles were visually inspected below the waterline, but due to the shallow water depth, most were inspected by divers wading and feeling for defects. Ultrasonic Thickness testing was attempted, but due the fluted cross section of the Monotube piles used, reliable readings could not be obtained.

### **2.2 Timber Piles**

All timber piles were visually inspected above the waterline, and approximately 25% of the piles received Level I inspection below the waterline as well.

### **2.3 Underdeck and Framing**

The underside of the concrete deck and all framing was visually inspected from a small boat powered by an outboard motor. The members were inspected for gross defects and typical conditions. Typical framing members were measured and recorded, but a comprehensive framing plan was not generated.

### **2.4 Condition Survey**

#### *2.4.1 Definitions of Recommendation Categories*

The inspection involves a combination of the following methods:

<b>Level I</b>	A close visual inspection or a tactile examination using large sweeping motions of the hands where visibility is limited. Although this effort is often referred to as a “swim-by” inspection, it must be detailed enough to detect obvious major damage or deterioration caused by overstress or other severe deterioration. It should confirm the continuity of the full length of all members and detect undermining or exposure of normally buried elements.
<b>Level II</b>	A detailed inspection that requires marine growth to be removed from portions of the structure. Cleaning is time consuming, hence the need to base the inspection on a representative sampling of components. For piles, a 12-in-high band should be cleaned at designated locations, generally near the low waterline at the mud line in midway between the low waterline and the mud line. This inspection also should focus on typical areas of weakness such as attachment points and welds. It is intended to detect and identify damaged and deteriorated areas that may be hidden by surface biofouling. The thoroughness of cleaning should be governed by the tasks necessary to discern the condition of the underlying material. Removal of all biofouling staining is generally not required
<b>Level III</b>	A detailed inspection typically involving nondestructive or partially destructive testing, conducted to detect hidden or interior damage or to evaluate material homogeneity. Typical inspection and testing techniques include the use of ultrasonics, coring or boring, physical material sampling, and in situ hardness testing. This inspection is generally limited to key structural areas, areas that are suspect, and areas that may be representative of the underwater structure.

Four categories of recommended repairs are identified and defined as follows:

<b>Immediate</b>	Requires immediate action including possible closing of the structure or areas affected for safety reasons until interim remedial measures, such as shoring or removal of potentially unsafe structures (or elements), can be implemented. These closings or interim remedial actions, if any, always require immediate action upon discovery.
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<b>Priority</b>	Conditions for which no immediate action may be required or for which immediate action has been completed, but further investigations, design and implementation of interim or long-term repairs should be undertaken on a priority basis, i.e., taking precedence over all other scheduled work.
<b>Safety</b>	Conditions that present a potential hazard and which should be repaired as soon as possible.
<b>Routine</b>	Conditions requiring further investigation or remedial work, which can be undertaken as part of a scheduled maintenance program, other scheduled project, or routine facility maintenance, depending on the action required.

#### 2.4.2 Rating Criteria

Terms used to describe the overall condition of a structural system or component thereof are listed and defined below. When the term is applied to an overall structure or system, this does not indicate that all elements of the structure or system are in the same condition.

<b>Good</b>	No visible damage, or only minor damage is noted. Structural elements may show very minor deterioration, but no over stressing is observed. No repairs are required.
<b>Satisfactory</b>	Limited minor to moderate defects or deterioration are observed, but no overstressing is observed. No repairs are required.
<b>Fair</b>	All primary structural elements are sound, but minor to moderate defects or deterioration is observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.
<b>Poor</b>	Advanced deterioration or overstressing is observed on widespread portions of the structure that does not significantly reduce the load -bearing capacity of the structure. Repairs may need to be carried out with a moderate urgency.
<b>Serious</b>	Advanced deterioration, overstressing, or breakage may have significantly affected the load - bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. Repairs may need to be carried out on a high priority basis with urgency

<b>Critical</b>	Overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency
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#### 2.4.3 *Steel Condition Criteria*

Terms used to describe the defects associated with individual steel members are listed and defined below:

##### 2.4.3.1 **Corrosion**

- Minor (or Light) - A light surface rust.
- Moderate - Rust that is loose and flaking with some minor pitting. This scaling, or exfoliation, can be removed with some effort by use of a scraper or chipping hammer. Element exhibits measurable but not significant loss of section.
- Severe – Heavy, stratified rust or rust scales with extensive pitting. Removal requires exerted effort and may require mechanical means. Significant loss of section.

