DRAFT

WORK PLAN

FOR

TIME CRITICAL REMOVAL ACTION
AOC 32 – PCE UNDERGROUND STORAGE TANKS
AT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

CONTRACT NUMBER: N40085-12-D-1717
TASK ORDER: 0002

Prepared For:

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC
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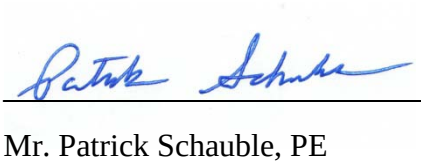
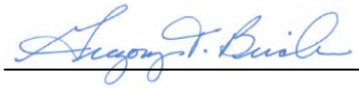
AUGUST 2012

By their signature, the following individuals certify their review and concurrence with this Work Plan for time critical removal action to be performed at the Naval Weapons Industrial Reserve Plant, Bethpage, New York.

Signatures	**Date**
	20 August 2012
Mr. Patrick Schauble, PE Program Manager	
	20 August 2012
Mr. Gregory Birch, PMP® Project Manager	

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FIGURES

APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

AOC	Area of Concern
APP	Accident Prevention Plan
bgs	below ground surface
CAMP	Community Air Monitoring Plan
CIH	Certified Industrial Hygienist
CO	Contracting Officer
DCE	dichloroethene
DER	Division of Environmental Remediation
DOT	Department of Transportation
H&S	H&S Environmental, Inc.
HSP	Health and Safety Plan
MIDLANT	Mid-Atlantic
MSDS	material safety data sheet
NAVFAC	Naval Facilities Engineering Command
NGC	Northrop Grumman Corporation
NERP	Navy/Marine Corps Environmental Restoration Program
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New State Department of Health
OSHA	Occupational Safety and Health Administration
PCE	tetrachloroethene
PE	Professional Engineer
PID	Photoionization Detector
PJM	Project Manager
PGM	Program Manager
PMP	Project Management Professional
POC	Point of Contact
PPE	personal protective equipment
RQ	reportable quantity
SAP	Sampling and Analysis Plan
SCO	Soil Clean-up Objective
SHM	Safety and Health Manager
SOW	Statement of Work
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SOP	Standard Operating Procedures
TBD	to be determined
TCE	trichloroethene
TCR	Time Critical Removal
Tetra Tech	Tetra Tech Inc.
UST	Underground Storage Tank
WMP	Waste Management Plan

1.0 INTRODUCTION

H&S Environmental, Inc. (H&S) has prepared this Work Plan for the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT) under Contract N40085-12-D-1717, Task Order 0002. This Work Plan describes the means, methods, and procedures required to remove two underground storage tanks (USTs) and contaminated soils located at Area of Concern (AOC) 32 within the Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York.

This Work Plan is based on the following documents/regulations:

- The Statement of Work (SOW) prepared by NAVFAC entitled *Time Critical Removal Actions Area of Concern 32 – PCE Underground Storage Tanks at NWIRP Bethpage, NY,* dated 7 May 2012.
- *New York State Department of Environmental Conservation (NYSDEC) CP-51 / Soil Cleanup Guidance, DEC Policy*, dated 21 October 2010.
- *NYSDEC Division of Environmental Remediation (DER) 6 NYCRR PART 375, Environmental Remediation Programs, Subparts 375-1 to 375- 4 & 375*-6, dated 14 December 2006.
- New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan* (December 2009).
- *Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites* outlined in NYSDEC's *DER-10 Technical Guidance for Site Investigation and Remediation* (May 2010).
- U.S. EPA Environmental Response Team, Standard Operating Procedures, Soil Sampling (SOP 2012) dated February 2000.

This Work Plan includes the tasks identified in the SOW. H&S will maintain and update this Work Plan as necessary during the course of work, based on the need to do so or at the direction of the Contracting Officer (CO) or authorized NAVFAC representative. This document is applicable to services performed by H&S as the prime contractor as well as any of H&S' subcontractors.

1.1 Project Objectives

The primary objectives of the project are to remove two USTs and to restore the site to existing grade. Tasks to be performed include:

Mobilization and Site Preparation

- Pre-Construction and Safety Meetings
- Excavation Permitting/Utility Clearance

- Collection and analysis of tank contents for liquid and solid waste characterization prior to mobilization.
- Mobilization of labor, equipment, and materials
- Installation of security measures (i.e., safety fence, safety signage)

UST Removal

- Removal of liquid and sludge from two USTs and connecting lines
- Stabilization of sludge removed from USTs
- Transportation and disposal of waste to an approved off-site facility
- Removal and decontamination of two 6,000-gallon steel USTs
- Off-site disposal/recycling of tanks, metal piping at the southern edge of tanks, concrete/asphalt and any associated structures
- Confirmation soil sampling

Site Restoration and Demobilization

- Capping of all connecting lines
- Backfill of tank excavations
- Grading of tank area and general site restoration
- Pre-Final Inspection / Punchlist / Final Inspection
- Demobilization of labor, equipment, and materials

1.2 Project/Site Information

NWIRP Bethpage was established in 1941 and was formerly a Government Owned Contractor-Operated facility that was operated by the Northrop Grumman Corporation (NGC) until September 1998. It is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City, covering approximately 109.5 acres.

The site's historical uses consist mainly of the research, prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. Historical operations that resulted in hazardous material generation at the facility included metal finishing processes, maintenance operations, painting of aircraft and components, and other activities that involved aircraft manufacturing.

Site 1 – Former Drum Marshalling Area originally consisted of two former drum marshalling pads that were used to store drums containing waste materials from operations at Plant 3 and potentially other sources at the facility. AOC 32 was closed by NGC in the 1980s. According to NGC's Phase I Environmental Site Assessment dated April 1997, there were two below ground

tetrachloroethene (PCE) bulk storage tanks that were identified at 1090 and 1091 used at Plant 3. In 1997 subsurface soil samples were collected and there were no exceedances of TAGM #4046 criteria. According to a NGC, in the mid-1980's, an above ground tank was constructed to hold the PCE and the use of the two underground tanks was abandoned. NGC's records indicate the two tanks stopped being used in January of 1984. Their records also indicate the tanks each have a capacity of 6,000 gallons and are constructed of steel. No other information is available regarding when the two tanks were installed or details of their abandonment.

In 2008, the majority of the facility was transferred to Nassau County for economic redevelopment and the remaining nine acres that the Navy retained under the cleanup program was leased to the County. The County sold the property and provided a sublease to Steel Equity in 2011. While grading the road that surrounds Plant 3, Steel Equity uncovered a UST man-way and two pipes that were used to transfer the PCE to Plant 3. Upon further investigation, it was determined that the UST manway was missing its cover. A second UST was also discovered in the same location. In addition, it appeared that the tanks were filled with sand but a void allowed a small amount of liquids to collect near the top of the tank. The liquid in one of the tanks was sampled; analytical results indicated elevated concentrations of vinyl chloride (19,000 ug/L), cis-1, 2-dichloroethene (cis-1,2-DCE) (22,000 ug/L), trichloroethene (TCE) (1,400 ug/L), and PCE (1,300 ug/L).

A general location of AOC 32, at the NWIRP Bethpage, Site 1 is shown in **Figure 1**. H&S has been tasked with performing the remedial action. H&S has engaged Tetra Tech Inc. (Tetra Tech) to provide technical support.

2.0 ORGANIZATION AND RESPONSIBILITIES

2.1 Organizational Structure and Staffing

An organizational chart showing the reporting relationships of personnel included in this Contract Task Order is provided as **Figure 2.**

Mr. Patrick Schauble, P.E. will serve as the Program Manager (PGM). Mr. Schauble and/or his delegates represent H&S in all matters related to the project.

