FINAL

Soil Excavation and Removal Completion Report

TCCREF Parcel B Areas (FNOD AOCs 6, 11, and 20)

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Table of Contents

List of Tables

List of Figures

Appendices

Acronyms and Abbreviations

AOC	Area of Concern
AST	aboveground storage tank
bgs	below ground surface
BTV	Background Threshold Value
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Constituent of Concern
DERP	Defense Environmental Restoration Program
DMM	discarded military munitions
DRO	Diesel Range Organics
EPA	United States Environmental Protection Agency
ER	Engineer Regulation
FNOD	Former Nansemond Ordnance Depot
FUDS	Formerly Used Defense Site
GRO	Gasoline Range Organics
Hana	Hana Engineers and Consultants, LLC
HASP	Health and Safety Plan
ICP	Inductively Coupled Plasma
ISM	incremental sampling methodology
MCL	maximum contaminant level
MCPG	Marine Corps Power Generation Facility
mg/kg	milligrams per kilogram
MPPEH	materials potentially presenting an explosive hazard
MS	Mass spectrometry
NCP	National Contingency Plan
NPL	National Priorities List
PAH	polycyclic aromatic hydrocarbon
PRG	Preliminary Remediation Goal
PCB	polychlorinated biphenyl
QA	Quality Assurance
RC Demolition	RC Demolition, LLC
RCCP	Reinforced Concrete Cylinder Pipe
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SI	Site Inspection

SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCC	Tidewater Community College
TCCREF	Tidewater Community College Real Estate Foundation
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
UCL	upper confidence limit
UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
US	United States
USACE	United State Army Corps of Engineers
VDEQ	Virginia Department of Environmental Quality
VOC	Volatile Organic Compound
WTP	Water Treatment Plant

1.0 Introduction

This Soil Excavation and Removal Completion Report has been prepared by Hana Engineers and Consultants, LLC (Hana) for the Tidewater Community College Real Estate Foundation (TCCREF). This report summarizes the activities completed between 08 August 2018 and 19 April 2019 for the soil and abandoned structure removal at three areas within the TCCREF Parcel B property in Suffolk, Virginia (**Figure 1**). These three areas correspond to Areas of Concern (AOCs) 6, 11 and 20, which are part of the Former Nansemond Ordnance Depot (FNOD) Formerly Used Defense Site (FUDS).

Since the late 1980s, the United States Army Corps of Engineers (USACE) has performed extensive investigation and remediation of environmental impacts associated with past use of the site. USACE is investigating FNOD in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Defense Environmental Restoration Program (DERP) establishes that USACE follows FUDS Program Policy (Engineer Regulation [ER] 200-3-1) in adhering to CERCLA. FNOD is also currently listed on the National Priorities List (NPL), which was established under the National Contingency Plan (NCP) (40 CFR 300). The NPL is a list of priority “cleanup” sites and is intended primarily to guide EPA in determining which sites warrant further investigation. The primary stakeholders for the FNOD project include representatives of TCCREF, USACE, the United States Environmental Protection Agency (EPA) Region 3, and the Virginia Department of Environmental Quality (VDEQ).

In March 2018, Hana completed soil sampling on the Parcel B portion of TCCREF property. The soil sample results, combined with data previously collected by USACE, were presented in a Draft Field Sampling Report (Hana, 2018a). A limited amount of chemically impacted soil potentially representing a risk to human health, was identified in portions of three AOCs which lie within Parcel B. The three AOCs are:

- AOC 6, Former Marine Corps Power Generation Facility (MCPG),
- AOC 11, Track H and I Magazine Line, and
- AOC 20, Former Water Treatment Plant (WTP).

Based on these results, TCCREF proposed to perform excavation, transport and disposal of soil at AOC 6, AOC 11 and AOC 20, which had been characterized as non-hazardous for disposal purposes. These activities were described in a Final Soil Excavation and Removal Work Plan (Hana, 2018b). This Soil Excavation and Removal Completion Report provides a summary of the soil removal activities that were implemented in accordance with the approved Final Work Plan.

2.0 Site Background

2.1. Current Status

The FNOD property is considered prime valuable waterfront real estate in the Hampton Roads area and may be the largest remaining developable waterfront property in the region. TCCREF is responsible for planning future development of the former Tidewater Community College (TCC) Campus, which lies within the FNOD boundary. Currently, TCCREF is focused on preparing the eastern portion (Parcel B) of the property for future development. AOCs 6, 11, and 20 are the three FNOD sites in the area that are either currently under investigation (AOC 6 and AOC 20) or where remediation was already planned (AOC 11). The scope and timeframe for remediation and subsequent site closure of these 3 AOCs was indeterminate under FUDS. In order to expedite site closure and support future redevelopment of the Parcel B property, TCCREF elected to remove and dispose of soil that potentially required future remediation. In other words, the uncertainties associated with the scope and timeframe for future soil remediation encouraged the landowner to proactively remove soil in order to save time and reduce uncertainties associated with redevelopment. Additional details on the history of FNOD and each AOC are provided in the following sections.

2.2. FNOD History

FNOD is in Suffolk, Virginia and consists of approximately 975 acres. FNOD was established in 1917 and occupied by the United States (US) Army for ammunition supply, maintenance, and disposal functions until 1950. FNOD originated as Pig Point Ordnance Depot and played an important role in storing and shipping various types of munitions during both World War I and World War II. The site was originally constructed as a temporary storage and transshipment facility to support the Port of Embarkation in Newport News. In 1919, the mission changed to an intermediate storage and distribution depot as well as a processing facility for captured enemy munitions. In 1929, the name officially changed to the Nansemond Ordnance Depot.

In 1950, FNOD was transferred to the Department of the Navy and subsequently named the Marine Corps Supply Forwarding Annex. FNOD was deactivated in 1960, and ownership was transferred to the private Beazley Foundation Boys Academy, with a Virginia Department of Highways right-of-way easement. Soon after, the Academy transferred 207 acres to the Virginia Electric Power Company. In 1965, 104 acres were conveyed to GE, and in 1966, the County of Nansemond acquired a 4.70-acre road right-of-way. In 1968, the Beazley Foundation Boys Academy closed, and the Beazley Foundation donated the remaining property to the Virginia State Board of Community Colleges. In 1977, 79.95 acres were conveyed to the sanitation district. The TCC Portsmouth Campus remained active until 2009 when a new campus opened in Portsmouth. The 389 acres that comprise the former TCC Portsmouth Campus are currently owned by TCCREF (Weston, 2014b). TCC currently maintains limited administrative functions and the Driver Training School on the property.

The USACE began investigating potential environmental hazards in the 1980s as a result of historical military use of the Depot and identified a number of individual sites on FNOD. On 22 July 1999, the EPA placed FNOD on the NPL. USACE has completed significant investigation and remediation activities at FNOD under the FUDS program over the past 20 years.

2.3. Physical Characteristics at FNOD (Parcel B)

Physical characteristics for the Parcel B area are described in Section 2.3.1, 2.3.2 and 2.3.3. Due to the geographic proximity of AOCs 6, 11 and 20 (i.e., within Parcel B, East of TCC Lake), the sites have very similar physical characteristics. Additional detail can be referenced in previous site reports (Weston 2014a; Weston 2014b; USACE 2017).

2.3.1 Soils

Soils in the area are vertically extensive and lie on nearly level plains to steep terraces. FNOD soils consist of moderately well-drained to well-drained soils with an organic, silty or clayey subsoil. These soils are underlain by unconsolidated sediments of sand, silt, and clay. The available water capacity of the soils in the FNOD area is moderate to high, and the surface runoff is low. The susceptibility of soils to sheet and rill erosion is moderate. Soils are acidic, and vertical permeability rates range from 0.6 to 2.0 inches/hour.

2.3.2 Geology

The Parcel B area is underlain by near-shore deposits of Holocene age. These deposits are unconsolidated, soft, thick, silty, and clayey sediments containing much organic material. The Pleistocene- and Holocene-age Columbia Group is a surficial deposit composed of gray sand and marl beds of marine origin and has a maximum thickness of approximately 30 feet.

The Columbia Group overlies the Miocene- and Pliocene-age Chesapeake Group, which extends to about 410 feet below sea level at Newport News, Virginia. The Chesapeake Group consists mainly of shell marl, dark-blue or gray clay, and subordinate sandy strata. The Pliocene-age Yorktown Formation is sandy and highly fossiliferous and yields small quantities of hard water. The Miocene-age St. Mary’s formation is a confining blue or gray clay layer. The basal Calvert Formation is diatomaceous and sandy,but is less fossiliferous than the Yorktown.

The Chesapeake Group is underlain by the Chickahominy Formation of upper Eocene-age. It is a marine gray marl containing subordinate glauconite and pyrite and is highly foraminiferal. The Nanjemoy Formation is lower to middle Eocene-age and consists of marine gray marl, glauconite and quartz sand, and thin limestone beds. The Aquia Formation of upper Paleocene-age consists of glauconitic marl and basal quartz sand beds. The maximum thickness of the Aquia Formation is 125 feet. The Upper Cretaceous- and Lower Paleocene-age Mattaponi Formation consists of mottled clay, glauconitic sand and marl, and thick basal quartz sand. The Mattaponi was deposited in estuaries and

bays and is a prolific water-bearing formation. The Potomac Group of Lower and Upper Cretaceous sand and clay beds are deltaic sediments that were deposited in fresh to slightly brackish waters.

2.3.3 Hydrogeology

The groundwater flow system in the Coastal Plain of Virginia is a multi-aquifer system consisting of an eastward-thickening wedge of unconsolidated sand and clay that unconformably rests on the basement rock. The sediments are subdivided into a sequence of discrete lithologic layers that form a regionally correlative geohydrologic framework of aquifers and confining units. Delineated aquifers from youngest to oldest are the Columbia, Yorktown-Eastover, St. Marys-Choptank, Chickahominy-Piney Point, Aquia, and upper, middle, and lower Potomac Aquifers. The Columbia Aquifer is the only unconfined aquifer throughout its entire extent. As a result of Pleistocene channel incision, aquifers and confining units were partially or completely eroded and replaced by material more permeable than the confining units but less permeable than the aquifers. This condition increased the hydraulic connection between surface water in the major river channels and groundwater in the underlying aquifers.

The surficial aquifer, the Columbia Aquifer, is made up of primarily Holocene- and Pleistocene-age sediments that were deposited as channel fill and fluvial-marine terraces. The aquifer is composed of interbedded gravel, sand, silt, and clay and is unconfined. The aquifer is a major source of recharge to the underlying confined flow system. The average thickness is 30 feet, and the maximum thickness is no greater than 60 feet. Aquifer tests indicate a transmissivity of 250 square feet per day (ft^2/day).

The Yorktown-Eastover Aquifer includes the Pliocene Yorktown Formation and the upper portion of the Miocene Eastover Formation. These units were deposited in a shallow marine to deltaic or estuarine environment. The aquifer is confined and is made up of eastward-thickening, interfingering, fine-to-coarse sand interbedded with clay, shell, and sandy clay. It ranges in thickness from 6 feet at its northwestern edge, to approximately 100 feet in the southeastern part of the Virginia Coastal Plain. Permeability ranges from 7.1×10^{-4} centimeters per second (cm/sec) to 1.1×10^{-2} cm/sec in the southeastern part of the Virginia Coastal Plain. Additional hydrogeologic units beneath the Yorktown-Eastover Aquifer are not discussed because based on the known site soil, groundwater, and contaminant characteristics, these units are not relevant for developing a site conceptual model for the area or for evaluating site-specific characteristics.

2.4. AOC Descriptions

2.4.1 AOC 6 Description

AOC 6, Former MCPG, is in a wooded area of FNOD and is bounded to the west by College Drive, to the south by Armistead Road, to the east by wooded areas of TCCREF, and to the north by TCCREF and swamp lands. AOC 6 is approximately one-half acre in size, with the MCPG located in the southwest corner (**Figure 2**). The MCPG was constructed of cinder block walls with a concrete roof, flooring, and footers, and has been

out of service for an undetermined length of time. Topography near AOC 6 slopes gently to the north toward the TCC Lake. No surface water or sediment features are present at AOC 6. Surface water flow follows the slope to the TCC Lake and drains into the James River. The water table is approximately 10 feet below ground surface (bgs).

The former MCPG is a single building that contained a diesel-powered generator, a 12,000-gallon aboveground storage tank (AST), day tank, transformer, and ancillary equipment located within the boundaries of AOC 6 (**Figure 2**). It is presumed that the contents of the transformer were released and flowed out the north door onto the adjacent soil (Weston, 2014b). The volume of the release is not known; however, the date is thought to be sometime in the 1990s according to a USEPA representative on-site. The spill is believed to have been a one-time event localized around the MCPG.

The primary source of contamination at AOC 6 is the release (i.e., spill) of transformer oil on the northern side of the MCPG. The primary chemicals of interest at AOC 6 are polychlorinated biphenyls (PCBs) that were likely introduced into the environment during this single spill event.

Information on the physical characteristics of AOC 6, including surface features, soils, geology, and hydrogeology, can be found in the Final Site Inspection (SI) Report (Weston 2014b).

All abandoned structures associated with AOC-6 were demolished in 2018 by the demolition contractor (RC Demolition) after the soil removal. Materials were recycled in accordance with standard construction practices.

2.4.2 AOC 11 Description

AOC 11, Track H and I Magazine Line, is approximately 17.5 acres located in a wooded area within the central portion of FNOD between TCC Lake and Interstate 664. While in use, AOC 11 contained four Smokeless Powder Magazines (D-403, D-404, E-408, and H-413) and one Ammunition Magazine (I-1) (**Figure 3**). Only storage of smokeless powder and ammunition occurred at AOC 11. No high explosive munitions or bulk explosives were stored at AOC 11.