##### 2.4.3.2 **Pitting**

Formation of cavities due to corrosion. Minor, moderate, and severe pitting categories are used based upon depth and density of cavities.

- Minor – Typically less than 1/4 in. diameter and 1/32 in. deep
- Moderate – 1/4 in. to 1/2 in. diameter and up to 1/8 in. deep
- Severe – Greater than 1/2 in. diameter and over 1/8 in. deep

#### 2.4.4 *Timber Condition Criteria*

Terms used to describe the defects associated with individual timber members are listed and defined below:

##### 2.4.4.1 **Fungus Decay**

Generally appears as a moist area with stain or discoloration. Fungi produce conks, which are fruiting bodies, usually fan-like in shape, and which grow horizontally from the wood. They shed spores which propagate the fungus. Conks are a sure sign of

advanced decay and they vary from a fraction of an inch to several inches in length. Sapstain fungi have small black, globular fruiting bodies which smear like soft carbon when brushed with the hand.

- Molds – cottony powdery circular growths varying from white or light colors to black. Molds themselves do not cause decay but their presence is an indication that conditions favorable to growth of fungi exist.
- Stains – specks, spots, streaks, or patches, varying in color, which penetrate the sap wood. Sapstain is harmless to wood. It is usually a surface phenomenon and like molds, implies conditions where harmful fungi can flourish.
- Soft rot – attack the wood, making it soft and spongy. Only the surface wood is affected, and thus it does not significantly weaken the member.
- Brown rot – feeds upon the cellulose and makes the wood dark brown and crumbly.
- White rot – feeds upon both the cellulose and the lignin and makes the wood white and stringy.

Brown and white rots are responsible for structural damage to wood, while the other fungi types simply provide a sign that favorable conditions exist for growth.

#### **2.4.4.2 Splits**

Similar to checks except the separations of the wood fibers extend completely through the piece of wood.

#### **2.4.4.3 Overloading**

Overstressing of the timber element by continuous or impact loads in excess of their ultimate capacity. Typically evident by severe vertical cracks in the timber that cross the grain, breakage of the timber, or bulging of the timber with splitting of the wood fibers.

#### **2.4.5 Concrete Condition Criteria**

Terms used to describe the defects associated with individual concrete members are listed and defined below:

##### **2.4.5.1 Cracking**

A separation into two or more parts with a space between fractured concrete surfaces.

- Hairline – Crack width less than  $\frac{1}{32}$  in.
- Fine – Crack width between  $\frac{1}{32}$  in. and  $\frac{1}{16}$  in.

- Medium – Crack width between  $\frac{1}{16}$  in. and  $\frac{1}{8}$  in.
- Wide – Crack width greater than  $\frac{1}{8}$  in.

The above definitions for cracks can be modified, depending upon the type of structural element. Other terminology, such as map cracking, pattern cracking, etc., may be used as appropriate.

#### **2.4.5.2 Spall**

A roughly circular, oval, or elongated depression in the surface of a concrete element caused by separation of a portion of the surface concrete.

- Small (Pop-out) – Less than 6 in. in diameter and 1 in. deep.
- Medium – Between 6 in. and 12 in. in diameter and up to 2 in. deep.
- Large – Over 12 in. in diameter and any depth.

### **3.0 INSPECTION FINDINGS**

#### **3.1 Steel Monotube Piles**

Overall, the steel pile-supported portion of the pier is in FAIR condition. Only one steel pile was found to have a small hole. The remainder of the piles exhibited minor to moderate surface corrosion with minor to moderate pitting in the tidal zones as well as below the waterline. All piles were in FAIR condition below the tidal zone due to minor to moderate pitting.



**Photo 3-1 – Under North Land Access, Looking West**



**Photo 3-2 – Typical Monotube Condition**



**Photo 3-3 – Hole in Monotube, Concrete Fill Visible**

### **3.2 Timber Piles**

The timber pile-supported portion of the pier is in POOR to SERIOUS condition. Several of the piles were found to be split or hollowed with rot. Most of the timber piles were out of plumb, many to the point where they had limited contact with the bent caps. The timber portion is leaning more at the north end, resulting in this end being approximately five feet wider than the south end. It appears the piles were out of plumb when the inboard steel-supported portion was added, and it doesn't appear to have moved since. However, extensive rehabilitation to this area would be recommended before placing this portion of the pier back in service.