Mr. Gregory Birch, PMP® has been assigned as Project Manager (PJM) and as the Point of Contact (POC) for this project. Mr. Birch is responsible for the execution of the project in accordance with the requirements contained in the SOW, this Work Plan, and the Health and Safety Plan (HSP).

Mr. Edward Kearney, CIH will serve as the Safety and Health Manager (SHM). Mr. Kearney is a Certified Industrial Hygienist (CIH) whose Safety and Health responsibilities include oversight of the development and approval of the Health and Safety Plan (HSP) and providing Safety and Health technical assistance to the PJM and Site Safety and Health Officer (SSHO).

Mr. John Hudacek will serve as the Site Superintendent (SS) and Site Safety and Health Officer (SSHO) on this project. The SS is responsible for ensuring that all field activities are conducted in conformance with the requirements contained in the Work Plan. The SSHO is responsible for the implementation of the HSP and for the coordination of safety activities with the NAVFAC representatives / Bethpage Facility Manager to ensure that the planned work objectives reflect adequate safety and health considerations.

2.2 Subcontractors and Suppliers

H&S will solicit and procure qualified subcontractors to perform onsite construction tasks, including but not limited, to site preparation, tank cleaning and removal, environmental compliance, and site restoration. The subcontractors will be responsible for submitting the necessary documentation regarding materials to be used for approval by H&S and NAVFAC. The subcontractors will be responsible for obtaining and complying with any required applicable permits.

H&S anticipates utilizing the following subcontractors and material suppliers for this project:

- Underground Utility Locator (TBD)
- Excavator and T&D Subcontractor: EQ Northeast, Inc.
- Disposal Facility: EQ Wayne Disposal Facility in Michigan (See **Appendix A** for Disposal Facility Information and permits)
- Clean Backfill Supplier (TBD)
- Environmental Consultant (Tetra Tech)
- Analytical Laboratory (Test America, Inc. Burlington, VT)

H&S will provide advance notice and, if required, obtain NAVFAC concurrence for each of these subcontractors/suppliers as they are procured.

3.0 REGULATORY AND PERMITTING CONSIDERATIONS

3.1 Safety and Health Requirements

H&S will comply with all applicable Occupational and Safety Health Administration (OSHA) and NAVFAC Safety and Heath requirements for this project. H&S has prepared a HSP, consisting of an Accident Prevention Plan (APP) and Site-Specific Health and Safety Plan (SSHP), under a separate cover that details the safety and health requirements to be implemented for OSHA compliance.

3.2 State and Local Requirements

H&S will comply with all state and local requirements applicable to the work to be performed under this Contract. H&S will contact the Facility Manager, Al Taormina, prior to any intrusive work onsite in order to locate all utilities and schedule a meeting with all interested parties that will potentially be affected by excavation activities. Any waste generated will be managed and disposed of in accordance with all applicable regulations.

4.0 WORK AREA CONSTRAINTS

4.1 Site Access / Traffic

H&S will coordinate with the Facility Manager to discuss any restriction for ingress and egress, traffic congestion and material delivery. Only nine acres of NWIRP Bethpage is under the control of the Navy; the balance has been sold and work is being conducted to revitalize the property.

H&S personnel will park privately owned vehicles in an area designated by Facility Manager and employee parking will not interfere with existing and established parking requirements.

Although a traffic control plan is not required, H&S will maintain and protect traffic on all affected roads during the construction period.

4.2 Proximity of Existing Structures

Due to the close proximity of existing structures, care will be taken to minimize disturbances to surrounding areas. Administrative and Engineering Controls including construction and safety signage, air monitoring ,and dust control will be utilized to minimize and the impact on surrounding operations and residences. Work will be performed during normal business hours (M-F 0700-1700) so as not to pose a nuisance to residents. Pre-and post-construction inspections will be conducted and photo-documented to ensure conditions are adequately protected.

4.3 Utility Location

Underground utility clearance will be completed prior to initiating intrusive activities. This will be completed using the following methods:

- Review of utility maps
- Marking the proposed limits of intrusive activity and the utility lines in the immediate vicinity, using color-coded surveyor paint.
- Performing a NY Dig Safe notification (72 hours in advance of intrusive activity)
- Use of geophysical methods, including electromagnetic induction, magnetometry, and/or ground-penetrating radar, to clear the proposed limit of intrusive activity of potential subsurface obstructions prior to soil excavation.
- Notifying the Facility Manager to schedule a meeting with all interested parties that will potentially be affected by excavation activities.

Special care will be taken during construction efforts to ensure that all work is conducted at least 10 feet away from any overhead utility lines.

5.0 PROJECT EXECUTION

This section describes the resources, means, and methods that H&S will apply to complete the work outlined in this Work Plan.

5.1 Project Management and Administration

The PJM, Mr. Gregory Birch, PMP®, will manage this project. He will utilize project support for safety management, cost and schedule, accounting, procurement, contract administration, and quality control from H&S' internal resources. Key members of the project staff for this task order are identified in Section 2.1, including the SS/SSHO. Field staffing during all onsite work activities will include the SS/SSHO on a full-time basis. The PJM will make periodic site visits to monitor the progress of the work for overall quality and project reporting.

The H&S PJM will maintain responsibility for overall task order performance, lead contact with the client regarding project contractual and financial matters, and will share responsibility for safety and quality performance with the field team.

5.2 Plans and Submittals

H&S has developed this Work Plan to encompass the various plans required for submittal under the SOW.

5.2.1 Health and Safety Plan

H&S has prepared an Accident Prevention Plan (APP) and Site Specific Health and Safety Plan (SSHP) specific to the field work in this task order, in accordance the Hazardous Waste Operations and Emergency Response (29 CFR 1910.120), the US Army Corps of Engineers Safety and Health Requirements Manual (COE EM 385-1-1), and the Navy/Marine Corps Environmental Restoration Program (NERP) Manual. The SSHP is a separate submittal from this Work Plan.

5.2.2 Community Air Monitoring Plan

H&S has prepared a Community Air Monitoring Plan (CAMP) to fulfill the requirements set forth by the NYSDOH Generic Community Air Monitoring Plan (December 2009) and the Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites (May 2010). The CAMP, included as **Appendix B**, is intended to provide for a measure of protection of the downwind communities (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne releases of constituents of concern during site activities. The CAMP will be implemented during intrusive activities such as the excavation and handling of contaminated soil (requiring continuous monitoring), as well as during non-intrusive activities such as the collection of soil samples (requiring periodic monitoring).

5.2.3 Waste Management Plan

A Waste Management Plan (WMP) describing the contractual, legal, and risk-management requirements in the generation, storage, transportation, treatment, and ultimate disposal of all waste for this SOW is included as **Appendix C**. The WMP is intended to ensure that waste

generated in the course of the fieldwork is safely managed and disposed of in accordance with all applicable laws and regulations. Sampling and analysis procedures for the purpose of waste characterization are described in Section 5.5.5.

5.3 Project Schedule

The remedial actions are scheduled to commence in September 2012 upon plan approval and proceed for duration of approximately two weeks. A preliminary schedule is included as **Figure 3**.

5.4 Pre-Construction Conference/Site Visit

H&S will attend a Pre-Construction Conference at the Bethpage Facility prior to mobilization. The purpose of the Pre-Construction Conference will be to review the Work Plan, HSP, and logistics with onsite personnel and site officials (including the Bethpage Facility Manager). Key members of the H&S field team will be present, including the PJM, SS/SSHO, and Subcontractor's Management.

5.5 Construction Tasks

5.5.1 Mobilization and Site Preparation

After all pre-mobilization submittals have been approved and the Pre-Construction Conference had been completed, H&S will mobilize required labor, equipment and materials to the job site including the SS/SSHO, equipment operators, and laborers. Subcontractors will mobilize to the site, as necessary, only after their respective submittals are approved and their readiness is confirmed.