Ground scars were observed in historical aerial photographs in the areas around H-413, D-403, D-404, I-1, and E-408. A 9,500-gallon chemical storage tank associated with a lumber treatment plant was also observed in historical aerial photographs. Although there is no documentation of the chemical contents of the tank, it is possible that pentachlorophenol was used at FNOD to treat lumber and may have been stored in the tank.

A previously completed RI/FS for AOC-11 identified soil constituent of concern (COCs) and associated PRGs for arsenic, chromium and benzo(a)pyrene. The Soil Removal Work Plan identified three areas for shallow (0-2 bgs) soil removal with confirmation sampling to determine the need for additional removal.

All abandoned structures associated with AOC-11 were demolished in 2018 by the demolition contractor (RC Demolition) after the soil removal. This included asbestos (i.e., transite) abatement in several structures. Other materials were recycled in accordance with standard construction practices. In addition, inert surficial debris (e.g., metal and concrete) was removed throughout the AOC and either recycled or disposed as construction and demolition debris.

2.4.3 AOC 20 Description

AOC 20, Former WTP, is in a wooded area within the central portion of FNOD. AOC 20 is approximately 3 acres in size and situated east of TCC Lake and west of Interstate 664. The AOC is bounded by TCC Lake to the west and north, by a former railroad spur to the east, and by Club Drive to the south (**Figure 4**). Topography at AOC 20 is generally flat to gently rolling and slopes towards TCC Lake. No surface water or sediment features are present within AOC 20. A natural drainage feature (to TCC Lake) exists to the west of the demolition area. This drainage is dry during normal periods and only collects water during heavy rain events.

The WTP was constructed in 1952 to augment the existing FNOD water supply system. The plant was abandoned in 1960. The WTP system consisted of 3 water tanks, 10 water production wells, a Chemical Treatment Building (Building 549B), and pumping stations. The WTP contained a 1-million-gallon aboveground Water Storage Tank (Building 549), which supplied water to the eastern half of FNOD, and two smaller elevated tanks, which supplied water to the western half of FNOD. Prior to soil removal activities in 2018, the large WTP (Building 549), the Chemical Treatment Building (Building 549B), and the Pump House (Building 549A) were still present at the site; however, they were in a state of disrepair and overgrown with vegetation. Other features within AOC 20 included three debris piles and a 3.5-foot concrete pad that was likely used to support a fuel oil AST (Building 549C). The source of the debris is unknown; however, the piles were observed to contain primarily household debris/trash.

After the Draft SI (Weston, 2014a) was completed, the site boundary was expanded to the southwest to include an approximately 110-foot by 110-foot Demolition Area. This area was used by multiple contractors to perform demilitarization of munitions intermittently from 2000 through 2009 during clean-up activities under FUDS. Demilitarization activities conducted at the Demolition Area included the demilitarization and destruction of discarded military munitions (DMM) and materials potentially presenting an explosive hazard (MPPEH) from the Main Burning Ground (SA 5) and Nansemond River Beachfront (AOC 1) sites.

Information on the physical characteristics of AOC 20, including surface features, soils, geology, and hydrogeology, can be found in the Final SI Report (Weston, 2014a).

Unlike AOC-6 and AOC-11, an incremental sampling method (ISM) was used to determine removal areas at the former Demolition Area. Using the ISM method, an

excavation area (approximately 115 by 115 feet in size) was established in the upper 2 feet of the Demolition Area based on concentrations of explosive compounds, mercury, and lead in the decision unit. Additionally, a deeper removal area (0 to 4 feet bgs) was proposed for TNT and mercury.

Exceedances of residential Regional Screening Levels (RSLs) (no PRGs were established) for SVOCs near the former WTP area were limited to 4 sample locations in the vicinity of the former WTP structures. Based on the low levels (< industrial RSLs) of these exceedances, this soil was proposed to be removed in conjunction with the demolition of these relict structures, thus allowing TCCREF to proceed with demolition while waiting to finalize the work plan for the Demolition Area. All abandoned structures and the debris piles associated with AOC-20 were removed by the demolition contractor (RC Demolition) in conjunction with the soil removal. Other materials were recycled in accordance with standard construction practices. In addition, inert surficial debris (e.g., metal and concrete) was removed throughout the AOC and either recycled or disposed as construction and demolition debris.

2.5. Groundwater Sampling

TCCREF performed groundwater sampling at AOC 6 and 20 but not at AOC 11. Temporary groundwater wells were installed at AOC 6 and AOC 20 in March 2018 as described in the Draft Field Sampling Report (Hana, 2018a). The primary purpose of groundwater sampling was to determine if compounds of interest in soils at AOC-6 (PCBs) and AOC-20 (explosives and lead) had potentially impacted groundwater. The wells were sampled in Summer 2018 for PCBs at AOC 6 and Resource Conservation and Recovery Act (RCRA) metals and explosives at AOC 20. Results were compared to November 2018 USEPA RSLs for tap water and maximum contaminant levels (MCLs). No PCBs were detected in AOC 6 groundwater. Total and dissolved metals were detected in AOC 20 groundwater; however, there were no exceedances. Explosives were not detected in AOC 20 groundwater. There were no screening level exceedances in groundwater at AOC 6 or 20. Therefore, there is no indication that groundwater has been impacted by surficial impacts at AOC 6 and 20, and no further action for groundwater determination is warranted. A detailed summary of the results of the groundwater sampling is presented in **Appendix A.**

Previous groundwater sampling at AOCs 6 and 20 are available in the Final SI Reports for these sites (Weston 2014a; Weston 2014b).

2.6. Soil Removal Objectives

The Soil Removal Objective for each AOC is as follows:

> ***Remove and dispose impacted soils off-site to allow for future residential use of the property.***

Applicable RSLs, Background Threshold Values (BTVs), or Preliminary Remediation Goals (PRGs) were used to plan the initial excavation. Ultimately, an iterative risk-

reduction approach was used to determine the final extent of excavation at each AOC as described in Sections 3.3.1 through 3.3.3.

2.6.1 Ecological Risks

Ecological risk was not formally considered in determining the soil excavation areas. The determination to exclude ecological risk was based on TCCREF's current plans to develop TCCREF's Parcel B as a high-density Mixed-Use Development, in accordance with the City of Suffolk's 2026 Comprehensive Plan for this area. This type of development will mitigate potential ecological risk by altering (i.e., excavation, vegetation removal, grading, paving, etc.) the habitat and eliminating the ecological exposure pathways. However, drivers of potential ecological risk are generally co-located with contaminants posing potential risk to human health, thus potential ecological risk was also mitigated by the soil removals and the demolition of the relict structures. EPA Region 3 concurs that any potential residual (post-removal) ecological risk will be mitigated and associated pathways removed by the planned development (see **Appendix I**).

3.0 Removal Activities

This section provides a narrative description of the soil excavation and removal activities. All field activities were coordinated with TCCREF. A photo log documenting the work is presented in **Appendix B**.

RC Demolition, LLC of Norfolk, Virginia (RC Demolition) performed all building demolition, soil removal, and site restoration at AOCs 6, 11, and 20. RC Demolition was responsible for furnishing all the labor, materials, equipment, and related services for excavation, transportation, and disposal of soil. Hana provided 100% oversite of the soil removal to ensure compliance with the procedures established in the Work Plan (Hana, 2018b).

3.1. Pre-Investigation Activities

The following pre-investigation activities were conducted prior to full mobilization:

- Collection and analysis of waste characterization and backfill material samples
- Coordination with TCCREF personnel regarding utility locating and avoidance
- Vegetation reduction
- Coordination with TCCREF personnel regarding site layout and truck ingress/egress routes

3.1.1 Waste Characterization Sampling

Waste characterization samples were collected in place by Hana on 30 March 2018 after the proposed limits of removal were determined. A single composite sample was collected from the proposed removal areas for AOCs 6 and 20, and two composite samples were collected from AOC 11. Each composite sample was comprised of 5 aliquots, collected from 0-0.5 feet bgs at AOCs 6 and 11 and 0-2 feet bgs at AOC 20, from within the proposed removal area. Samples were analyzed for:

- Toxicity Characteristic Leaching Procedure (TCLP) RCRA metals
- Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO)
- TPH Gasoline Range Organics (GRO)
- Ignitability
- Reactivity
- Corrosivity
- Cyanide
- Sulfide
- Extractable Halogens

A summary of the results is provided on **Table 1** and the analytical data package is provided in **Appendix C**. These results indicate that all soils were suitable for disposal as non-hazardous waste at a Subtitle D “Municipal” Landfill.

3.1.2 Analytical Testing of Backfill

Suitable (i.e., silty sand) on-site backfill material was available from an adjoining section of the TCCREF FNOD property near AOC 20. Prior to mobilization, samples were collected on 24 May 2018 and analyzed for the following parameters from this backfill source:

- PCBs
- Volatile Organic Compounds (VOCs)
- Pesticides
- Semivolatile Organic Compounds (SVOCs)
- Target Analyte List (TAL) Metals
- TPH GRO
- TPH DRO

Sample results indicated that the on-site fill was suitable for backfill, as all results were below residential RSLs or below BTVs. EPA Region 3 approved this source of backfill. These backfill soil sample results are summarized in **Table 2a** and the analytical data package is included in **Appendix C**. This clean fill was used as backfill for AOC 6 and 20, and portions of AOC-11.

An additional source of clean fill was identified north of AOC 11. This material consisted of silty sand comprising the raised pad beneath the former J-2 building (AOC-12) that was demolished in 2018. This material was sampled for the same parameters to confirm quality and suitability on 7 February 2019. Initially, a potential concern was identified due to thallium detections as high as 11 mg/kg in soil. Inductively coupled plasma mass spectrometry (ICP-MS) was used to determine that the initial thallium results were false positives due to matrix interference. Use of this material as clean fill was subsequently approved by EPA Region 3. These backfill soil sample results are summarized in **Table 2b** and the analytical data package is included in **Appendix C**. The clean fill was used as backfill at AOC 11.

3.1.3 Utility Clearance

Utility clearance was obtained by RC Demolition by coordinating all activities with TCCREF personnel with relevant knowledge about utilities in the vicinity of the removal areas. During excavation activities at AOC 11, RC Demolition was careful to expose a shallow Reinforced Concrete Cylinder Pipe (RCCP) storm sewer pipe illustrated on the figures for AOC 11 Removal Areas C1 and C2 discussed in Section 3.3.2.1. Excavation in vicinity of the pipe was conducted using a spotter to minimize damage to the pipe. The stone end wall and outlet for this pipe were monitored during rain events and there was no observed flow through the pipe.

3.1.4 Vegetation Reduction

Vegetation clearing commenced on 06 August 2018 and occurred throughout the project. The contractor generally cleared an area using heavy equipment prior to the soil removal

to eliminate interference from vegetation. The demolition and soil removal contractor minimized and limited vegetation removal to only the areas within the soil removal limits and access points to the removal areas. All cleared vegetation remained on site with no chipping or burning permitted. Select trees greater than 12 inches in diameter were not removed and were avoided during soil removal, as discussed in later sections.

3.2. Mobilization and Site Preparation

Site preparation activities were initiated by RC Demolition on 06 August 2018. Site preparation consisted of a kickoff/preconstruction meeting; establishment of construction entrance, access points, staging areas, and work zones; mobilizing equipment and materials; and installing safety protection devices (signs, markers, and high-visibility safety fencing). The site was accessed only through the locked gated entrance, which was locked outside of the normal work hours, Monday-Friday 07:00 to 17:00. No unauthorized visitors were permitted on-site during site operations. A contractor laydown area was not required for the project.

A survey was performed on 25 July 2018 to establish excavation limits, as defined in the Work Plan (Hana, 2018b). Surveying was performed by Precision Measurements, Inc., a registered surveyor licensed in the Commonwealth of Virginia. Horizontal survey controls were determined relative to the Virginia State Plane South to the nearest 0.1-foot interval.

Erosion and sediment control were performed in a manner that minimized impact to the site and overall land disturbance. There are no active stormwater structures within the proposed soil removal areas at AOC 6. The primary purpose of erosion and sediment controls during soil removal was to prevent migration of sediment and stormwater flow to the TCC Lake.

Minimal sediment controls were required because of the natural low-lying topography of the small, shallow excavation areas, which resulted in minimal erosion. Runoff was controlled using soil berms and straw bales installed in drainage features. Straw bales will be removed after vegetation has been reestablished. TCCREF consulted with the City of Suffolk for approval of erosion and sediment control procedures.

3.3. Excavation, Transportation, and Disposal of Waste

This section presents the general approach and design information for the soil excavation.

3.3.1 AOC 6

3.3.1.1 Excavation Extent

Soil removal was completed over this small area on 08 August 2018 and consisted of removing PCB-impacted soil adjacent to the former MCPG, as illustrated on **Figure 5**. The horizontal and vertical extents of the excavation were determined based on the evaluation of sample results during field investigations and are defined in the Work Plan (Hana, 2018b). The soil removal depth was from surface to 1.0-foot bgs. Excavation was accomplished using standard mechanized construction equipment. A total of 17.65 tons of soil was removed from AOC 6.

3.3.1.2 Confirmation Sampling

Post-excavation confirmation soil samples were collected on 08 August 2018 using an ISM approach as described in the Work Plan (Hana, 2018b). Using this initial approach, each bottom and sidewall of an excavation was treated as a decision unit. The purpose of these samples was to document post-removal concentrations of target analytes and to supplement existing data sets. Excavation bottoms were sampled using a minimum of 30 ISM grids and 3 replicates. Excavation sidewalls were sampled using a minimum of 20 ISM grids and 2 replicates. Samples were not obtained from the south wall of the excavation due to the presence of a concrete foundation for the MCPG building that extended several feet below grade. In accordance with the FNOD Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP), an accredited analytical lab was retained to provide sample analysis.