**Photo 3-4 – Northern End of Pier, Piles Leaning and Shimmed**



**Photo 3-5 – Outboard End of Pier, Uneven Spacing Between Timber and Steel Sections**



**Photo 3-6 – Northern End of Pier, Limited Bearing on Cap**



**Photo 3-7 – Outboard Face of Pier, Adjacent Broken Piles**



**Photo 3-8 – Split and Hollow Timber Pile**

### 3.3 Underdeck and Framing

The steel framing used in the pier construction was not found to be consistent over the entire pier area, but various member sizes, and possibly differing steel grades, were used. Some of the steel members exhibited unused bolt holes suggesting the steel framing was recycled from a previously demolished structure. Overall, the steel was in FAIR condition, exhibiting moderate surface corrosion.

The underside of the concrete deck that was open to inspection appeared to be in SATISFACTORY condition, with very little cracking or spalling.

The concrete underdeck at the southern portion of the pier was not open to observation, as the concrete deck appears to have been placed, or poured, on a previously installed timber deck. The timber deck that was visible was in POOR condition, with much of the area in a state of decay.

The areas of the pier supported by timber piles utilize timber cap beams as well. Most of these members are in POOR to SERIOUS condition. The timber caps are rotting to the point of being hollowed out at the end grain, resulting in crushing in some areas. The southern area has timber joists as well, instead of steel joists on timber pile caps like the eastern portion of the pier. The timber joists appeared in POOR to SERIOUS condition as well; some of these members have failed due to rot and section loss.



**Photo 3-9 – Outboard Face of Pier, Shimmed Steel Framing**



**Photo 3-10 – Underside of Precast Panels in Good Condition**



**Photo 3-11 – Rotted and Crushed Timber Pile Cap**



**Photo 3-12 – Timber Decking at South End of Pier**



**Photo 3-13 – Rotted and Failed Timber Joist at South End**

### **3.4 Topside**

From the topside of the pier, only minor cracking and damaged curb was observed, apparently from impact. Several localized areas will need repair.



**Photo 3-14 – Damaged Curb at Northeast Corner**



**Photo 3-15 – Damaged Curb and Deck at North End, Precast Reinforcement Exposed**

A large amount of timber debris was present under the pier, and precluded underwater inspection of the landward-most piles. This debris does not directly affect the condition of the pier, but it is recommended that it be removed to allow inspection and maintenance of the structure.



**Photo 3-16 – Timber Debris**

## **4.0 RECOMMENDATIONS**

The estimated costs listed below include a 25% contingency.

### **4.1 Steel Piles**

In order to prevent further corrosion of the steel piles, installation of sacrificial zinc anodes is recommended as a ROUTINE repair. The anodes will corrode instead of the piles, and can be replaced as needed. Installation of anodes on all steel piles is estimated to cost \$111,250.

### **4.2 Timber Piles**

The timber pile-supported areas of the pier are not recommended for future use. Various rehabilitation options are available. The area can be demolished and reconstructed, or new piles can be driven through the deck to make use of the existing steel framing and concrete deck. Remedial action is recommended as a PRIORITY repair. Demolition of these areas is estimated to cost \$818,750.