Prior to mobilizing to the NWIRP Bethpage Site, the required NY Dig Safe notification (72 hours in advance) will be performed and review / mark-out the existing utilities in the area with a representative from the facility as described in Section 4.3 above. During this time, H&S will also meet with the contractor that is operating the existing Waste Management Area and identify the area which will be used for the temporary staging of waste material generated during the project. Samples of the waste (both liquid and solid) within the USTs will be collected prior to mobilization as described in Section 5.5.5 to establish waste profiles for each waste stream and determine whether or not waste streams are classified as hazardous.

During the initial mobilization of equipment to the project site, each piece of equipment will be fully inspected to ensure compliance with EM-385 and other pertinent requirements. The site manager will be informed of the scheduled arrival of equipment and invited to be present during the initial inspection a copy of which will be maintained at the project site. The equipment anticipated to be used at this project site may include:

- Rubber tire 38,000-lb class excavator
- Rubber tire skid steer
- 10 wheel roll off straight truck
- 20 cubic yard steel sealed, lined and covered roll off containers

- 20-ft ground bearing storage container
- Miscellaneous small tools and materials Site Layout

The site will be comprised of four separate areas:

- Storage Trailer / Material Lay Down Area
- Waste Management Area
- Access Road
- Excavation Area

The excavation area will be comprised of three zones:

- Exclusion Zone - The area of the site where there is an expectation that the materials are potentially contaminated. In this case that would be the area of active excavation and inside the actual excavation cell.
- Contamination Reduction Zone (CRZ) - The area of the site between the exclusion zone and the support zone will be considered to be the CRZ. In this project, the CRZ will be the area of excavation and the work area directly surrounding the excavation.
- Support Zone - The area located outside the CRZ and considered to be "clean." The support zone will consist of the area outside of the excavations work area.

Prior to initiating intrusive activities, H&S will perform the initial environmental monitoring of the project site the results of which will be used as a background during the work activities. This includes air monitoring as described in the CAMP **(Appendix B)**.

5.5.2 Environmental Protection and Erosion Controls

5.5.2.1 Site Maintenance

All operations will be conducted in a manor to minimize the impact on the surrounding residents. At the completion of work operations each day, all areas of the project site will be inspected and any debris or rubbish will be collected for proper handling. The active work area will be made safe with high-visibility orange fencing after each work day and during weekends, with appropriate signage in an effort to communicate the existing dangers to personnel transiting the areas adjacent to the work zone.

5.5.2.2 Decontamination

All project tasks will include appropriate decontamination procedures. During operations at the site, strict oversight will be maintained to prevent the cross-contamination of the site. This will include utilizing removal of dry, gross contamination at the source and the segregation of clean material trucks and material disposal trucks and equipment. All materials generated during the decontamination operation will be containerized and properly disposed of, as described in the WMP (**Appendix C**), with the balance of the impacted materials generated during operations. Several personnel decontamination stations will be set up throughout the site, including, at a minimum, the Excavation Area and Waste Management Area. Personnel decontamination stations will consist of the following:

- Self-contained portable sinks with an adequate supply of potable water, sanitizing agents and paper towels.
- A supply of new personal protective equipment (PPE) for use including disposable coveralls, gloves, and boot covers.
- Portable restroom facilities.

5.5.2.3 Spill Control and Fluid Management

Material Storage

All materials brought to the site will be stored in accordance with all applicable standards. All materials will be accompanied by a Material Safety Data Sheets (MSDS) which will be kept on file at the project site and available for review by all personnel on the site.

Labeling

All materials will be labeled properly in accordance with OSHA and DOT regulation. Compliance with OSHA Hazard Communication (29 CFR 1910.1200) will be maintained.

Inspection

All material storage locations on the Site will be inspected daily and inspections and any deficiencies/corrective actions will be noted on the Daily Report. Materials will be verified to be stored in the proper locations, labels intact, and MSDSs available. Some areas which will require daily inspections are:

- Chemical Storage Cabinet
- Parking Area
- Waste Management Area
- Heavy Equipment & Site Vehicles
- Temporary Restrooms
- General Site Area

Storage of Oils and Miscellaneous Chemicals

All miscellaneous chemicals and oils will be stored in an approved, rated steel cabinet designed for the storage of potentially hazardous materials. The storage cabinet will be locked during non-working hours. All materials as well as the exterior of the storage cabinet will be marked in accordance with applicable regulations.

Fuel Storage

A local supplier will be secured to deliver fuel directly to the equipment on the Site each day to avoid the need for onsite fuel storage. A small, licensed and inspected, (100-gallon) fuel storage cell mounted in a crew truck will also be utilized to allow for unplanned fuel shortages on the site. During all refueling operations, equipment will be de-energized prior to beginning fueling

operations. An appropriate quantity of absorbent materials and storage containers will be maintained on site to address unforeseen occurrences.

Transportation

Each vehicle used in the transportation of materials to or from the Site will be maintained in good working condition and free from any defects that may lead to a release of materials. During the loading of material, steps will be taken to avoid the spillage of materials. Roll-off containers and drums will be staged on heavy plastic sheeting prior to loading to contain any spillage of material. Areas around the containers and between the vehicles will also be inspected for evidence of any spills. All loads will be stabilized, secured, and covered prior to leaving the Site.

Spill Control

Spill Response

All project personnel will be trained to identify and begin corrective action should an unplanned event occur at the Site. Documentation of this site specific training will be maintained as part of the project file. In all instances, the SS will immediately inform the onsite representatives, including the Bethpage Facility Manager, of the situation and work together to ensure all corrective actions and notifications are made in an acceptable manor.

Small Spill

In the event of a small spill, appropriate actions will be taken to prevent the spill from reaching groundwater, surface water or drains.

Actions will include:

- Verification of spilled material, volume and hazards.
- Determine appropriate response procedures including PPE (see MSDS or Chemical Data Sheet).
- Assess quantity and size of the spill to determine the level of response to contain and clean it up.
- Confine or contain spill with booms, pads, or berm.
- Neutralize spill with appropriate agents (if safe/possible).
- Notify the Bethpage Facility Manager, SS, and PJM.
- Spilled material will be collected including absorbent material and placed in appropriate containers. All hazardous material shall be disposed of in accordance with all applicable hazardous waste regulations and client requirements, as described in the WMP (**Appendix C**).

Large Spill

A volume equal to or greater than State or Federal reportable quantity (RQ) and/or those beyond the capabilities and resources of on-site personnel defines large spills. Appropriate remedial actions will be conducted according to State and Federal Regulations.

General procedures are as follows:

- Verification of spilled material, volume and hazards.
- As safe to do so, confine the spill to the smallest area possible using booms, pads, berms or any other effective material.
- Assess type and extent of damages and injuries to personnel; take appropriate first aid steps if necessary.
- Notify the Bethpage Facility Manager, SS, and PJM.
- In the event the additional emergency clean-up assistance is needed, assistance from off-site response contractors may be requested.
- All emergency equipment will be decontaminated prior to being put back into service. Expendable or damaged supplies will be immediately replaced.

5.5.2.4 Erosion Control

Due to the extremely small size of this work area and the surrounding paved areas, 9-inch straw waddles will be utilized in place of silt fence around the excavation area. Excavated soil and backfill materials will be staged on and covered with plastic sheeting.

5.5.3 UST Cleaning and Excavation

Once the work area has been delineated and the protective barriers erected, the USTs will be uncovered by removing the overburden soil. The overburden material will be removed to a point approximately 1 foot below the top of the tank. All excavated material will be placed in lined 20-yard roll-off containers situated on plastic sheeting during loading. The tank covers will then be removed and the atmosphere tested in the tanks.

Based on a recent site inspection, free liquids inside the tanks are anticipated to be minimal with the majority of the tank contents consisting of saturated sand. Any free liquid inside the tanks will be pumped out into 55-gallon drums staged on plastic sheeting. Once free liquids are removed, tanks will be accessed by cold cutting the top of the tank using a shear or other non-spark producing device to allow access for the excavation of the saturated sand inside. Prior to cutting the top of the tank, the tank atmosphere will be monitored to ensure no explosion hazard exists.