Samples collected from decision unit 1 (bottom) slightly exceeded the residential RSL for Aroclor-1260 in two of three samples. Samples collected from decision unit 4 (east wall) slightly exceeded the residential RSL for Aroclor-1254 in one of two samples and for Aroclor-1260 in both samples. Potential human health risk was approximated through a risk ratio approach for these two PCBs, using the maximum detections. For Arcolor-1254, a noncarcinogen, the calculated hazard quotient was 0.1, which is below the non-carcinogenic residential risk standard. For Aroclor-1260, a carcinogen, the calculated incremental carcinogenic risk was $1.4x10^{-6}$, which is within the EPA target risk range of $1x10^{-6}$ to $1x10^{-4}$. Based on these results, it was determined that no additional excavation at AOC 6 was warranted. EPA Region 3 concurred with this determination.

AOC 6 confirmation sample results are presented in **Table 3**. Analytical and data validation reports for the confirmation samples are presented in **Appendix C** and **Appendix D**, respectively.

3.3.1.3 UCLs

ProUCL 5.1 Software was used to calculate 95% UCLs for AOC-6 data. The 95% UCL represents the upper limit of the mean concentration for an analyte at the site. UCLs were calculated for the following discrete samples: surface soils (0-2 ft bgs) and all depths combined. Relevant data for discrete samples included all previous investigation data that was not removed during the soil removal. For reference, UCLs were also calculated for ISM samples for all depths. UCLs are presented for the purpose of context and reference in **Table 4** below. The UCL output is included in **Appendix E**.

Table 4. Calculated UCLs for AOC 6

Analyte	Discrete UCL (all depths)	Discrete UCL (0-2 ft)	ISM UCL (all depths)
Aroclor-1254	0.0603 mg/kg	0.136 mg/kg	0.0886 mg/kg
Aroclor-1260	0.202 mg/kg	0.111 mg/kg	0.247 mg/kg

3.3.1.4 Load-Out

Trucks were "live-loaded" during excavation so no soils were staged on site. The trucks were carefully filled near the excavation so that all materials entered the truck bed without spilling or scattering. All truck beds were covered to prevent blow-off during transport to the landfill. Trucks were brushed with a broom to remove dust and debris before leaving the excavation area.

3.3.1.5 Transportation and Disposal

Hauling trucks were operated by RC Demolition and Coastline Trucking. Soils were disposed at the Clearfield MMG (formerly Soilex Corporation) facility in Suffolk, VA. Hauling was completed in accordance with all applicable regulations. Each shipment was accompanied by a non-hazardous waste manifest. Transport and disposal paperwork are included as **Appendix F.** Only two trucks were required for AOC 6 due to the small size of the removal area.

3.3.2 AOC 11

3.3.2.1 Excavation Extent

As described in the Work Plan, AOC-11 was divided into three exposure units (EU-1, EU-2 and EU-3) as shown on **Figure 6**. Four separate soil removal areas (A-1, B-1, C-1, and C-2) were identified within EU-2, as illustrated on **Figures 6 and 7**. No removal areas were identified within EU-1 or EU-3. The initial horizontal and vertical extents of the excavation were determined based on the evaluation of sample results during field investigations and are defined in the Work Plan (Hana, 2018b). The initial depths of removal ranged from surface to 2 feet bgs; however, some areas were excavated deeper based on the results of confirmation soil sampling. Each specific area (A-1, B-1, C-1, and C-2) is discussed below in detail. The total amount of soil removed at AOC 11 was approximately 1,220 tons. Excavation was interrupted frequently and delayed by unusually heavy precipitation throughout the summer and fall, which created unsuitable work conditions in the work areas and extremely wet soil. Excavation was accomplished using standard mechanized construction equipment.

Several rounds of confirmation sampling and additional over-excavation were completed at AOC-11 excavation areas B-1, C-1 and C-2. The process for confirmation sampling and over-excavation is generally described in the sections below. Additional detail can be found in three memorandums presented in **Appendices H.1, H.2 and H.3.**

3.3.2.1.1 AOC 11 Removal Area A-1

Excavation was initiated in this area on 06 September 2018 and was completed on 24 September 2018. The final excavation depth for A-1 was 1-foot bgs, and a total of 257 tons of soil were removed. No additional excavation was completed at A-1. Confirmation soil sampling results are discussed in Sections 3.3.2.2 and 3.3.2.2.1.

3.3.2.1.2 AOC 11 Removal Area B-1

Initial excavation was completed in this area on a single day (05 September 2018) due to the small size of the area and 1-foot bgs removal depth. Over-excavation was warranted based on arsenic results of the ISM confirmation samples, and this work was completed on 25 October 2018 (see **Table 5**). Confirmation sampling results are discussed in Sections 3.3.2.2, 3.3.2.2.1 and 3.3.2.2.2. The following decision units were over-excavated by 1.0 foot:

- Area B-1 floor (DU1), east wall (DU3), and south wall (DU4)

Based on the arsenic results for confirmation samples collected after the over-excavation in Area B-1, it was determined that additional over-excavation was warranted. Step out sampling was also proposed for area B-1 in order to define a finite removal extent, as shown on **Figure 7.** Step out samples were collected on 19 December 2018 (see **Table 5** for results), with additional soil removal initiated on 11 January 2019 and completed on 06 February 2019. Weather frequently interfered with the ability to complete the removal in a short timeframe. The following decision units were over-excavated as illustrated on **Figure 7**.

- Area B-1 floor (DU1), east wall (DU3), and south wall (DU4)

The final excavation depth for B-1 varied from 2 feet bgs along the north and west walls to 3 feet bgs along the east and south walls, as illustrated on **Figure 7**. Soils were excavated and shipped in concert with other AOC 11 sub-areas, making it difficult to provide a specific tonnage estimate for soil removed from B-1.

3.3.2.1.3 AOC 11 Removal Areas C-1 and C-2

The entire footprint of AOC 11 Removal Area C-2 lies within AOC 11 Removal Area C-1, as illustrated on **Figure 7**. Excavation started on 30 August 2018 in an area shared by both areas near an abandoned loading dock remaining from an adjacent demolished structure. The loading dock was later demolished to allow excavation beneath it. The first round of excavation for area C-1 was completed on 06 September 2018. The loading dock was removed on 25 September 2018, and the soils underneath it were also removed on this date. This marked completion of the first round of soil removal in areas C-1 and C-2. Additional removal was warranted for both areas based on the initial confirmation sample results. The additional removal was performed from 25 October 2018 to 12 November 2018 on the following decision units:

- Area C-1 floor (DU1), north wall (DU2), south wall (DU4), and west wall (DU5)
- Area C-2 floor (DU1), east wall (DU3), south wall (DU4), and west wall (DU5)

The minimum over-excavation distance for these decision units was planned to be 0.5 feet but actual removal was typically measured to be closer to 1 foot, particularly the floor decision units. This approach was conservatively used in part due to the large size of the excavator bucket and teeth, which made 0.5-foot lifts difficult.

Based on confirmation samples collected after the over-excavation, additional over-excavation was warranted in area C-2. Step out sampling was performed, as discussed in section 2.3.1, with samples collected on 19 December 2018. The sample data and locations are included in **Table 5** and **Figure 7**. Additional soil removal was initiated on 11 January 2019 and completed on 06 February 2019. Weather frequently interfered with the ability to complete the removal in a short timeframe. The following decision units were over-excavated:

- Area C-2 east wall (DU3) in a polygon approximately 12 feet x 40 feet to a depth of 3 feet bgs.
- Area C-2 southwest wall in a polygon approximately 20 feet x 13 feet to a final floor depth of 3 feet bgs.

The final excavation depth for C-1 was 2 feet bgs and for C-2 was 3 feet bgs. Soils were excavated and shipped in concert with other AOC 11 subareas, making it difficult to provide a specific tonnage estimate for soil removed from C-1 and C-2.

3.3.2.2 Confirmation Sampling

Post-excavation confirmation soil samples were collected, as described in section 3.3.1.2. Decision units, based on ISM confirmation sampling results, that warranted additional excavation were over-excavated by a minimum of 0.5 feet and resampled (see sections 3.3.2.1.2 and 3.3.2.1.3) with an expedited turn-around time for results. In all instances, confirmation sampling was completed as close to the end of the soil removal as possible; however, heavy precipitation and flooding of work areas created unavoidable delays at times.

Results of the confirmation samples are presented in **Table 5**. Analytical and data validation reports for the confirmation samples are presented in **Appendix C** and **Appendix D**, respectively. The process for confirmation sampling, decision making (including coordination with regulatory agencies), and over-excavation is documented in **Appendix H**.

Following two rounds of confirmation sampling and soil removal at Exposure Unit 2 (Soil Removal Areas A-1, B-1, C-1 and C-2), a review of the results of confirmation soil sampling yielded uncertainty as to whether additional soil removal would provide any additional benefit via further reduction in concentrations of COCs. Therefore, in accordance with USEPA Guidance, 95% UCLs were calculated using ProUCL 5.1 Software. UCLs were calculated using all relevant data from 2006, 2007, and 2018 (pre- and post-removal soil sample results at Exposure Unit 2). Data that was removed through excavation was excluded from the data set. UCLs were calculated for arsenic, chromium, and benzo(a)pyrene for surface soils (0-2 ft bgs) and all depths combined. A summary of the UCL calculations is provided in a memorandum dated 21 November 2018, presented as **Appendix H.1** (Hana, 2018c). **Table 6** below presents a summary of the pre- and post-removal UCLs at Exposure Unit 2.

Table 6. Calculated UCLs for ISM Soil Samples for AOC 11 Exposure Unit 2

	Arsenic		Chromium		Benzo(a)pyrene	
	All Depths	**0-2 ft**	**All Depths**	**0-2 ft**	**All Depths**	**0-2 ft**
Pre-Removal Results (mg/kg)						
UCL	83.81	112.4	63.43	82	6.466	7.537
PRG or Residential RSL	9.4	15.1	21.7	23.3	3.6	3.6
Post-Removal Results (mg/kg)						
UCL	22.35	26.61	36.14	44.53	1.103	1.254
PRG or Residential RSL	9.4	15.1	21.7	23.3	3.6	3.6

As shown in the table above, significant reduction in overall concentrations of arsenic and chromium was achieved during the first 2 rounds of excavation. However, the post-excavation 95% UCLs for arsenic and chromium remained above the established PRGs for surface soils and all depths. To further evaluate residual risk following excavation, a carcinogenic risk ratio was then estimated for these two COCs. This is represented by the ratio of the 95% UCL and the residential RSL at 1 x 10-6. The results are discussed in more detail in the following subsections.

3.3.2.2.1 Chromium

A carcinogenic risk ratio could not be estimated for total chromium at Exposure Unit 2 because there is no USEPA RSL available for total chromium. Therefore, additional chromium testing (speciated for CrIII:VI) was performed on the soil samples from soil removal area A-1 within Exposure Unit 2, since CrVI is known to be the risk driver. The analysis of the ratio of CrIII to CrVI is presented below in **Table 7.**

Table 7. Ratio of CrIII to CrVI at AOC 11 Exposure Unit 2

Sample ID	Total Chromium (mg/kg)	Chromium VI (mg/kg)	CR (ratio)	Ratio (CrIII to CrVI)
AOC11A1-DU1A	30	2.23	7.43E-06	13.5
AOC11A1-DU1B	22	2.11	7.03E-06	10.4
AOC11A1-DU1C	28	0.888	2.96E-06	31.5
AOC11A1-DU2A	92 J	9.36	3.12E-05	9.8
AOC11A1-DU2B	110	13.7	4.57E-05	8.0
AOC11A1-DU3A	45	4.55	1.52E-05	9.9
AOC11A1-DU3B	53	12.6	4.20E-05	4.2
AOC11A1-DU4A	40 J	3.06	1.02E-05	13.1
AOC11A1-DU4B	42	0.692	2.31E-06	60.7

Sample ID	Total Chromium (mg/kg)	Chromium VI (mg/kg)	CR (ratio)	Ratio (CrIII to CrVI)
AOC11A1-DU5A	74	< 0.143	4.77E-07	517.5
AOC11A1-DU5B	170	5.81	1.94E-05	29.3
C_{max}	170	13.7	4.57E-05	12.4
C_{mean}	63.8	5.5	1.83E-05	11.6
C_{median}	45	3.8	1.27E-05	11.8
PRG	**23.3**	NA	NA	NA

The mean ratio of CrIII to CrVI at Exposure Unit 2 was 11.6, which is greater than the EPA guideline of 6. The 95% UCL for CrVI could not be calculated due to the limited data set, therefore the UCL was calculated for total chromium results applying the 11.6:1 ratio. The results of these calculations are provided in **Appendix H.1** (Hana, 2018c).

Using the 95% UCL results, the estimated carcinogenic risk ratio represented by chromium in soil at AOC-11 was calculated for Exposure Unit 2 and determined to range from $1.28x10^{-5}$ (11.6:1 ratio) to $2.47x10^{-5}$ (6:1 ratio), which is within the EPA target risk range of $1x10^{-6}$ to $1x10^{-4}$. Based on these results, it was determined that no additional excavation was warranted at Exposure Unit 2 for chromium. EPA Region 3 and VDEQ concurred with this determination, as documented in a memorandum dated 14 December 2018, presented as **Appendix H.2** (TCCREF, 2018).