### **4.3 Underdeck and Framing**

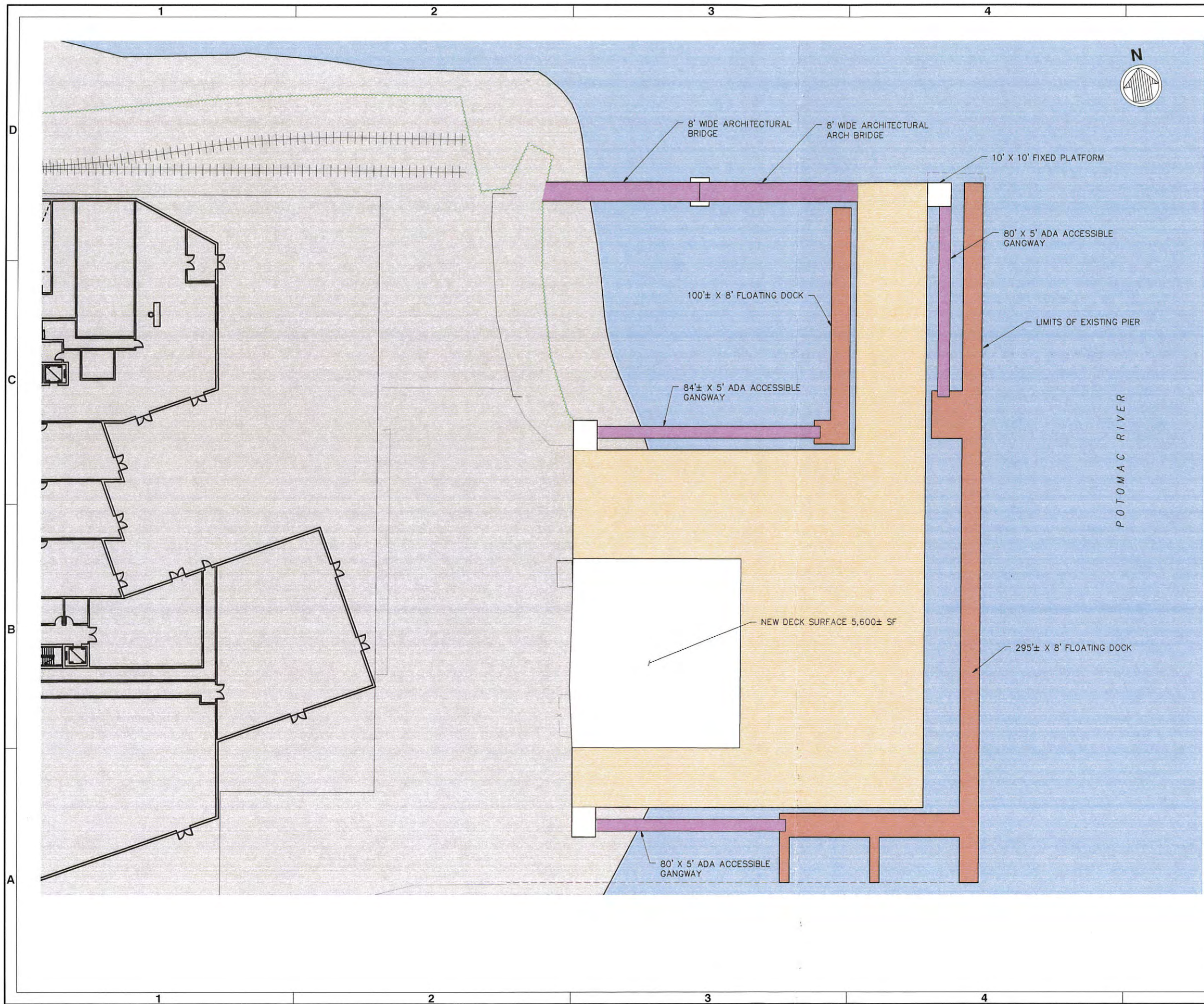
No repairs are recommended for the steel framing at this time. Most members were painted at one time, and have since lost the protective coating. Repainting of the steel would provide protection against corrosion, but it is not deemed necessary.

Several small areas of concrete at the underdeck and topside exhibited exposed reinforcement, for which repair is recommended as a routine repair. Selective demolition, cleaning, and placing epoxy concrete repair is estimated to cost \$37,500.

### **4.4 Topside**

Only repair of damaged curbs, and slab edges included are recommended. The cost for this work is included in the cost for concrete repair listed in Section 4.3





**REVIEW SET**  
**ISSUED: OCTOBER 2013**  
 NOT TO BE USED FOR CONSTRUCTION


DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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ROBINSON TERMINAL NORTH

## PLAN - OPTION 2

**OLDER**

 <b>moffatt &amp; nichol</b> 2700 LIGHTHOUSE POINT EAST, SUITE 501 WASHINGTON, DISTRICT OF COLUMBIA 21224 410-563-7300	Designed by:	PCS	Date:	10/18/13	Rev.	-
	Drawn by:	MSS	Cal'd by:	PCS	M&N Project No.	8226-00
Reviewed by:			Drawing code:			
RVS			Submitted by:			
JONATHAN CARR			Moffatt & Nichol			
ALEXANDRIA NORTH TERMINAL, LLC 2900 K STREET, SUITE 401 WASHINGTON, DISTRICT OF COLUMBIA 20007 202-944-4710 JONATHAN CARR			Plot scale 1:1 (0 SHEET)			