Once the top of the tank has been removed, the saturated materials will be excavated into a lined, prepared 20-cy roll-off container and the material amended as necessary using cement dust or similar material. After each container is stabilized, the awaiting truck will transport the container to the existing Waste Management Area and return to the excavation with another 20-cy roll-off container. Drums of liquid waste will also be properly secured, labeled and placed in the Waste Management Area. This process will continue until all the materials have been removed from both of the USTs. Approximately 100 tons of stabilized material is anticipated to be excavated and containerized during this operation.

After all waste materials have been removed from the USTs, the interior of the tanks will be washed from an exterior position utilizing a 3,000-psi low volume/high-pressure washer. Detergents and long handled tools will be used to provide the gross removal and

decontamination of the tanks. The wash water will be collected and placed in 55 gal drums. Once this is completed the tanks will be removed from the ground and placed on a decontamination pad adjacent to the excavation.

Wash water generated from pressure washing the exterior of the tank will be collected on the decontamination pad. Waste liquids generated from decontamination activities will be managed in 55-gallon drums. In the event that free liquids removed from the tanks prior to cleaning are determined to be non hazardous, the decontamination liquids will be combined with the tank liquids, as appropriate. However, if it is determined that tank liquids are hazardous waste, then decontamination liquids will be characterized and managed separately.

Air monitoring and dust control measures will be employed daily, as detailed in the CAMP (**Appendix B**). H&S will set up and maintain a wetting system, if needed, for dust control. At the end of each work day, H&S will implement additional containment measures for dust control, including covering of any stockpiled materials where soil is exposed to wind. Any saw cutting of concrete that has the potential to release crystalline silica dust will be completed under wet conditions under strict adherence to the SSHP.

5.5.4 UST Removal

NYSDEC will be notified prior to UST removal. The USTs will be removed from the tank cavities carefully so as to avoid damage and care will be taken to excavate a minimum of material necessary to provide for the removal of the USTs. Once the USTs have been cleaned from the exterior, the tanks will be removed from the excavation and placed on a prepared area to allow for the sizing and any final decontamination prior to preparing the tanks for off-site recycling. Prior to recycling, the USTs will be cleaned to NYSDEC standards for USTs. Both USTs will be inspected, photographed, and documented following removal to determine whether leaks may have occurred. The tanks will then be wrecked to prevent reuse and transported off-site for disposal / recycling.

5.5.5 Sampling

Various sampling activities will be performed including the collection of waste characterization samples (both liquid and solid) and collection of soil samples beneath the excavated tanks to determine of any contamination is present beneath the tanks following removal of the tanks.

5.5.5.1 Waste Characterization Sampling

Sampling and analysis of the tank contents will be conducted prior to waste stabilization, transportation, and disposal so that the appropriate waste disposal facility can be identified prior to mobilization. If initial solid waste samples indicate that the waste is hazardous, subsequent post-stabilization samples will be collected as appropriate to determine if stabilization reduced the toxic characteristics of the waste. Waste characterization sampling will consist of the collection of up to two solid and two liquid samples (one from each UST). An additional sample of the decontamination liquids will be collected in the event that UST liquids are determined to

be hazardous. Waste material will be sampled in accordance with the standard operating procedures (SOPs) outlined in **Appendix D** and analyzed in accordance with U.S. EPA SW-846 analytical methods. Analytical results will be used to profile both liquid and solid waste streams and obtain acceptance approval at a suitable licensed disposal facility (described in the WMP [**Appendix C**]). **Table 1** summarizes the analytical parameters and methods that will be utilized for waste characterization sampling.

Table 1: AOC 32 Waste Characterization Sampling Table

Parameters	Matrix	SW-846 Methods
TCLP VOCs / VOCs	Solid/Aqueous	1311/8260B
TCLP Metals / Metals	Solid/Aqueous	1311/6010C/ 7471A/6020
TCLP SVOCs / SVOCs	Solid/Aqueous	1311/8270C
PCBs	Solid/Aqueous	8082
TPH	Solid/Aqueous	8015
Reactivity (Sulfide/Cyanide)	Solid/Aqueous	9034/9012A
Ignitability	Solid/Aqueous	1030
Pesticides	Solid/Aqueous	8081A
Herbicides	Solid/Aqueous	8151A

5.5.5.2 Soil Sampling

After removal of the USTs, soil samples will be collected from the tank cavities to determine whether a release of contaminants to the environment has occurred. Two discrete soil samples will be collected from the bottom of each tank cavity immediately below the tank footprint and analyzed for VOCs. A PID will be used to field screen the soils surrounding the tanks and sample collection locations will be biased towards VOC contamination based on these PID readings, field observation (stained soils, odor, etc.). If no contamination is evident, samples will be collected from the axis of the tank bottom; one sample will be collected from the location at 1/3 the length of each tank and one sample will be collected from the location at 2/3 the length of each tank. Samples will be collected using a TerraCore® sampler or equivalent and analyzed for VOCs by SW-846 Method 5035. All screening and sampling activities will be performed in accordance with the SOPs presented in **Appendix D**.

5.5.6 Site Restoration

Upon successful conformational sampling of the excavation area, the small diameter lines running to the south side of the excavation will be terminated and capped at their termination point. The excavation will be backfilled with clean native fill in 1-foot lifts with compaction to 90% proctor. Clean fill will either be certified as such or analytical testing will be performed in accordance with NYDEC DER 10 requirements to ensure fill is suitable. Compaction testing will be performed by a third-party company, a report of which will be included in the closeout documentation. Restoration of the excavation area will be completed by installing a six inch course of 1.25-inch clean stone at an elevation of six inches below ground surface (bgs). Final restoration of the area with pavement will be completed by others.

5.5.7 Demobilization

H&S will demobilize all labor, equipment and materials from the site upon completion of site restoration, pre-final inspection, punchlist items, and final inspection have been completed. Photographs of final site conditions will be taken for the closeout documentation.