3.3.2.2.2 Arsenic Results

As discussed above, following 2 rounds of excavation at AOC-11, arsenic concentrations within Exposure Unit 2 remained above the established PRGs (based on 95% UCL). To further evaluate potential risk posed by arsenic, the 95% UCL results were compared to the residential RSL to estimate carcinogenic risk via a “risk-ratio”. This is represented by the ratio of the 95% UCL and the residential RSL at 1×10^{-6}. The estimated carcinogenic risk represented by arsenic in soil at AOC-11 was calculated for Exposure Unit 2 and determined to be $3.91x10^{-5}$, which is within the EPA target risk range of $1x10^{-6}$ to $1x10^{-4}$. Much of this risk was contributed by levels that may be associated with background concentrations of arsenic, as described in **Appendix H.1**.

The estimated risk-ratio (using the 95% UCL for Exposure Unit 2) for arsenic following 2 rounds of soil excavation fell within EPA target risk range. However, there were a few individual sample results that EPA Region 3 recommended for additional evaluation and potential removal. Based upon further review of the ISM confirmation sampling results and discussion with EPA Region 3, it was determined that pre-removal discrete sampling in a step-out approach would be an appropriate method to determine the final removal extents for arsenic in soil, provided that the data indicated the final limits of excavation would meet the remediation goal (i.e., future residential use). The proposed sampling approach was documented in a memorandum dated 14 December 2018, presented as

Appendix H.2 (TCCREF, 2018). The following areas were evaluated for additional sampling and over-excavation:

- AOC11-B1-DU1 = Excavation B1, floor
- AOC11-B1-DU3 = Excavation B1, east sidewall
- AOC11-B1-DU4 = Excavation B1, south sidewall
- AOC11-C2-DU3 = Excavation C2, east sidewall
- AOC11-C2-DU5 = Excavation C2, south sidewall

The third round of confirmation samples collected at AOC-11 on 19 December 2018 were discrete, and these arsenic results were used to determine the final areas of additional soil excavation at Areas B-1 and C-2, as summarized in **Appendix H.3** (Hana, 2018d). The step-out sample data and locations, as well as the final removal extents are included in **Table 5** and **Figure 7**.

3.3.2.3 UCLs

Following all soil removal activities, UCLs were calculated for the following for discrete samples: surface soils (0-2 ft bgs) and all depths combined. PRGs have now been met for arsenic and benzopyrene. The chromium PRG was met when speciation is accounted for as per Appendix H. For reference, UCLs were also calculated for ISM samples for all depths. The calculated UCLs for AOC 11 are shown on **Table 8**. The UCL output is included in **Appendix E**.

Table 8. Calculated Post-Removal UCLs for AOC 11

	Arsenic		Chromium (total)		Chromium VI		Benzo(a)pyrene	
	All Depths	0-2 ft	All Depths	0-2 ft	All Depths	0-2 ft	All Depths	0-2 ft
Discrete	8.593 mg/kg	8.916 mg/kg	16.76 mg/kg	20.67 mg/kg	NC	NC	1.091 mg/kg	1.32 mg/kg
ISM	8.15 mg/kg	NC	78.29 mg/kg	NC	7.659 mg/kg	NC	2.04 mg/kg	NC

Note: NC – not calculated; dataset not large enough

3.3.2.4 Load-Out

Live-loading was completed as described in Section 3.3.1.4.

3.3.2.5 Transportation and Disposal

Transportation and disposal of soil was completed, as described in Section 3.3.1.5, and required 131 trucks. Transport and disposal paperwork are included as **Appendix F.**

3.3.3 AOC 20

3.3.3.1 Excavation Extent

Soil removal at AOC 20 consisted of removal of explosives and metals impacted soils from the former Demolition Area, as illustrated on **Figure 8**. Unlike AOC 6 and AOC 11,

an ISM was used to determine removal areas at the former Demolition Area. Using the ISM method, a decision unit designated AOC 20 A-1 was established in the upper 2 feet of the Demolition Area (approximately 115 by 115 feet in size) for explosive compounds, mercury, and lead in soil. Additionally, a deeper area within AOC 20 A-1 was removed for TNT and mercury to a planned depth of 0 to 4 feet bgs. This deeper area was designated as AOC 20 A-2.

Certain SVOCs associated with surficial debris (i.e., trash) piles were identified as potential COCs in previous investigations. The debris piles were located in the vicinity of the relict structures and were removed during the demolition of the relict structures. No evidence of impact (i.e., staining or odor) was observed beneath or around these areas, and the area was completely regraded during demolition operations. Therefore, no additional SVOC samples were collected at AOC-20, and no additional sampling is warranted.

Excavation at the Demolition Area was accomplished using standard mechanized construction equipment. Installation of erosion control measures was completed on 13 August 2018. Excavation of A-1 did not begin until 16 August 2018 due to precipitation and was completed on 29 August 2018. Excavation at A-2 was completed in a single day due to the small size of the removal area (30 August 2018).

Confirmation soil samples indicated that the following decision units for A-2 warranted over-excavation due to residual explosives (2,4,6-TNT) in soil:

- Area A-2 Floor (DU1), east wall (DU3) and south wall (DU4)

As groundwater was encountered 8 feet bgs during temporary monitoring well installation in January of 2018 at AOC 20, field personnel proceeded with extreme caution to avoid excavating into the top of the water table. However, due to the small size of the area, the personnel proceeded to maximum removal depth possible to take advantage of favorable weather and limit iterations of soil removal and sampling. As a result, the sidewalls were over excavated by about 1 foot and the floor was over excavated an additional 3 feet to a final removal depth of approximately 7 feet bgs. A total of 1,061 tons was removed from AOC 20.

3.3.3.2 Confirmation Sampling

Post-excavation confirmation soil samples were collected, as described in Section 3.3.1.2. The initial results indicated elevated concentrations of 2,4,6-TNT in three decision units (DU1, DU2 and DU3). Therefore, additional removal was performed, and a second round of confirmation samples was collected. Although there were minor exceedances of the residential RSL for 2,4,6-TNT in some samples, the average result of triplicate ISM samples were below the residential RSL. Based on these results, it was determined that no additional excavation at AOC 20 was warranted. EPA Region 3 concurred with this determination.

Results of the confirmation samples are presented in **Table 9**. Analytical and data validation reports for the confirmation samples are presented in **Appendix C** and **Appendix D**, respectively.

3.3.3.3 UCLs

In accordance with USEPA Guidance, 95% UCLs were calculated using ProUCL 5.1 Software. UCLs were calculated for the following for discrete samples: surface soils (0-2 ft bgs) and all depths combined. 95% UCLs were calculated using all relevant discrete sampling data. Data that was removed through excavation was excluded from the data set. The calculated UCLs for AOC 20 are shown on **Table 10**. The ProUCL output is included in **Appendix E**.

Table 10. Calculated UCLs for AOC 20

Analyte	Discrete UCL (all depths)	Discrete UCL (0-2 ft)	ISM UCL (all depths)
Lead	34.36 mg/kg	NC	33.03 mg/kg
Mercury	0.178 mg/kg	NC	3.178 mg/kg
2-Amino-4,6-Dinitrotoluene	NC	NC	4.742 mg/kg
2,4,6-Trinitrotoluene	NC	NC	9.835 mg/kg

Note: NC – not calculated; dataset not large enough

3.3.3.4 Load-Out

Live-loading was completed, as described in Section 3.3.1.3.

3.3.3.5 Transportation and Disposal

Transportation and disposal of soil was completed, as described in Section 3.3.1.4, and required 117 trucks. Transport and disposal paperwork are included as **Appendix F.**

3.4. Backfill and Site Restoration

Following achievement of the vertical and horizontal excavation limits, the excavations at the three AOCs were backfilled to grade. The at-grade soil was leveled using the dozer and further groomed to create pockets to retain seed and moisture. Additional compaction was not required, based on the evolving plans for future development of the site. The areas were then seeded with a readily available commercial seed blend suitable for understory areas in the mid-Atlantic region. Straw mulch was applied over the top of seeded areas.

3.5. Demobilization

Upon final backfill and grading RC Demolition demobilized all personnel and equipment from the site on 19 April 2019. Except for newly seeded areas, the site was restored to preconstruction conditions. The haul route was dry-brushed and cleaned as necessary.

4.0 Deviations from Work Plan

This section identifies the components of the soil excavation and removal that deviated from the Work Plan (Hana, 2018b). Deviations are described in additional detail where appropriate within this report and are also listed below for reference:

- Select trees approximately 12 inches in diameter and larger were not removed during vegetation reduction at AOCs 11 and 20. Care was taken by the excavator operator to remove soil as close as possible to the tree, without damaging the root system. There were no trees of size or significance in the AOC 6 removal area. A very large (> 4-foot diameter) old tree was avoided in the central portion of the removal area for AOC-20. This is illustrated in the photos for AOC 20 (**Appendix B**.
- Vegetation reduction at AOC 20 allowed for a full and thorough visual inspection of the western boundary of the removal area. During this inspection, it was apparent that historical maps illustrating surface water and wetland features were not accurate with respect to the proximity of these features to the removal area. Surface water from a finger of the nearby lake to the northwest actually encroached into the limits of the removal area. A tall ridge of approximately 8 feet divided this water in a storm outfall on the southwest corner of the site. To limit impacts to the wetland and surface water, the western boundary of the removal area was moved approximately 30 feet to the east to keep initial excavation operations on a gradient opposite that of surface flow into the wetland. The revised excavation boundary is shown on **Figure 8**. Photos from AOC 20 illustrate the relationship of the removal area to the water features. EPA Region 3 concurred with this decision.
- As discussed in Section 3.3.3, certain SVOCs associated with surficial debris (i.e., trash) piles were identified as potential COCs in previous investigations. The debris piles were located in the vicinity of the relict structures and were removed during building demolition. No evidence of impact (i.e., staining or odor) was observed beneath or around these areas, and the area was completely regraded during demolition operations. EPA Region 3 concurred with this decision.
- Additional erosion control (straw bales) was added to AOC 20 along the western edge to protect the wetlands.

5.0 Performance Standards and Construction Quality Control

This section discusses the standards used to successfully ensure health and safety and to implement the soil excavation and removal.

5.1. Health and Safety

The demolition and removal contractor was responsible for health and safety in accordance with established policies and procedures required for safe operations on the site. A tailgate Health and Safety briefing was conducted by Hana on each day the soil removal activities occurred. Additionally, Hana briefed all site personnel on the potential for MPPEH on the property.

Prior to site mobilization, Hana developed a Health and Safety Plan (HASP) (Hana, 2017). The HASP included Hana's internal health and safety procedures; all Site personnel, contractors, subcontractors, and site visitors were required to be in compliance with the health and safety procedures established by the HASP.

5.2. Construction Quality Assurance

Hana provided independent third-party construction quality assurance (QA) for the soil removal field work. Hana performed the following activities as part of QA for the soil removal:

- Monitor and document activities and check for compliance to the approved project work plan
- Check for correct documentation of disposal and recycling of site materials, including non-hazardous waste manifests and weigh tickets
- Verify that heavy equipment and trucks are clean and free of soil residue before leaving the work area at the AOC
- Check for the quality and suitability of imported fill material to verify that no organic material, trash, roots, vegetation, boulders or objectionable material is returned to the site
- Check for erosion and sediment controls to prevent migration of runoff to TCC Lake or other drainage features
- Check for adequate site access controls

QA was continuously performed by Hana field personnel. Copies of notes taken in the field log book are included as **Appendix G**.

6.0 References

Hana Engineers and Consultants, LLC (Hana), 2018a. Former Nansemond Ordnance Depot Field Sampling Plan, AOC 6, AOC 11, and AOC 20. February 2018.

Hana, 2018b. Soil Excavation and Removal Work Plan, TCCREF Parcel B Areas. July 2018.

Hana, 2018c. Former Nansemond Ordnance Depot, Summary of TCCREF Soil Removal at AOC-11 and confirmation sampling results. November 21, 2018.

Hana, 2018d. Former Nansemond Ordnance Depot, Summary of recent soil sampling results at AOC-11 and proposed additional excavation activities. January 19, 2019.

Hana, 2017. Former Nansemond Ordnance Depot Health and Safety Plan, AOC 6, AOC 11, and AOC 20. November 2017.

Tidewater Community College Real Estate Foundation (TCCREF), 2018. Proposed Additional Sampling at AOC-11 and to determine final soil removal extents. December 14, 2018.

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USACE, 2017, Final Focused Feasibility Study, Area of Concern 11, Track H and I Magazine Line, Former Nansemond Ordnance Depot Suffolk, Virginia. May 2017.

Weston Solutions, Inc (Weston), 2014a. Final Revised Expanded Site Inspection Report, Abandoned Water Treatment Plant, Area of Concern 20, Former Nansemond Ordnance Deport, Suffolk, Virginia. June 2014.

Weston, 2014b. Final Site Inspection Report, Marine Corps Power Generation Facility, Area of Concern 6, Former Nansemond Ordnance Deport, Suffolk, Virginia. September 2014.