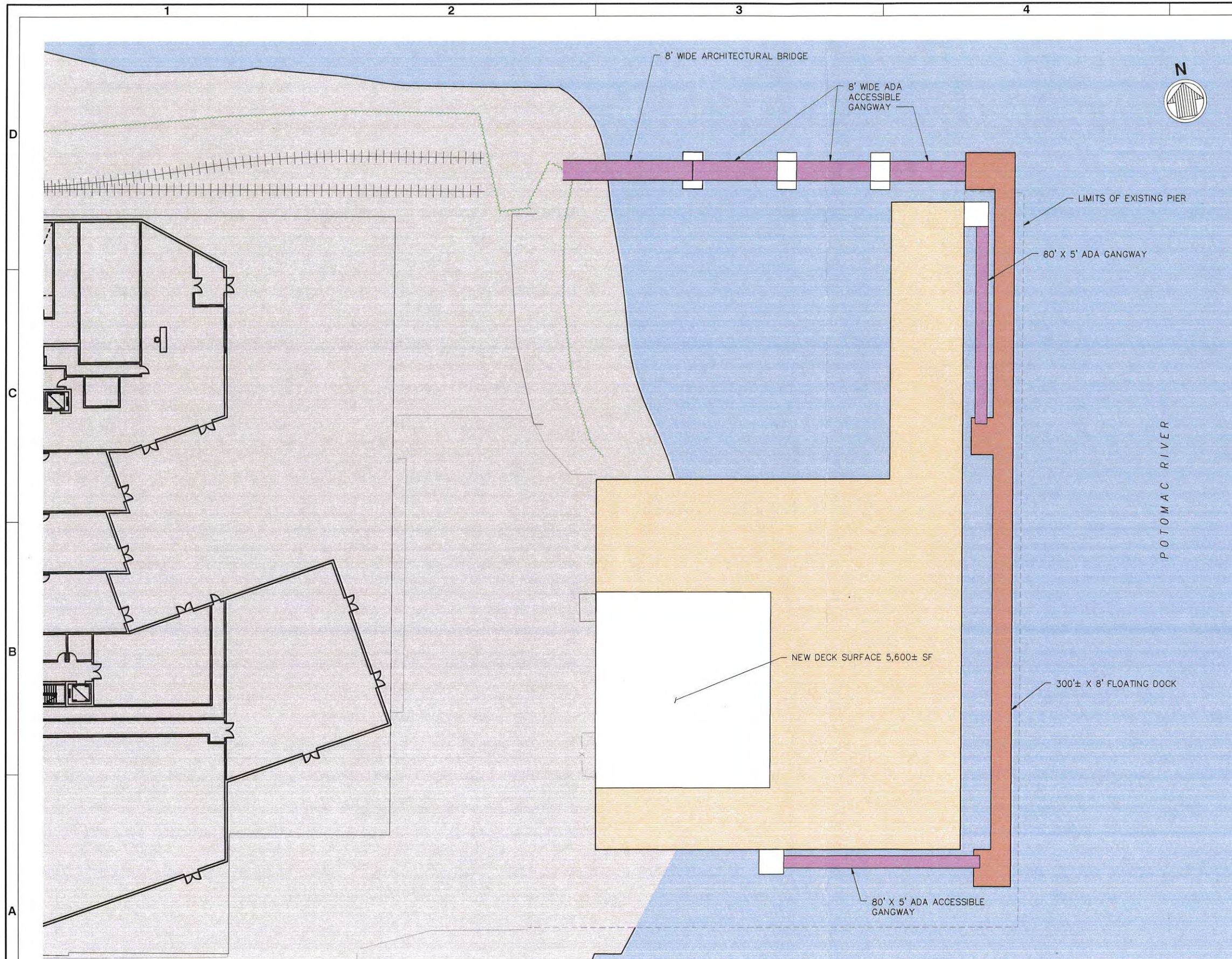
SEAL

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Reference No.

**C-102**

INDEX: 3 OF 3

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**REVIEW SET**  
**ISSUED: OCTOBER 2013**  
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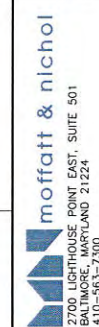
DRAWING SCALES SHOWN BASED ON 22" x 34" DRAWING

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ROBINSON TERMINAL NORTH

**PLAN - OPTION 1**

B	Designed by:	PCS	Date:	10/18/13	Rev.	-
	Drawn by:	MSS	Check by:	PCS	M&M Project No. 8226-00	
	Reviewed by:		Drawing code:			
	RVS					
	Submitted by:	MOFFATT & NICHOL		Drawing Scale:	Plot scale 1:1 (0 SHEET)	



ALEXANDRIA NORTH TERMINAL, LLC  
2900 K STREET, SUITE 401  
WASHINGTON, DISTRICT OF COLUMBIA 20007  
202-944-4710  
JONATHAN CARR

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Reference No.

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INDEX: 2 OF 3

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