5.6 Work Completion Documentation

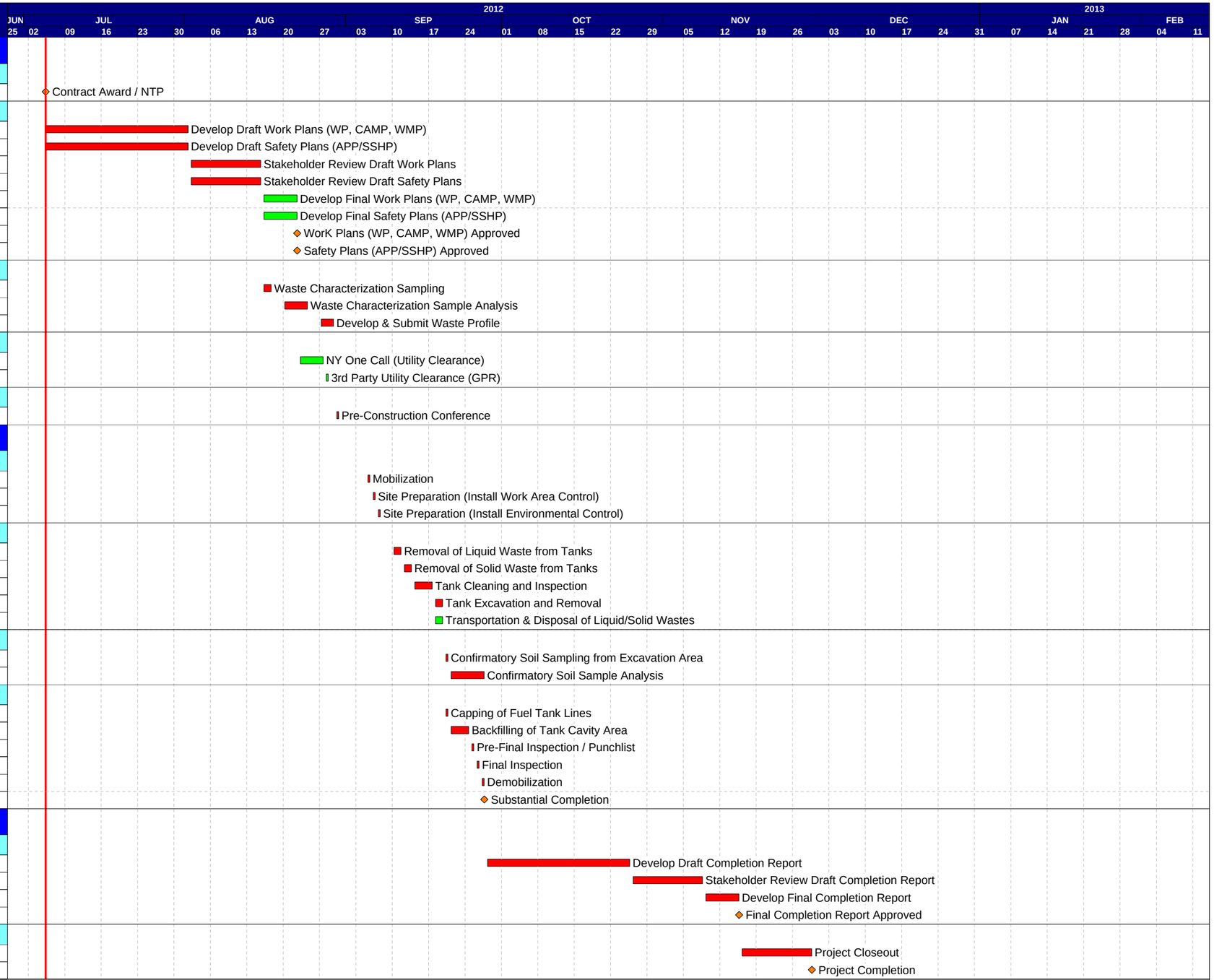
H&S will prepare a daily report for each day onsite including a brief narrative of what was accomplished, site conditions, subcontractors on site, issues encountered, or changes to this Work Plan. Daily Reports will be submitted to the Navy at the end of each workday during field work implementation.

Significant deviations or field change decisions made in execution of this Work Plan will be documented, including the rationale for the decisions and approvals obtained by the Navy prior to the deviation/field change.

H&S will also provide photographic documentation for conditions before, during, and after excavation and restoration work.

A Closure Report will be prepared to document all field activities and analytical data. The report will summarize closure activities and observations, present analytical results in a tabular format, and illustrate sample locations on site figure(s). All supporting documentation, such as sample logs, chains-of-custody, analytical reports, daily reports and photographs, will be included as appendices to the report. Soil sample data will also be uploaded to NIRIS.

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish
Pre-Construction Activities					
Contract Award					
1000	Contract Award / NTP	0	0	05JUL12	
Project Plans					
1010	Develop Draft Work Plans (WP, CAMP,	20d	20d	05JUL12	01AUG12
1020	Develop Draft Safety Plans (APP/SSHP)	20d	20d	05JUL12	01AUG12
1030	Stakeholder Review Draft Work Plans	10d	10d	02AUG12	15AUG12
1040	Stakeholder Review Draft Safety Plans	10d	10d	02AUG12	15AUG12
1050	Develop Final Work Plans (WP, CAMP,	5d	5d	16AUG12	22AUG12
1060	Develop Final Safety Plans (APP/SSHP)	5d	5d	16AUG12	22AUG12
1070	WorK Plans (WP, CAMP, WMP) Approved	0	0		22AUG12
1080	Safety Plans (APP/SSHP) Approved	0	0		22AUG12
Waste Characterization Sampling					
1090	Waste Characterization Sampling	2d	2d	16AUG12	17AUG12
1100	Waste Characterization Sample Analysis	5d	5d	20AUG12	24AUG12
1110	Develop & Submit Waste Profile	3d	3d	27AUG12	29AUG12
Utility Clearance / Mark Out					
1120	NY One Call (Utility Clearance)	3d	3d	23AUG12	27AUG12
1130	3rd Party Utility Clearance (GPR)	1d	1d	28AUG12	28AUG12
Pre-Construction Conference					
1140	Pre-Construction Conference	1d	1d	30AUG12	30AUG12
Construction Activities					
Mobilization / Site Preparation					
1150	Mobilization	1d	1d	05SEP12	05SEP12
1160	Site Preparation (Install Work Area Control)	1d	1d	06SEP12	06SEP12
1170	Site Preparation (Install Environmental	1d	1d	07SEP12	07SEP12
UST Cleaning, Excavation, and Removal					
1180	Removal of Liquid Waste from Tanks	2d	2d	10SEP12	11SEP12
1190	Removal of Solid Waste from Tanks	2d	2d	12SEP12	13SEP12
1200	Tank Cleaning and Inspection	2d	2d	14SEP12	17SEP12
1210	Tank Excavation and Removal	2d	2d	18SEP12	19SEP12
1215	Transportation & Disposal of Liquid/Solid	2d	2d	18SEP12	19SEP12
Confirmatory Soil Sampling					
1220	Confirmatory Soil Sampling from Excavation	1d	1d	20SEP12	20SEP12
1230	Confirmatory Soil Sample Analysis	5d	5d	21SEP12	27SEP12
Site Restoration / Demobilization					
1240	Capping of Fuel Tank Lines	1d	1d	20SEP12	20SEP12
1250	Backfilling of Tank Cavity Area	2d	2d	21SEP12	24SEP12
1260	Pre-Final Inspection / Punchlist	1d	1d	25SEP12	25SEP12
1270	Final Inspection	1d	1d	26SEP12	26SEP12
1280	Demobilization	1d	1d	27SEP12	27SEP12
1290	Substantial Completion	0	0		27SEP12
Post Construction Activities					
Project Completion Report					
1300	Develop Draft Completion Report	20d	20d	28SEP12	25OCT12
1310	Stakeholder Review Draft Completion Report	10d	10d	26OCT12	08NOV12
1320	Develop Final Completion Report	5d	5d	09NOV12	15NOV12
1330	Final Completion Report Approved	0	0		15NOV12
Project Closeout					
1340	Project Closeout	10d	10d	16NOV12	29NOV12
1350	Project Completion	0	0		29NOV12



Start date	05JUL12
Finish date	29NOV12
Data date	05JUL12
Run date	20AUG12
Page number	1A

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

FIGURE 3
Bethpage Tank Removal
Project Schedule

APPENDIX A
Waste Disposal Facility Information

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

REBECCA A. HUMPHRIES
DIRECTOR

September 30, 2010

Mr. Michael J. Takacs
Regulatory Specialist
EQ – The Environmental Quality Company
Wayne Disposal, Inc.
49350 North I-94 Service Drive
Belleville, Michigan 48111

Dear Mr. Takacs:

SUBJECT: Final Hazardous Waste Management Facility Operating License (License); Wayne Disposal, Inc. (WDI), Belleville, Michigan; MID 048 090 633

The Department of Natural Resources and Environment (DNRE), Environmental Resource Management Division (ERMD), has completed its review of the License renewal application from WDI. Based on that review and the results of the public hearing held on August 18, 2010, the DNRE has issued a License to WDI pursuant to Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The License renewal application review and the public participation procedures were conducted in accordance with Part 111.

Enclosed are copies of the License, Response to Comments, and Notice of Final Decision. If you have any questions or comments, please contact Mr. Peter Quackenbush, Hazardous Waste Section, ERMD, at 517-373-7397; quackenbushp@michigan.gov; or DNRE, P.O. Box 30241, Lansing, Michigan 48909-7741.