TABLES

Table 1. Waste Characterization Summary
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Analyte	AOC11-1a/b		AOC11-2		AOC6		AOC20	
	Result	LQ	Result	LQ	Result	LQ	Result	LQ
TCLP Metals (mg/L)								
Arsenic	< 0.09	U	< 0.09	U	< 0.09	U	< 0.09	U
Barium	0.92		0.77		0.41		0.69	
Cadmium	0.0084	I	0.019		< 0.0045	U	< 0.0045	U
Chromium	< 0.016	U	< 0.016	U	< 0.016	U	< 0.016	U
Lead	< 0.029	U	0.081		0.045	I	0.14	
Selenium	< 0.33	U	< 0.33	U	< 0.33	U	< 0.33	U
Silver	< 0.096	U	< 0.096	U	< 0.096	U	< 0.096	U
Mercury	< 0.000055	U	< 0.000055	U	< 0.000055	U	0.0014	
SVOCs (mg/kg)								
DRO	34	U	72		36		20	
VOCs (mg/kg)								
GRO	< 1.1	U, J	< 1	U	< 0.97	U	< 1.9	U, J
Wet Chemistry								
Ignitability	NOT IGNITABLE		NOT IGNITABLE		NOT IGNITABLE		NOT IGNITABLE	
pH	7.01		6.9		6.51		6.67	
Corrosive	No		No		No		No	
% Moisture	15%		13%		19%		15%	
Flow Injection Analysis								
Total Cyanide (ug/kg)	< 108	U	761		245	J	145	J
Extractable Organic Halogens (mg/kg)	< 11.8	U	< 11.5	U	< 11.9	U	< 11.8	U
Acid Soluble Sulfides (ug/kg)	< 10,600	U	< 11,000	J	< 10,600	U	< 10,700	U

Notes:
LQ - Lab Qualifier
mg/kg = milligram per kilogram
mg/L = milligram per liter
ug/kg = microgram per kilogram
Data Qualifiers:
I - Value is between the laboratory MDL and the laboratory PQL
J - Value is estimated
U - Not detected (< detection limit)

Table 2a. Backfill Soil Sampling Results (May 2018)
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Analyte	USEPA RSLs[1]		TCC-CF-1		TCC-CF-2		TCC-CF-3		TCC-CF-4		TCC-CF-DUP	
	Residental	Industrial	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ
VOCs (mg/kg)												
ACETONE	6,100	67,000	0.004	J	0.0027	U	0.0028	U	0.0023	U	0.084	
CYCLOHEXANE	31	310	0.0015	U	0.0016	U	0.0017	U	0.0014	U	0.0027	J
METHYL ACETATE	7,800	120,000	0.0051	U,Q	0.0054	U	0.0056	U	0.0046	U	0.0062	J
SVOCs - No detections												
PAHs - No detections												
Pesticides and Herbicides (mg/kg)												
DIELDRIN	0.034	0.14	0.00044	U	0.00044	U	0.0011	J	0.00044	U	0.00044	U
p,p-DDE	2.0	9.3	0.00044	U	0.0065		0.0018	J	0.00061	U	0.00044	U
p,p-DDT	1.9	8.5	0.00096	U	0.024		0.0043	J,Q	0.00097	U	0.00095	U
PCBs - No detections												
Fuels - No detections												
Metals (mg/kg)												
ALUMINUM	7,700	110,000	4500		5500		6500		7000		6000	
ARSENIC	0.68	3.0	0.54	U	0.54	U	0.53	U	0.55	U	0.55	U
BARIUM	1,500	22,000	8		17		17		18		9	
BERYLLIUM	16	230	0.011	U	0.011	U	0.033	J	0.03	J	0.013	J
CALCIUM	---	---	190		230		610		420		280	
CHROMIUM	0.3	6.3	**6.5**		**7.1**		**10**		**12**		**12**	
COBALT	2.3	35	0.11	J	0.37		0.51		0.8		0.41	
COPPER	310	4,700	0.54	U	0.84	J	1.1	J	0.91	J	0.55	U
IRON	5,500	82,000	3800		3800		5700		7500		7000	
LEAD	400	800	2.7		3.7		4.3		4.7		3.7	
MAGNESIUM	---	---	370		420		540		560		760	
MANGANESE	180	2,600	9.1		21		18		23		13	
MERCURY	1.1	4.6	0.005		0.023		0.024		0.016		0.005	J
NICKEL	150	2,200	0.97		1.8		2.3		2.7		2.2	
POTASSIUM	---	---	430		390		510		460		580	
SODIUM	---	---	91	J	97	J	110	J	98	J	100	J
VANADIUM	39	580	5		5.6		10		13		12	

Notes:

Only analytes with detections shown on table.

[1] USEPA Regional Screening Levels for Residential and Industrial Soils (May 2018), HQ=0.1

LQ - Lab Qualifier

mg/kg = milligram per kilogram

Data Qualifiers:

J - Value is estimated

Q - relative percent difference (RPD) and/or percent recovery exceeded limits

U - Not detected (< detection limit)

Red indicates Residential RSL exceedance.

Bold indicated Industrial RSL exceedance.

Table 2b. Backfill Soil Sampling Results (February 2019)
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Analyte	CAS	USEPA RSLs[1]		FILL-01[2]		FILL-01_RE1[2]		FILL-01_RE2[2]		FILL-01_RE3[2]		FILL-01_RE4[3]		FILL-01_RE5[3]		FILL-01_RE6[3]	
		Residental	Industrial	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ
Metals (mg/kg)																	
Aluminum	7429-90-5	7,700	110,000	8300	J	9800	J	6900	J	6600	J	N/A		N/A		N/A	
Antimony	7440-36-0	3.10	47.0	0.56	U,J	0.56	U,J	0.56	U	0.55	U	N/A		N/A		N/A	
Arsenic	7440-38-2	0.68	3.0	0.56	U,J	0.56	U	0.56	U	0.55	U	N/A		N/A		N/A	
Barium	7440-39-3	1,500	22,000	40	J	46	J	38		37		N/A		N/A		N/A	
Beryllium	7440-41-7	16.0	230	0.16	J	0.35		0.3		0.29		N/A		N/A		N/A	
Cadmium	7440-43-9	7.10	98.0	0.41		0.6		0.48		0.46		N/A		N/A		N/A	
Calcium	7440-70-2	---	---	1200	J	910		790		750		N/A		N/A		N/A	
Chromium, Total	7440-47-3	---	---	7.7		11		8.6		7.7		N/A		N/A		N/A	
Cobalt	7440-48-4	2.30	35.0	1.6		1.9		1.7		1.7		N/A		N/A		N/A	
Copper	7440-50-8	310	4,700	3.6	J	4.3		4.1		4.2		N/A		N/A		N/A	
Iron	7439-89-6	5,500	82,000	5600	J	6500	J	5000		4700		N/A		N/A		N/A	
Lead	7439-92-1	400	800	11		12		12		13		N/A		N/A		N/A	
Magnesium	7439-95-4	---	---	500		580		500		490		N/A		N/A		N/A	
Manganese	7439-96-5	---	---	44	J	46		48		48		N/A		N/A		N/A	
Nickel	7440-02-0	150	2,200	3.2	J	4.2		3.6		3.4		N/A		N/A		N/A	
Potassium	7440-09-7	---	---	390		540		370		360		N/A		N/A		N/A	
Selenium	7782-49-2	39.0	580	1.1	U	1.1	U	1.1	U	1.1	U	N/A		N/A		N/A	
Silver	7440-22-4	39.0	580	0.22	U	0.22	U	0.23	U	0.22	U	N/A		N/A		N/A	
Sodium	7440-23-5	---	---	56	U	56	U	56	U	55	U	N/A		N/A		N/A	
Thallium	7440-28-0	0.078	1.20	**11**		**8.5**		**10**		**9.7**		0.095	I	0.095	I	0.089	I
Vanadium	7440-62-2	39.0	580	10	J	15	J	12		11		N/A		N/A		N/A	
Zinc	7440-66-6	2,300	35,000	11		13		12		30		N/A		N/A		N/A	
Mercury	7439-97-6	1.10	4.60	0.029	J	N/A		N/A		N/A		N/A		N/A		N/A	
VOCs (ug/kg)																	
Toluene	108-88-3	490,000	4,700,000	4.3	I,J	N/A		N/A		N/A		N/A		N/A		N/A	
Acetone	67-64-1	6,100,000	67,000,000	15	J	N/A		N/A		N/A		N/A		N/A		N/A	
SVOCs (ug/kg)																	
Benzo[a]anthracene	56-55-3	1,100	21,000	32		N/A		N/A		N/A		N/A		N/A		N/A	
Benzo[b]fluoranthene	205-99-2	1,100	21,000	46		N/A		N/A		N/A		N/A		N/A		N/A	
Benzo[a]pyrene	50-32-8	110	2,100	33	I	N/A		N/A		N/A		N/A		N/A		N/A	
Carbazole	86-74-8	---	---	6.4	I	N/A		N/A		N/A		N/A		N/A		N/A	
Pyrene	129-00-0	180,000	2,300,000	62		N/A		N/A		N/A		N/A		N/A		N/A	
Anthracene	120-12-7	1,800,000	23,000,000	6	I	N/A		N/A		N/A		N/A		N/A		N/A	
Indeno(1,2,3-cd)pyrene	193-39-5	1,100	21,000	25		N/A		N/A		N/A		N/A		N/A		N/A	
Chrysene	218-01-9	110,000	2,100,000	37		N/A		N/A		N/A		N/A		N/A		N/A	
Benzo[k]fluoranthene	207-08-9	11,000	210,000	14	I	N/A		N/A		N/A		N/A		N/A		N/A	
Phenanthrene	85-01-8	---	---	36		N/A		N/A		N/A		N/A		N/A		N/A	
Fluoranthene	206-44-0	240,000	3,000,000	62		N/A		N/A		N/A		N/A		N/A		N/A	
Dibenzo[a,h]anthracene	53-70-3	110	2,100	6.5	I	N/A		N/A		N/A		N/A		N/A		N/A	
Benzo[g,h,i]perylene	191-24-2	---	---	23		N/A		N/A		N/A		N/A		N/A		N/A	

Table 2b. Backfill Soil Sampling Results (February 2019)
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Analyte	CAS	USEPA RSLs[1]		FILL-01[2]		FILL-01_RE1[2]		FILL-01_RE2[2]		FILL-01_RE3[2]		FILL-01_RE4[3]		FILL-01_RE5[3]		FILL-01_RE6[3]	
		Residental	Industrial	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ	Result	LQ
PCBs - No Detections																	
Pesticides - No Detections																	
Gasoline Range Organics - No Detections																	
Diesel Range Organics - No Detections																	

Notes:
Only analytes with detections shown on table.
[1] USEPA Regional Screening Levels for Residential and Industrial Soils (November 2018), HQ=0.1
[2] Run with Inductively coupled plasma (ICP)
[2] Run with ICP- Mass spectrometry (MS)
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
N/A = Not Analyzed
LQ - Lab Qualifier
Data Qualifers:
I - The reported value is between the lab MDL and the lab PQL.
J - Estimated Result
Red indicates Residential RSL exceedance.
Bold indicated Industrial RSL exceedance.

Table 3. AOC-6 Confirmation Soil Sampling Results
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Sample ID	Sample Location	Sample Date	Aroclor-1254							Aroclor-1260						
			BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (µg/Kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (µg/Kg)	LQ	DV
					Residential (µg/kg)	Industrial (µg/kg)						Residential (µg/kg)	Industrial (µg/kg)			
AOC6-DU1A	Floor	8/8/2018	---	---	120	970	59	J	J	---	---	240	990	190	J	J
AOC6-DU1B	Floor	8/8/2018	---	---	120	970	63	J	J	---	---	240	990	330		
AOC6-DU1C	Floor	8/8/2018	---	---	120	970	73	J	J	---	---	240	990	290		
AOC6-DU2A	West Wall	8/8/2018	---	---	120	970	< 32	U	U	---	---	240	990	< 32	U	U
AOC6-DU2B	West Wall	8/8/2018	---	---	120	970	< 32	U	U	---	---	240	990	< 32	U	U
AOC6-DU3A	North Wall	8/8/2018	---	---	120	970	< 36	U	U	---	---	240	990	< 36	U	U
AOC6-DU3B	North Wall	8/8/2018	---	---	120	970	< 36	U	U	---	---	240	990	< 36	U	U
AOC6-DU4A	East Wall	8/8/2018	---	---	120	970	93	J	J	---	---	240	990	220		
AOC6-DU4B	East Wall	8/8/2018	---	---	120	970	150			---	---	240	990	300		

Note:

South wall is structural wall and was not sampled.

[1] Lowest background threshold value listed in the USACE Background Sampling Program, October 2013

[2] Final Focused Feasibility Study Report, AOC 11, May 2017

[3] USEPA Regional Screening Level (RSL) for Residential and Industrial Soils (November 2018)

LQ - Lab Qualifier

DV - Data Validation Qualifer

Data Qualifers:

J - Value is estimated

U - Not detected (< detection limit)

Italic indicates BTV exceedance.

Red indicates Residential RSL exceedance.

Bold indicated Industrial RSL exceedance.

indicates PRG exceedance.