Sincerely,

Liane J. Shekter Smith, P.E., Chief
Environmental Resource Management Division
517-373-9523

Enclosures
cc: Mr. Scott Maris, EQ – The Environmental Quality Company
Ms. De Montgomery/Mr. Steve Buda, DNRE
Mr. Lawrence AuBuchon/Mr. Michael Busse, DNRE
Mr. Joseph Rogers, DNRE
Mr. Leo Parks, DNRE
cc/enc: Operating License File

State of Michigan
Department of Natural Resources and Environment
HAZARDOUS WASTE MANAGEMENT FACILITY OPERATING LICENSE

NAME OF LICENSEE: Wayne Disposal, Inc.

NAME OF FACILITY OWNER: EQ – The Environmental Quality Company

NAME OF FACILITY OPERATOR: Wayne Disposal, Inc.

NAME OF TITLEHOLDER OF LAND: Wayne Disposal, Inc.

FACILITY NAME: Wayne Disposal, Inc.

FACILITY LOCATION: 49350 North I-94 Service Drive
Belleville, Michigan 48111

EPA IDENTIFICATION (ID) NUMBER: MID 048 090 633

EFFECTIVE DATE: September 30, 2010

REAPPLICATION DATE: April 3, 2020

EXPIRATION DATE: September 30, 2020

AUTHORIZED ACTIVITIES

Pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), being §§324.11101 to 324.11153 of the Michigan Compiled Laws, and the hazardous waste management administrative rules (hereafter called the "rules") promulgated thereunder, being R 299.9101 *et. seq.* of the Michigan Administrative Code, by the Department of Natural Resources and Environment (DNRE), an operating license (hereafter called the "license") is issued to Wayne Disposal, Inc. (hereafter called the "licensee"), to operate a hazardous waste management facility (hereafter called the "facility") located at latitude 42° 13' 30" N and longitude 83° 31' 00" W. The licensee is authorized to conduct the following hazardous waste management activities:

☒ STORAGE	☐ TREATMENT	☒ DISPOSAL	☒ POSTCLOSURE
☐ Container	☐ Container	☒ Landfill	☐ Tank
☒ Tank	☐ Tank	☐ Land Application	☐ Surface Impoundment
☐ Waste Pile	☐ Surface Impoundment	☐ Surface Impoundment	☒ Landfill
☐ Surface Impoundment	☐ Incinerator		☐ Waste Pile
☐ Drip Pad	☐ Other:		

APPLICABLE REGULATIONS AND LICENSE APPROVAL

The conditions of this license were developed in accordance with the applicable provisions of the rules, effective March 17, 2008. The licensee shall comply with all terms and conditions of this license. This license consists of the 32 pages of conditions attached hereto (along with those in Attachments 1 through 16) and the applicable regulations contained in R 299.9101 through R 299.11008, as specified in the license. For purposes of compliance with this license, applicable rules are those that are in effect on the date of issuance of this license in accordance with R 299.9521(3)(a).

This license is based on the information in the license application submitted on October 12, 2006, and any subsequent amendments (hereafter referred to as "the application"). Pursuant to R 299.9519(11)(c), the license may be revoked if the licensee fails, in the application or during the license issuance process, to disclose fully all relevant facts or, at any time, misrepresents any relevant facts. As specified in R 299.9519(1), the facility shall be constructed, operated, and maintained in accordance with Part 111 of Act 451, the rules, and this license.

This license is effective on the date of issuance and shall remain in effect for 10 years from the date of issuance, unless revoked pursuant to R 299.9519 or continued in effect as provided by the Michigan Administrative Procedures Act, 1969 PA 306, as amended (Act 306). Pursuant to R 299.9516, this license shall be reviewed by the DNRE 5 years after the date of issuance and shall be modified as necessary in accordance with the provisions of R 299.9519 and R 299.9520.

Issued this 30th day of September

by Liane J. Shekter Smith

Liane J. Shekter Smith, P.E., Chief
Environmental Resource Management Division

HAZARDOUS WASTE MANAGEMENT FACILITY OPERATING LICENSE
FOR

WAYNE DISPOSAL, INC.
MID 048 090 633

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Attachment 15 Lysimeter Monitoring Program Sampling and Analysis Plan

Attachment 16 Sedimentation Basin Monitoring Program Sampling and Analysis Plan

APPENDIX B
Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN
FOR
TIME CRITICAL REMOVAL ACTIONS
AOC 32 – PCE UNDERGROUND STORAGE TANKS
AT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NUMBER: N40085-12-D-1717
TASK ORDER: 0002

Prepared For:

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC
9742 Maryland Avenue, Bld. Z-144
Norfolk, VA 23511

Prepared By:

160 East Main Street, Suite 2F
Westborough, MA 01581

AUGUST 2012

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ATTACHMENTS

LIST OF ABBREVIATIONS AND ACRONYMS

AOC	Area of Concern
CAMP	Community Air Monitoring Plan
DCE	dichloroethene
DER	Division of Environmental Remediation
H&S	H&S Environmental, Inc.
MIDLANT	Mid-Atlantic
NAVFAC	Naval Facilities Engineering Command
NGC	Northrop Grumman Corporation
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCE	tetrachloroethene
PID	photoionization detector
ppm	parts per million
TCE	tetrachloroethene
TCR	Time Critical Removal
UST	Underground storage tank

1.0 INTRODUCTION

H&S Environmental, Inc. (H&S) has prepared this Community Air Monitoring Plan (CAMP) for the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT) under Contract **N40085-12-D-1717** to be used during the removal of underground storage tanks (USTs) and contaminated soils located at Area of Concern (AOC) 32, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York.

This CAMP fulfills the requirements set forth by the New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan* (December 2009) and the *Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites* outlined by the New York State Department of Environmental Conservation (NYSDEC)'s Division of Environmental Remediation (DER) in *DER-10 Technical Guidance for Site Investigation and Remediation* (May 2010). The intent of this CAMP is to provide for a measure of protection of the downwind communities (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne releases of constituents of concern during site activities. NYSDOH requires the implementation of a CAMP for sites where ground intrusive activities, including the excavation and handling of contaminated soil, is performed, requiring real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area. As such, this CAMP specifies the potential air emissions, air monitoring procedures, monitoring schedule and data collection and reporting for the remedial activities to be conducted as described below.

2.0 SITE DESCRIPTION

NWIRP Bethpage was established in 1941 and was formerly a Government Owned Contractor-Operated facility that was operated by the Northrop Grumman Corporation (NGC) until September 1998. It is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City, covering approximately 109.5 acres.

The site's historical uses consist mainly of the research, prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. Historical operations that resulted in hazardous material generation at the facility included metal finishing processes, maintenance operations, painting of aircraft and components, and other activities that involved aircraft manufacturing.

Site 1 – Former Drum Marshalling Area originally consisted of two former drum marshalling pads that were used to store drums containing waste materials from operations at Plant 3 and potentially other sources at the facility. AOC 32 was closed by NGC in the 1980s. According to NGC's Phase I Environmental Site Assessment dated April 1997, there were two below ground tetrachloroethene (PCE) bulk storage tanks that were identified at 1090 and 1091 used at Plant 3. In 1997 subsurface soil samples were collected and there were no exceedances of TAGM #4046 criteria. According to a NGC, in the mid-80's, an above ground tank was constructed to hold the PCE and the use of the two underground tanks was abandoned. NGC's records indicate the two tanks stopped being used in January of 1984. Their records also indicate the tanks each have a capacity of 6,000 gallons and are made of steel. No other information is available regarding when the two tanks were installed, nor the process of their abandonment.