Table 5. AOC-11 Confirmation Soil Sampling Results
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Sample ID	Sample Location	Sample Date	Arsenic							Chromium, Total							Hexavalent Chromium (Chromium VI)							Benzo(a)pyrene						
			BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (ug/kg)	LQ	DV
			Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (ug/kg)	Industrial (ug/kg)			
Initial Excavation																														
AOC11A1-DU1A	Floor	10/9/2018	15.1	15.1	0.68	3.0	4.1			23.3	23.3	---	---	*30*			---	---	0.3	6.3	2.23			450	3600	110	2100	*100*	J	J
AOC11A1-DU1B	Floor	10/9/2018	15.1	15.1	0.68	3.0	4.5			23.3	23.3	---	---	22			---	---	0.3	6.3	2.11			450	3600	110	2100	210	J	J
AOC11A1-DU1C	Floor	10/9/2018	15.1	15.1	0.68	3.0	4.6			23.3	23.3	---	---	*28*			---	---	0.3	6.3	0.888			450	3600	110	2100	180	J	J
AOC11A1-DU2A	North Wall	10/3/2018	15.1	15.1	0.68	3.0	4.7			23.3	23.3	---	---	*92*	J	J	---	---	0.3	6.3	**9.36**			450	3600	110	2100	*500*	J	J
AOC11A1-DU2B	North Wall	10/3/2018	15.1	15.1	0.68	3.0	3.5			23.3	23.3	---	---	*110*			---	---	0.3	6.3	**13.7**			450	3600	110	2100	330		
AOC11A1-DU3A	East Wall	10/3/2018	15.1	15.1	0.68	3.0	5.6			23.3	23.3	---	---	*45*			---	---	0.3	6.3	4.55			450	3600	110	2100	170	J	J
AOC11A1-DU3B	East Wall	10/3/2018	15.1	15.1	0.68	3.0	5.3			23.3	23.3	---	---	*53*			---	---	0.3	6.3	**12.6**			450	3600	110	2100	250		
AOC11A1-DU4A	South Wall	10/9/2018	15.1	15.1	0.68	3.0	1.5	J	J	23.3	23.3	---	---	*40*	J	J	---	---	0.3	6.3	3.06			450	3600	110	2100	< 51.3	UJ	UJ
AOC11A1-DU4B	South Wall	10/9/2018	15.1	15.1	0.68	3.0	1.9	J	J	23.3	23.3	---	---	*42*			---	---	0.3	6.3	0.692			450	3600	110	2100	55 J	J	J
AOC11A1-DU5A	West Wall	10/3/2018	15.1	15.1	0.68	3.0	1.7	J	J	23.3	23.3	---	---	*74*			---	---	0.3	6.3	< 0.143	U	U	450	3600	110	2100	65 J	J	J
AOC11A1-DU5B	West Wall	10/3/2018	15.1	15.1	0.68	3.0	3			23.3	23.3	---	---	*170*			---	---	0.3	6.3	5.81			450	3600	110	2100	< 48.9	U	U
AOC11B1-DU1A	Floor	10/3/2018	15.1	15.1	0.68	3.0	*23*			23.3	23.3	---	---	16			---	---	0.3	6.3	N/A			450	3600	110	2100	280		
AOC11B1-DU1B	Floor	10/3/2018	15.1	15.1	0.68	3.0	*64*			23.3	23.3	---	---	17			---	---	0.3	6.3	N/A			450	3600	110	2100	*84*	J	J
AOC11B1-DU1C	Floor	10/3/2018	15.1	15.1	0.68	3.0	*23*			23.3	23.3	---	---	16			---	---	0.3	6.3	N/A			450	3600	110	2100	180	J	J
AOC11B1-DU2A	North Wall	10/2/2018	15.1	15.1	0.68	3.0	5.1			23.3	23.3	---	---	9.6			---	---	0.3	6.3	N/A			450	3600	110	2100	360		
AOC11B1-DU3A	East Wall	10/2/2018	15.1	15.1	0.68	3.0	*35*			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	*700*		
AOC11B1-DU2B	North Wall	10/2/2018	15.1	15.1	0.68	3.0	3.5			23.3	23.3	---	---	9.9			---	---	0.3	6.3	N/A			450	3600	110	2100	430		
AOC11B1-DU3B	East Wall	10/2/2018	15.1	15.1	0.68	3.0	*29*			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	*660*		
AOC11B1-DU4A	South Wall	10/2/2018	15.1	15.1	0.68	3.0	*19*			23.3	23.3	---	---	12			---	---	0.3	6.3	N/A			450	3600	110	2100	***3100***		***J+***
AOC11B1-DU4B	South Wall	10/2/2018	15.1	15.1	0.68	3.0	*18*			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	***4000***		***J+***
AOC11B1-DU5A	West Wall	10/2/2018	15.1	15.1	0.68	3.0	11			23.3	23.3	---	---	11			---	---	s	6.3	N/A			450	3600	110	2100	430		
AOC11B1-DU5B	West Wall	10/2/2018	15.1	15.1	0.68	3.0	13			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	260		
AOC11C1-DU1A	Floor	10/4/2018	15.1	15.1	0.68	3.0	*30*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*1700*		
AOC11C1-DU1B	Floor	10/4/2018	15.1	15.1	0.68	3.0	*53*			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	290		
AOC11C1-DU1C	Floor	10/4/2018	15.1	15.1	0.68	3.0	*26*			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	320		
AOC11C1-DU2A	North Wall	10/2/2018	15.1	15.1	0.68	3.0	*18*			23.3	23.3	---	---	14			---	---	0.3	6.3	N/A			450	3600	110	2100	***11000***	*J*	*J*
AOC11C1-DU2B	North Wall	10/2/2018	15.1	15.1	0.68	3.0	*19*			23.3	23.3	---	---	8.8			---	---	0.3	6.3	N/A			450	3600	110	2100	***9600***		
AOC11C1-DU3A	East Wall	10/2/2018	15.1	15.1	0.68	3.0	3.9			23.3	23.3	---	---	6.9			---	---	0.3	6.3	N/A			450	3600	110	2100	*820*		
AOC11C1-DU3B	East Wall	10/2/2018	15.1	15.1	0.68	3.0	3.4			23.3	23.3	---	---	8.2			---	---	0.3	6.3	N/A			450	3600	110	2100	*580*		
AOC11C1-DU4A	South Wall	10/2/2018	15.1	15.1	0.68	3.0	4.3			23.3	23.3	---	---	8.8			---	---	0.3	6.3	N/A			450	3600	110	2100	*740*		
AOC11C1-DU4B	South Wall	10/2/2018	15.1	15.1	0.68	3.0	5.9			23.3	23.3	---	---	8.9			---	---	0.3	6.3	N/A			450	3600	110	2100	***5300***		
AOC11C1-DU5A	West Wall	10/2/2018	15.1	15.1	0.68	3.0	*39*			23.3	23.3	---	---	9.8			---	---	0.3	6.3	N/A			450	3600	110	2100	130	J	J
AOC11C1-DU5B	West Wall	10/2/2018	15.1	15.1	0.68	3.0	*40*			23.3	23.3	---	---	9.3			---	---	0.3	6.3	N/A			450	3600	110	2100	230	J	J
AOC11C2-DU1A	Floor	10/4/2018	15.1	15.1	0.68	3.0	*35*			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	200	J	J
AOC11C2-DU1B	Floor	10/4/2018	15.1	15.1	0.68	3.0	*26*			23.3	23.3	---	---	12			---	---	0.3	6.3	N/A			450	3600	110	2100	190	J	J
AOC11C2-DU1C	Floor	10/4/2018	15.1	15.1	0.68	3.0	*36*			23.3	23.3	---	---	12			---	---	0.3	6.3	N/A			450	3600	110	2100	250		
AOC11C2-DU2A	North Wall	10/2/2018	15.1	15.1	0.68	3.0	15			23.3	23.3	---	---	8.1			---	---	0.3	6.3	N/A			450	3600	110	2100	< 44.2	U	U
AOC11C2-DU2B	North Wall	10/2/2018	15.1	15.1	0.68	3.0	14			23.3	23.3	---	---	8.7			---	---	0.3	6.3	N/A			450	3600	110	2100	45	J	J
AOC11C2-DU3A	East Wall	10/2/2018	15.1	15.1	0.68	3.0	13			23.3	23.3	---	---	9.7			---	---	0.3	6.3	N/A			450	3600	110	2100	*1600*		
AOC11C2-DU3B	East Wall	10/2/2018	15.1	15.1	0.68	3.0	*18*			23.3	23.3	---	---	8.5			---	---	0.3	6.3	N/A			450	3600	110	2100	*1400*		
AOC11C2-DU4A	South Wall	10/2/2018	15.1	15.1	0.68	3.0	6.9			23.3	23.3	---	---	12			---	---	0.3	6.3	N/A			450	3600	110	2100	***4300***		
AOC11C2-DU4B	South Wall	10/2/2018	15.1	15.1	0.68	3.0	6.3			23.3	23.3	---	---	11			---	---	0.3	6.3	N/A			450	3600	110	2100	***8000***		
AOC11C2-DU5A	West Wall	10/2/2018	15.1	15.1	0.68	3.0	*38*			23.3	23.3	---	---	9.2			---	---	0.3	6.3	N/A			450	3600	110	2100	*1200*		
AOC11C2-DU5B	West Wall	10/2/2018	15.1	15.1	0.68	3.0	*42*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*1600*		
Additional Excavation																														
AOC11B1-DU1A	Floor	10/26/2018	15.1	15.1	0.68	3.0	*61*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-DU1B	Floor	10/26/2018	15.1	15.1	0.68	3.0	*60*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-DU1C	Floor	10/26/2018	15.1	15.1	0.68	3.0	*27*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-DU3A	East Wall	10/26/2018	15.1	15.1	0.68	3.0	*52*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-DU3B	East Wall	10/26/2018	15.1	15.1	0.68	3.0	*59*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-DU4A	South Wall	10/26/2018	15.1	15.1	0.68	3.0	*60*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*700*		
AOC11B1-DU4B	South Wall	10/26/2018	15.1	15.1	0.68	3.0	*37*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*1900*		
AOC11C1-DU1A	Floor	10/26/2018	15.1	15.1	0.68	3.0	*18*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C1-DU1B	Floor	10/26/2018	15.1	15.1	0.68	3.0	14			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C1-DU1C	Floor	10/26/2018	15.1	15.1	0.68	3.0	*22*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C1-DU2A	North Wall	10/26/2018	15.1	15.1	0.68	3.0	*20*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	110	J	J
AOC11C1-DU2B	North Wall	10/26/2018	15.1	15.1	0.68	3.0	*20*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	120	J	J
AOC11C1-DU4A	South Wall	10/26/2018	15.1	15.1	0.68	3.0	N/A			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*1100*		
AOC11C1-DU4B	South Wall	10/26/2018	15.1	15.1	0.68	3.0	N/A			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*2000*		
AOC11C1-DU5A	West Wall	10/30/2018	15.1	15.1	0.68	3.0	*34*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		

Table 5. AOC-11 Confirmation Soil Sampling Results
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Sample ID	Sample Location	Sample Date	Arsenic							Chromium, Total							Hexavalent Chromium (Chromium VI)							Benzo(a)pyrene						
			BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (ug/kg)	LQ	DV
			Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (ug/kg)	Industrial (ug/kg)			
AOC11C1-DU5B	West Wall	10/30/2018	15.1	15.1	0.68	3.0	*29*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU1A	Floor	10/26/2018	15.1	15.1	0.68	3.0	*26*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU1B	Floor	10/26/2018	15.1	15.1	0.68	3.0	*24*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU1C	Floor	10/26/2018	15.1	15.1	0.68	3.0	*24*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU3A	East Wall	10/30/2018	15.1	15.1	0.68	3.0	*110*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU3B	East Wall	10/30/2018	15.1	15.1	0.68	3.0	*50*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU4A	South Wall	10/30/2018	15.1	15.1	0.68	3.0	N/A			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*2300*		
AOC11C2-DU4B	South Wall	10/30/2018	15.1	15.1	0.68	3.0	N/A			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	*6600*		
AOC11C2-DU5A	West Wall	10/30/2018	15.1	15.1	0.68	3.0	*33*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-DU5B	West Wall	10/30/2018	15.1	15.1	0.68	3.0	*50*			23.3	23.3	---	---	10			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
Step-Out Samples																														
AOC11B1-1-2-3	Floor	12/19/2018	15.1	15.1	0.68	3.0	**4.2**	J	J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-1-3-4	Floor	12/19/2018	15.1	15.1	0.68	3.0	1.9		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-2-2-3	Floor	12/19/2018	15.1	15.1	0.68	3.0	**3.1**		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-2-3-4	Floor	12/19/2018	15.1	15.1	0.68	3.0	1.5		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-3-2-3	Floor	12/19/2018	15.1	15.1	0.68	3.0	*52*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-3-3-4	Floor	12/19/2018	15.1	15.1	0.68	3.0	**4.5**		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-4-2-3	Floor	12/19/2018	15.1	15.1	0.68	3.0	2		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-4-3-4	Floor	12/19/2018	15.1	15.1	0.68	3.0	2.9		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-5-0-2	South Wall	12/19/2018	15.1	15.1	0.68	3.0	*43*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-5-2-3	South Wall	12/19/2018	15.1	15.1	0.68	3.0	**15**	J		23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-5-3-4	South Wall	12/19/2018	15.1	15.1	0.68	3.0	**14**			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-8-0-2	South Wall	12/19/2018	15.1	15.1	0.68	3.0	**14**			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-8-2-3	South Wall	12/19/2018	15.1	15.1	0.68	3.0	*25*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-8-3-4	South Wall	12/19/2018	15.1	15.1	0.68	3.0	**13**			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-10-0-2	South Wall	12/19/2018	15.1	15.1	0.68	3.0	1.6			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-10-2-3	South Wall	12/19/2018	15.1	15.1	0.68	3.0	2			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-10-3-4	South Wall	12/19/2018	15.1	15.1	0.68	3.0	2.3		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-11-0-2	East Wall	12/19/2018	15.1	15.1	0.68	3.0	*45*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-11-2-3	East Wall	12/19/2018	15.1	15.1	0.68	3.0	*30*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11B1-11-3-4	East Wall	12/19/2018	15.1	15.1	0.68	3.0	*22*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-1-0-2	East Wall	12/19/2018	15.1	15.1	0.68	3.0	**7.6**		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-2-0-3	East Wall	12/19/2018	15.1	15.1	0.68	3.0	**9.9**		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-3-0-3	East Wall	12/19/2018	15.1	15.1	0.68	3.0	*35*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-4-0-3	East Wall	12/19/2018	15.1	15.1	0.68	3.0	**9.5**		J	23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-7-0-2	West Wall	12/19/2018	15.1	15.1	0.68	3.0	2			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-8-0-2	West Wall	12/19/2018	15.1	15.1	0.68	3.0	**3.6**			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-10-0-2	West Wall	12/19/2018	15.1	15.1	0.68	3.0	*110*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-11-0-2	West Wall	12/19/2018	15.1	15.1	0.68	3.0	*78*			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		
AOC11C2-12-0-2	West Wall	12/19/2018	15.1	15.1	0.68	3.0	**14**			23.3	23.3	---	---	N/A			---	---	0.3	6.3	N/A			450	3600	110	2100	N/A		

Note:

[1] Lowest background threshold value listed in the USACE Background Sampling Program, October 2013

[2] Final Focused Feasibility Study Report, AOC 11, May 2017

[3] USEPA Regional Screening Level (RSL) for Residential and Industrial Soils (November 2018)

LQ = Lab Qualifer

DV = Data Validation Qualifer

N/A = Not Analyzed

Data Qualifers:

J - Value is estimated

J+ - Value is estimated (positive bias)

U - Not detected (< detection limit)

Italic indicates BTV exceedance.