In 2008, the majority of the facility was transferred to Nassau County for economic redevelopment and the remaining nine acres that the Navy retained under the cleanup program was leased to the County. The County sold the property and provided a sublease to Steel Equity in 2011. While grading the road that surrounds Plant 3, Steel Equity uncovered a UST man-way and two pipes that were used to transfer the PCE to Plant 3. Upon further investigation, it was determined that the UST manway was missing its cover. A second UST was also discovered in the same location. In addition, it appeared that the tanks were filled with sand but a void allowed a small amount of liquids to collect near the top of the tank. The liquid in one of the tanks was sampled; analytical results indicated elevated concentrations of vinyl chloride (19,000 ug/L), cis-1, 2-dichloroethene (cis-1,2-DCE) (22,000 ug/L), trichloroethene (TCE) (1,400 ug/L), and PCE (1,300 ug/L).

2.1 Summary of Remedial Activities

Prior to mobilization, Samples of the waste (both liquid and solid) within the USTs will be collected as described in the Work Plan to establish waste profiles for each waste stream and determine whether or not waste streams are classified as hazardous.

Following mobilization and utility clearance, H&S will excavate and remove the two steel 6,000-gal USTs, render the tanks vapor free, and clean them of any residual liquids and sludge. All connecting lines will be drained, clean cut and capped.

After the USTs have been removed from the excavation, soil samples will be collected beneath the tanks in the tank cavity. Site restoration will include backfilling the excavation with suitable materials to match existing grades at the site. Materials used for backfilling will include the material stockpiles for re-use and material obtained from offsite sources.

Solid and liquid wastes generated from tank evacuation and cleaning will secured and staged in the Waste Management Area prior to proper offsite transportation and disposal at a licensed faculty as discussed below.

2.2 Potential Air Emissions Related to Remedial Action Activities

Certain remedial activities to be conducted at the site have the potential to generate localized impacts to air quality. These activities include:

- Soil Excavation
- UST Removal and Access
- UST Liquid and Solid Waste Removal
- UST and Equipment Decontamination
- Waste Staging and Stabilization
- Excavation Backfilling

Other non-intrusive activities which would be expected to a have a lesser impact on air quality include site setup, restoration, and vehicular traffic on site.

3.0 AIR MONITORING PROCEDURES

Real-time air monitoring will be implemented at the site for VOCs and particulate matter less than 10 microns in diameter (PM10). A site boundary will be established for the purpose of air monitoring. Upwind and downwind monitoring locations will be determined through visual observation (wind vane, windsock, or similar technique). Monitoring will occur at the UST excavation locations and will include the use of hand-held direct-reading survey instruments. Baseline air sampling will take place prior to the beginning of work.

3.1 Sampling Location Selection

Sampling activities will be determined daily based on visual observation of a wind direction. A single upwind location will be selected daily where both VOC and PM10 will be recorded. This upwind location will be established at the start of the workday, each day before the start of activities. Sampling activities will continue in a downwind direction throughout the day. If wind direction during the workday shifts greater than approximately +/-60 degrees from original upwind, then new upwind and downwind sampling locations will be established. Any location changes will be documented in the field logbook.

3.2 VOCs Monitoring

As required by the NYSDOH guidance, VOCs will be monitored continuously at the downwind perimeter of the immediate work area (i.e., the exclusion zone) during remedial site activities with instrumentation that is equipped with electronic data-logging capabilities. A photoionization detector (MiniRAE 3000 or equivalent) with a 10.2 eV lamp will be used to conduct the real-time VOC monitoring. Vinyl chloride monitoring will be performed if elevated VOC measurements are detected. **Attachment A** provides detailed information on the MiniRAE 3000. All 15-minute readings will be recorded, as well as any instantaneous readings taken to facilitate activity decisions.

3.3 Particulate Matter Monitoring

As required by the NYSDOH guidance, real-time particulate matter will be monitored continuously during site activities using instrumentation equipped with electronic datalogging capabilities and an audible alarm to indicate exceedance of the action level. A MIE DataRAM (or equivalent) will be used to conduct the realtime PM10 monitoring. **Attachment A** provides detailed information on the MIE DataRAM. All 15-minute readings will be recorded, as well as any instantaneous readings taken to facilitate activity decisions.

Fugitive dust migration will be visually assessed during all work activities, and reasonable dust suppression techniques will be used during any site activities that may generate fugitive dust, as described in Section 4.0 below.

3.4 Instrument Calibration

Calibration of the VOC and PM10 instrumentation will occur in accordance with each of the equipment manufacturer's calibration and quality assurance requirements. The VOC and PM10

monitors will be calibrated at least daily, and calibrations will be recorded in the field activity logbook.

3.5 Action Levels

The action levels provided below are to be used to initiate response actions, if necessary, based on real-time monitoring.

3.5.1 Action Levels for VOCs

As outlined in the NYSDOH guidance document for CAMPs, if the ambient air concentration of total VOCs exceeds 5 parts per million (ppm) above the background (upwind location) for the 15-minute average, intrusive site activities will be temporarily halted while monitoring continues. If the total VOC concentration readily decreases (through observation of instantaneous readings) below 5 ppm above background, then intrusive site activities can resume with continuous monitoring.

In addition, if VOC concentrations persist above 1 ppm above background, chemical specific real time testing will be performed (colorimetric tubes) to rule out the presence of vinyl chloride. Intrusive work will be halted if vinyl chloride concentrations persist above 1 ppm (OSHA permissible exposure limit).

If the ambient air concentrations of total VOCs persist at levels in excess of 5 ppm above background but less than 25 ppm above background or if vinyl chloride persists above 1 ppm, intrusive site work activities will be halted, the source of the elevated VOC concentrations identified, corrective actions to reduce or abate the emissions undertaken, and air monitoring will be continued. Once these actions have been implemented, intrusive site work activities can resume provided the following two conditions are met:

- The 15-minute average VOC concentrations remain below 5 ppm above background.
- The VOC level 200 feet downwind of the sample location, or half the distance to the nearest potential receptor or residential/commercial structure (whichever is less but in no case less than 20 feet), is below 5 ppm over background for the 15-minute average.
- Vinyl chloride concentrations remain below 1 ppm.

If the ambient air concentrations of total VOCs are above 25 ppm above background or if vinyl chloride persists above 1 ppm, the intrusive site activities must cease, and emissions control measures must be implemented, as described in Section 4.0 below.

Periodic monitoring for VOCs is required during non-intrusive activities such as collection of soil samples, or equipment decontamination. If these activities are undertaken at the site, ambient direct-reading (instantaneous) VOC data will be periodically collected at the location of the non-intrusive activity and recorded in the field activity logbooks.

3.5.2 Action Levels for Particulate Matter

As required by the NYSDOH guidance, if the ambient air concentration of PM10 at any one or more of the sampling locations is noted at levels in excess of 100 micrograms per cubic meter ($\mu g/m^3$) above the background (upwind location), or if airborne dust is observed leaving the work area, intrusive site activities will be temporarily halted. The source of the elevated PM10 concentration is to be identified, corrective actions to reduce or abate the emissions will be undertaken, and air monitoring will continue.

Work may continue following the implementation of dust suppression techniques provided the PM10 levels do not exceed 150 $\mu g/m^3$ above background.
If, after implementation of dust suppression techniques, PM10 levels are greater than 150 μg/m3 above background, work must be stopped and site activities must be reevaluated. Work may only resume provided that the dust suppression measures and other controls are successful in reducing PM10 levels less than 150 $\mu g/m^3$ above background and in preventing visible dust from leaving the site. If the ambient air concentration of PM10 is above 150 $\mu g/m^3$ above background, the intrusive site activities must cease and emissions control measures must be implemented, as described in Section 4.0 below.

4.0 EMISSION CONTROL MEASURES

4.1 Vapor / Odor Suppression Techniques

Vapor and odor suppression techniques must be employed when action levels warrant the use of these techniques. As an initial method of vapor and odor suppression, excavation will be limited to favorable wind and temperature conditions to minimize off-site migration. In addition, polyethylene sheeting will be used to cover stockpiles, as needed.