Red indicates Residential RSL exceedance.

Bold indicated Industrial RSL exceedance.

indicates PRG exceedance.

Table 9. AOC-20 Confirmation Soil Sampling Results
Tidewater Community College Real Estate Foundation
Suffolk, Virginia

Sample ID	Sample Location	Sample Date	Mercury							Lead							2-Amino-4,6-dinitrotoluene							2,4,6-Trinitrotoluene						
			BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/Kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/Kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/Kg)	LQ	DV	BTV[1]	Human Health PRG[2]	USEPA RSLs[3]		Result (mg/Kg)	LQ	DV
			Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)				Surface Soil (0-2')	Surface Soil (0-2')	Residential (mg/kg)	Industrial (mg/kg)			
Initial Excavation																														
AOC20A1-DU1A	Floor	9/5/2018	---	---	11	46	1.8			46	---	400	800	41			---	---	150	2300	3.54			---	---	21	96	6.19		
AOC20A1-DU1B	Floor	9/5/2018	---	---	11	46	1.9			46	---	400	800	30			---	---	150	2300	3.05			---	---	21	96	3.87		
AOC20A1-DU1C	Floor	9/5/2018	---	---	11	46	1.1			46	---	400	800	*49*			---	---	150	2300	2.02			---	---	21	96	8.3		
AOC20A1-DU2A	North Wall	9/5/2018	---	---	11	46	0.046			46	---	400	800	7.8			---	---	150	2300	< 0.166	U	U	---	---	21	96	< 0.166	U	U
AOC20A1-DU2B	North Wall	9/5/2018	---	---	11	46	0.17			46	---	400	800	13			---	---	150	2300	0.233			---	---	21	96	1.47		
AOC20A1-DU3A	East Wall	9/5/2018	---	---	11	46	0.66			46	---	400	800	28			---	---	150	2300	0.162			---	---	21	96	0.125	J	J
AOC20A1-DU3B	East Wall	9/5/2018	---	---	11	46	0.87			46	---	400	800	27			---	---	150	2300	0.227			---	---	21	96	0.162	J	J
AOC20A1-DU4A	South Wall	9/5/2018	---	---	11	46	0.75			46	---	400	800	37			---	---	150	2300	0.39			---	---	21	96	0.853		
AOC20A1-DU4B	South Wall	9/5/2018	---	---	11	46	1.8			46	---	400	800	*51*			---	---	150	2300	0.673			---	---	21	96	0.592		
AOC20A1-DU5A	West Wall	9/5/2018	---	---	11	46	1.4			46	---	400	800	31			---	---	150	2300	2.09			---	---	21	96	10.5		
AOC20A1-DU5B	West Wall	9/5/2018	---	---	11	46	2.1			46	---	400	800	43			---	---	150	2300	0.697			---	---	21	96	0.527		
AOC20A2-DU1A	Floor	9/5/2018	---	---	11	46	3.8			46	---	400	800	33			---	---	150	2300	11.4			---	---	21	96	28.2		
AOC20A2-DU1B	Floor	9/5/2018	---	---	11	46	3.4	J	J	46	---	400	800	*73*	J	J	---	---	150	2300	9.26			---	---	21	96	**165**		
AOC20A2-DU1C	Floor	9/5/2018	---	---	11	46	7.9			46	---	400	800	41			---	---	150	2300	9.22			---	---	21	96	12.2		
AOC20A2-DU2A	North Wall	9/5/2018	---	---	11	46	0.017			46	---	400	800	4.8			---	---	150	2300	< 0.187	U	U	---	---	21	96	< 0.187	U	U
AOC20A2-DU2B	North Wall	9/5/2018	---	---	11	46	0.057			46	---	400	800	6.2			---	---	150	2300	< 0.194	U	U	---	---	21	96	< 0.194	U	U
AOC20A2-DU3A	East Wall	9/5/2018	---	---	11	46	5.9			46	---	400	800	23			---	---	150	2300	20.5			---	---	21	96	76.5		
AOC20A2-DU3B	East Wall	9/5/2018	---	---	11	46	2.7			46	---	400	800	29			---	---	150	2300	0.98			---	---	21	96	20.4		
AOC20A2-DU4A	South Wall	9/5/2018	---	---	11	46	17			46	---	400	800	*92*			---	---	150	2300	40.2			---	---	21	96	**212**		
AOC20A2-DU4B	South Wall	9/5/2018	---	---	11	46	25			46	---	400	800	*150*			---	---	150	2300	39.5			---	---	21	96	**201**		
AOC20A2-DU5A	West Wall	9/5/2018	---	---	11	46	0.32			46	---	400	800	3.9			---	---	150	2300	0.144	J	J	---	---	21	96	< 0.162	U	U
AOC20A2-DU5B	West Wall	9/5/2018	---	---	11	46	0.12			46	---	400	800	7.5			---	---	150	2300	0.171			---	---	21	96	0.0648	J	J
Additional Excavation																														
AOC20A2-2-DU1A	Floor	10/23/2018	---	---	11	46	0.8894			46	---	400	800	N/A			---	---	150	2300	4.5			---	---	21	96	23.9		
AOC20A2-2-DU1B	Floor	10/23/2018	---	---	11	46	2.19			46	---	400	800	N/A			---	---	150	2300	9.74			---	---	21	96	9.92		
AOC20A2-2-DU1C	Floor	10/23/2018	---	---	11	46	6.25			46	---	400	800	N/A			---	---	150	2300	1.38			---	---	21	96	11.6		
AOC20A2-2-DU3A	East Wall	10/23/2018	---	---	11	46	7.57			46	---	400	800	N/A			---	---	150	2300	11.9			---	---	21	96	34.6		
AOC20A2-2-DU3B	East Wall	10/23/2018	---	---	11	46	0.8581			46	---	400	800	N/A			---	---	150	2300	0.954			---	---	21	96	6.46		
AOC20A2-2-DU4A	South Wall	10/23/2018	---	---	11	46	5.43			46	---	400	800	N/A			---	---	150	2300	7.51		J	---	---	21	96	16.8		
AOC20A2-2-DU4B	South Wall	10/23/2018	---	---	11	46	4.4			46	---	400	800	N/A			---	---	150	2300	7.57			---	---	21	96	7.49		

Note:
[1] Lowest background threshold value listed in the USACE Background Sampling Program, October 2013
[2] Final Focused Feasibility Study Report, AOC 11, May 2017
[3] USEPA Regional Screening Level (RSL) for Residential and Industrial Soils (November 2018, THQ=1.0)
LQ = Lab Qualifer
DV = Data Validation Qualifer
N/A = Not Analyzed
Data Qualifers:
J - Value is estimated
U - Not detected (< detection limit)
Italic indicates BTV exceedance.
Red indicates Residential RSL exceedance.
Bold indicated Industrial RSL exceedance.
indicates PRG exceedance.

FIGURES

Site Map

Date: December 2018

TIDEWATER COMMUNITY COLLEGE REAL ESTATE FOUNDATION
Suffolk, Virginia

Figure: 1

HANA ENGINEERS & CONSULTANTS, LLC

AOC-6 Location and Features

Date: December 2018

TIDEWATER COMMUNITY COLLEGE REAL ESTATE FOUNDATION
Suffolk, Virginia

Figure: 2

HANA ENGINEERS & CONSULTANTS, LLC

AOC-11 Location and Features

Date: December 2018

TIDEWATER COMMUNITY COLLEGE REAL ESTATE FOUNDATION
Suffolk, Virginia

Figure: 3

HANA ENGINEERS & CONSULTANTS, LLC

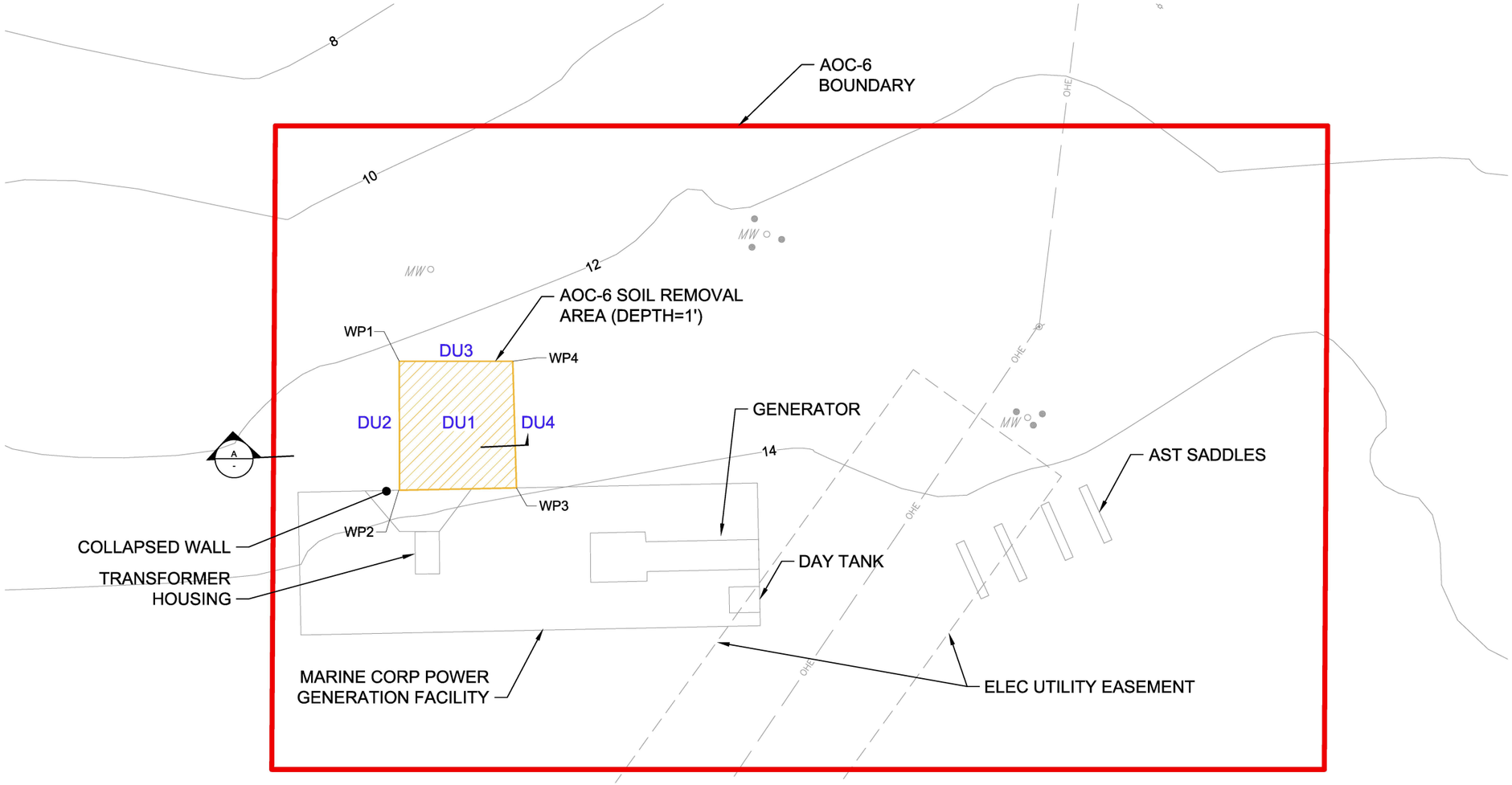
AOC-20 Location and Features

Date: December 2018

TIDEWATER COMMUNITY COLLEGE REAL ESTATE FOUNDATION
Suffolk, Virginia

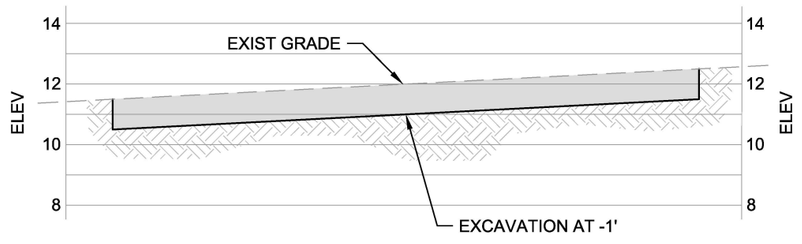
Figure: 4

HANA ENGINEERS & CONSULTANTS, LLC



PLAN

SCALE: 1" = 20'



PROFILE A

SCALE: 1" = 10' HORIZ, 1" = 5' VERT

N

0 20' 40'

NOTES:

1. HORIZONTAL DATUM IS NAD83 VA STATE PLANE SOUTH ZONE.
2. SOUTH WALL NOT SAMPLED DUE TO PRESENCE OF CONCRETE FOUNDATION FOR MCPG FACILITY.

Point Table		
Point #	Northing	Easting
WP1	3492189.70	12087563.08
WP2	3492168.52	12087562.99
WP3	3492168.91	12087582.30
WP4	3492189.70	12087581.67

HANA ENGINEERS & CONSULTANTS, LLC

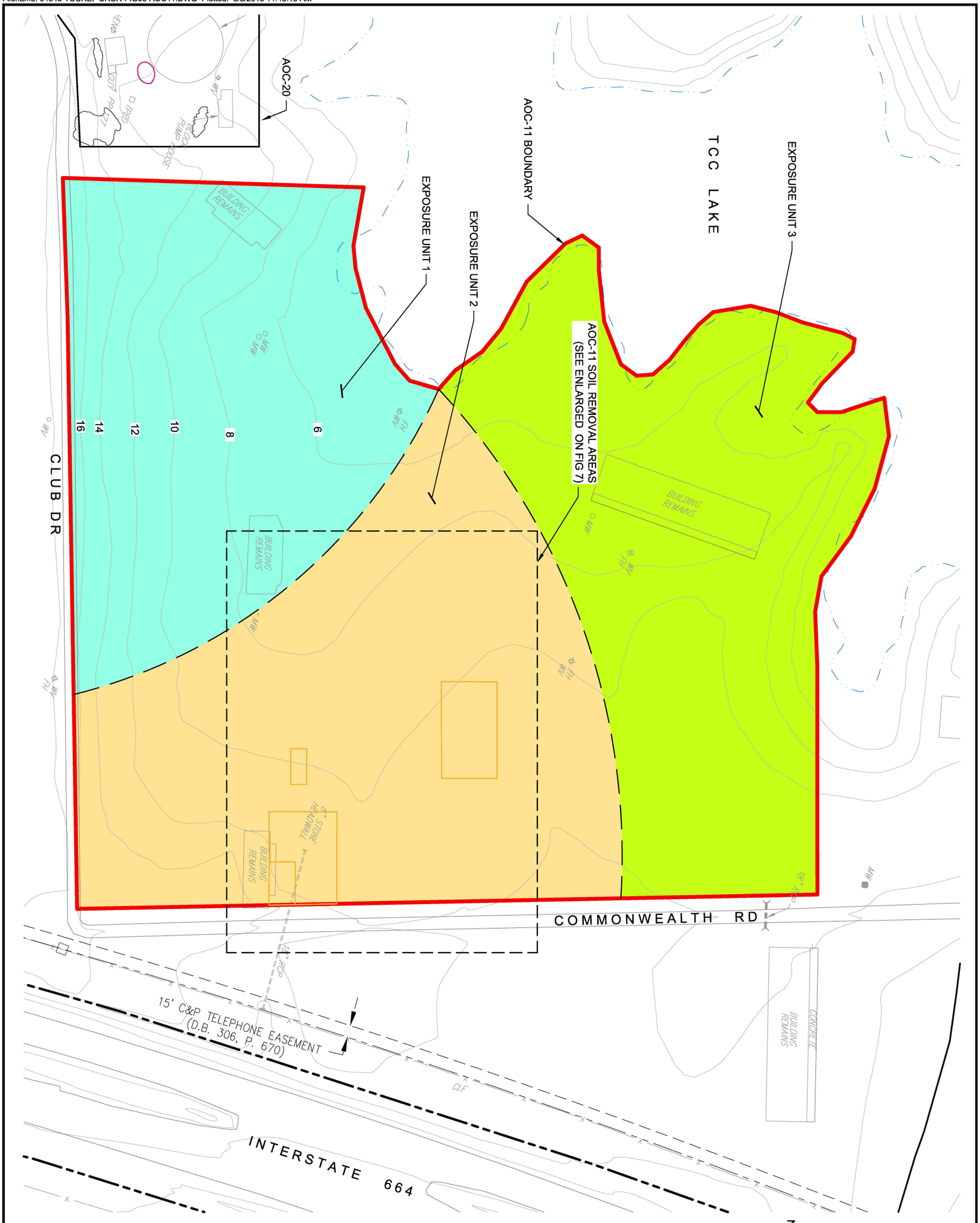
Figure: 5

AOC-6 ACTUAL EXCAVATION EXTENT

Tidewater Community College Real Estate Foundation
Soil Excavation and Removal Completion Report
TCCREF Parcel B, Suffolk, VA
Project No.: 64534 Date: December 2018

Filename: 64543-TCCREF SRCR-FIG05-AOC06.DWG Plotted: 3/23/2015 1:57:15 PM

Filename: 64543-TCCREF SRCR-FIG06-AOC11.DWG Plotted: 6/8/2018 11:43:15 AM

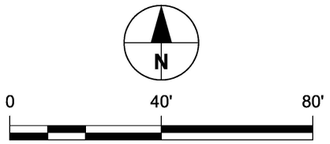


Tidewater Community College Real Estate Foundation
Soil Excavation and Removal Completion Report
TCCREF Parcel B, Suffolk, VA
Project No.: 64534 Date: December 2018

AOC-11 ACTUAL EXCAVATION EXTENT
OVERALL PLAN

HANA ENGINEERS & CONSULTANTS, LLC

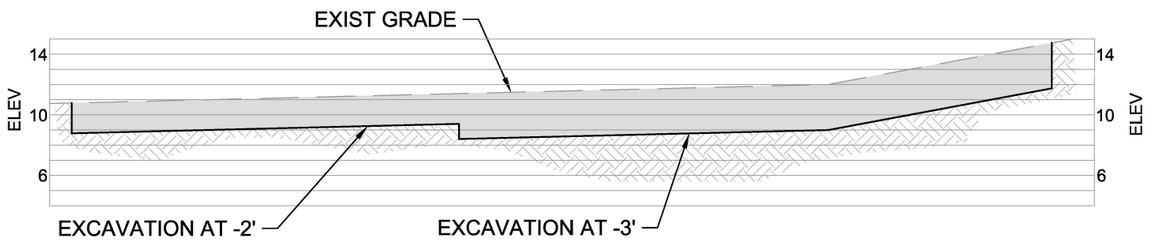
Figure: 6



NOTE:

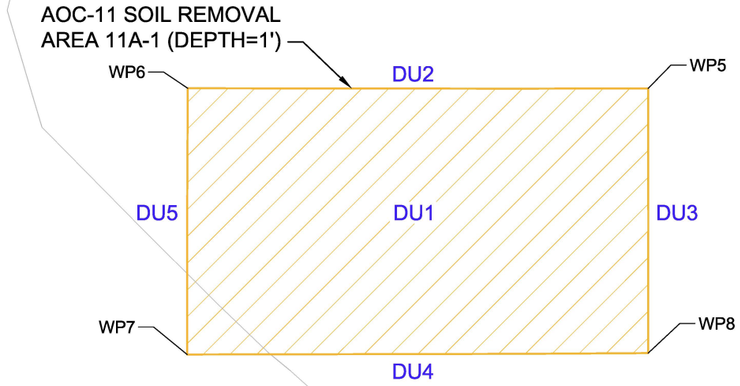
HORIZONTAL DATUM IS NAD83 VA STATE PLANE SOUTH ZONE

Point Table		
Point #	Northing	Easting
WP5	3493914.16	12089332.21
WP6	3493914.20	12089210.69
WP7	3493843.92	12089210.54
WP8	3493844.30	12089332.21
WP9	3493674.14	12089294.82
WP10	3493654.10	12089294.82
WP11	3493654.10	12089339.80
WP12	3493673.94	12089339.80
WP13	3493712.17	12089374.28
WP14	3493626.87	12089374.11
WP15	3493626.67	12089491.80
WP16	3493711.99	12089490.15
WP17	3493626.77	12089437.26
WP18	3493659.66	12089437.26
WP19	3493659.66	12089491.16



PROFILE B

SCALE: 1" = 20' HORIZ, 1" = 10' VERT



PLAN

SCALE: 1" = 40'

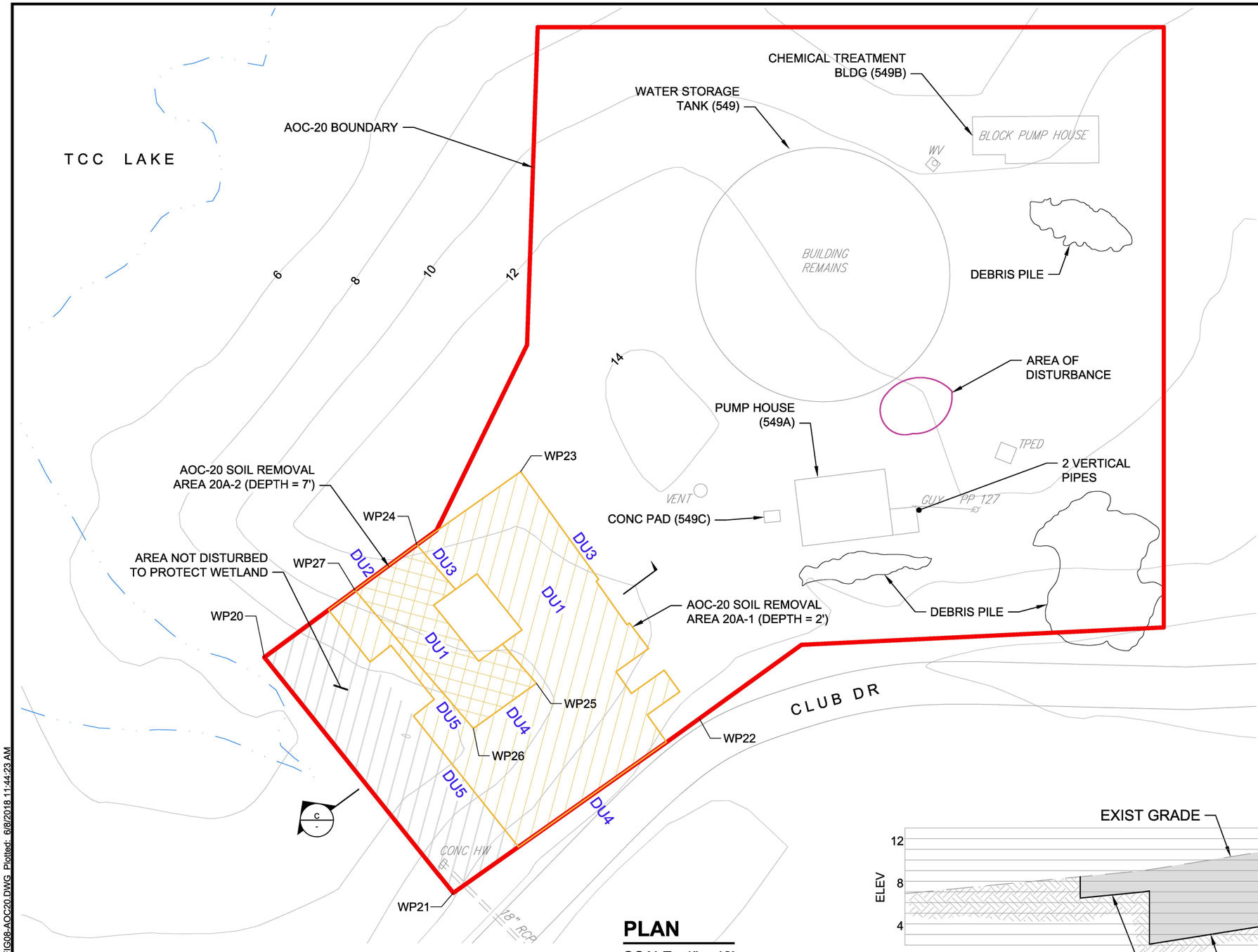
HANA
ENGINEERS & CONSULTANTS, LLC

Figure: 7

AOC-11 ACTUAL EXCAVATION EXTENT
EXPOSURE UNIT 2

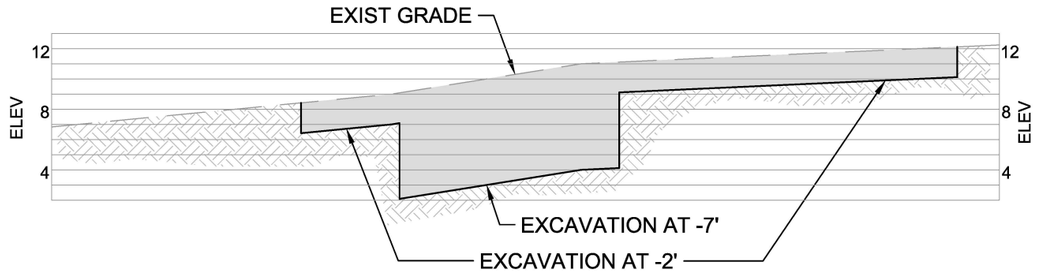
Tidewater Community College Real Estate Foundation
Soil Excavation and Removal Completion Report
TCCREF Parcel B, Suffolk, VA
Project No.: 64534 Date: December 2018

Filename: 64543-TCCREF SRCR-FIG07-AOC11-NLRGD.DWG Plotted: 6/8/2018 11:43:15 AM



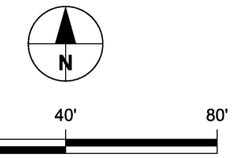
PLAN

SCALE: 1" = 40'



PROFILE C

SCALE: 1" = 20' HORIZ, 1" = 10' VERT



NOTE:

HORIZONTAL DATUM IS NAD83 VA STATE PLANE SOUTH ZONE

Point Table		
Point #	Northing	Easting
WP20	3493377.66	12088199.1456
WP21	3493289.17	12088270.0669
WP22	3493354.63	12088362.4370
WP23	3493447.45	12088295.3513
WP24	3493419.85	12088256.4764
WP25	3493367.91	12088301.2631
WP26	3493350.95	12088277.6072
WP27	3493402.82	12088233.2429

HANA ENGINEERS & CONSULTANTS, LLC

Figure: 8

AOC-20 ACTUAL EXCAVATION EXTENT

Tidewater Community College Real Estate Foundation
Soil Excavation and Removal Completion Report
TCCREF Parcel B, Suffolk, VA
Project No.: 64534 Date: December 2018

Filename: 64543-TCCREF SRCR-FIG08-AOC20.DWG Plotted: 6/8/2018 11:44:23 AM