If action levels are exceeded due to remedial activities, engineering controls such as exhaust pollution control devices will be used to reduce air emission levels to within acceptable levels. Canisters of air phase granular activated carbon could be used to reduce air emission levels under these circumstances.

Another possible technique to be implemented for control of volatile organic odors from stockpiled soil loaded trucks or the excavation will be the application of a hydro-mulch material or an encapsulating foam sealant. The hydro-mulch material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch or the encapsulating sealant may be sprayed over open excavation areas, temporary stockpile areas, drying beds and loaded trucks, as necessary, thus sealing the release of odors immediately at the source. Additional steps for odor control around the excavation may include the installation and operation of a water curtain.

4.2 Dust Suppression Techniques

Reasonable dust-suppression techniques must be employed during all work that may generate dust, such as excavation, grading, placement of clean fill, and loading of contaminated soils. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces
- Spraying water on buckets during excavation and dumping
- Applying water on haul roads (if applicable)
- Hauling materials in properly covered containers
- Restricting vehicle speeds to 10 mph
- Covering excavated areas and material after excavation activity ceases

Experience has shown that the chance of exceeding the 150 ug/m^3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

5.0 MONITORING SCHEDULE AND DATA COLLECTION AND REPORTING

5.1 Monitoring Schedule

Real-time VOC and PM10 monitoring will be performed continuously throughout the remedial action during intrusive site/materials handling activities. VOC monitoring will also be performed during non-intrusive sampling and/or support-type activities such as soil sample collection. Wind direction will be determined at the start of each day and at any other appropriate time during remedial activities.

5.2 Data Collection and Reporting

Air monitoring data will be collected continuously from VOC and PM10 monitors during intrusive site activities by an electronic data-logging system. The data management software will be set up so that instantaneous observed readings would be recorded by the electronic data acquisition system and averaged over 15-minute time periods. The 15-minute readings and instantaneous readings taken to facilitate activity decisions will be recorded and archived for review by NYSDOH and NYSDEC personnel.

Attachment A

Monitoring Equipment Specifications

MiniRAE 3000 - RAE Systems

Home » Products » Air Monitoring » Photoionization Detector » RAE Systems MiniRAE 3000

The MiniRAE 3000 is the most advanced handheld volatile organic compound (VOC) on the market. Its Photoionization Detector's (PID) extended range of 0 to 15,000 ppm makes it an ideal instrument for applications from industrial hygiene, to leak and hazmat detection..

The RF modem allows real-time data transmissions with a base controller located up to 500 feet away from the MiniRAE 3000 detector. A personal computer can be used as the base station for a Mini-RAE 3000 system. The standard ProRAE Remote software is capable of monitoring the input of up to 64 remotely-located monitors like MiniRAE 3000, or AreaRAE, etc.

Key Features

- **Proven PID technology**
  The patented sensor provides the following unique features:
  - a 3-second response time
  - extended range up to 15,000 ppm with improved linearity
  - humidity compensation with inbuilt humidity and Temperature sensors
- **Real-time wireless** data transmission with built-in RF modem or Bluetooth.
- **Design for service** Easy access to lamp and sensor in seconds without tools.
- **Big Graphic display** for easy overview of gas type, Correction Factor and concentration.
- **Field interchangeable battery pack** in second's without tools.
- **Integrated Flash Light** for better view in dark conditions.
- **User friendly screens including plot view chart view.**
- **Inbuilt full RAE Systems 350 compounds correction factors list** measure more chemicals than any other PID.
- **Multilanguage support** with 10 languages encoded.
- **Rugged housing** withstands use in harsh environments:

- IP67 Waterproof design for easy cleaning and decontamination in water
- b protective removable Rubber Boot.

Additional Advantages

- View real-time sensor data and alarm status at headquarters or command Center
- Automatic lamp type recognition
- Duty-cycling™ lamp and sensor autocleaning technology
- Tough, flexible inlet Flexi-Probe™
- Large 3 keys operable with 3 layers of gloves
- b, built-in sample pump draws up to 100 feet (30m) horizontally or vertically
- Loud 95 dB audible alarm
- Bright red flashing visual alarm
- Interchangeable Drop-In Lithium-ion and alkaline battery packs
- Charging cradle doubles as an external battery charger
- Compatible with AutoRAE™ calibration station
- ProRAE Remote software simultaneously controls and displays readings for up to 64 remote detectors
- License free, ISM band RF transmission with communication range up to 500 feet 2 miles (with optional)
- Optional RAELink III modem provides GPS capability to track and display readings from remote detectors as well as 2 miles long distance transmission
- Data logging with up to 6 months of data at one-minute intervals
- 3-year 10.6eV lamp Warranty

- Huge screen (can display data in graphical format as well)
- Built-in temperature and humidity compensation sensor for improved accuracy
- Extremely improved user interface (menus are very intuitive)
- Increased range 0.1 to 15,000ppm in 0.1ppm increments
- Detector response time of <3 seconds to changes in concentration
- USB or optional Bluetooth connections for data download
- IP rating of 67 when turned off (very easy to decon), IP65 when running
- Li-Ion or Alkaline battery packs (very easy swap in the field with no tools)
- Built-in 2 lamp LED flashlight
- Includes over 200 chemical correction factors in memory and even a ‘My List’ of favorites
- Automatic recognition of 11.7eV and 9.8eV lamps (the 10.6eV lamps still come with a 3 year warranty, and are interchangeable with the MiniRAE 2000)

Monitor only includes:
- MiniRAE 3000 Monitor, Model PGM-7320
- Datalogging with ProRAE Studio Package for Windows 95, 98, 2000, NT, ME & XP
- Charging/download adapter
- RAE 10.6eV lamp, 9.8eV or 11.7eV optional if specified
- Flex-I-Probe
- External filter
- Protective rubber boot

- Alkaline battery adapter
- Lamp cleaning kit
- Tool Kit
- Rechargeable Lithium-Ion (Li-Ion) battery
- Operation & Maintenance manual & CD-ROM
- Soft leather carrying case

Accessory Kit adds:
- Hard transport case with pre-cut foam
- Charging/download cradle (instead of Charging/download adapter)
- 5 porous metal filters and o-rings
- Organic vapor zeroing kit
- Gas outlet port adapter and tubing

Calibration Kit further adds:
- 100ppm isobutylene cal gas, 34 liter cylinder
- Calibration regulator & flow controller

Thermo MIE DR-4000

Home » Products » Air Monitoring » Aerosol Monitors » Thermo MIE DR-4000

With the DataRAMTM, you'll never again have to wait for laboratory results to assess whether airborne pollutants have reached dangerous levels. The DataRAM Real-Time Aerosol Monitor measures mass concentrations of airborne dust, smoke, mists, haze, and fumes and provides continuous real-time readouts. Large capacity onboard data logging capability lets you save concentration data for future analysis. With optional accessories, the DataRAM can also provide respirable, PM-2.5, or PM-10 correlated measurements. For exposure sampling or continuous unattended indoor air, ambient, duct, or process monitoring, no other aerosol monitor is as fast, accurate, and easy to use as the DataRAM.

Designed for High Sensitivity

A high-sensitivity nephelometric monitor, the DataRAM samples the air at a constant, regulated flow rate by means of a built-in diaphragm pump. The DataRAM's light scattering configuration is optimized for the measurement of airborne particle concentrations, maximizing the unit's sensitivity. The detected signal is processed by state-of-the-art lock-in circuitry followed by high-resolution digitization, achieving ultimate detectability of atmospheric Rayleigh scattering fluctuations.

The Widest Measurement Range of Any Real-Time Particulate Monitor

In addition to its high sensitivity, the DataRAM has the widest measurement range of any real-time aerosol monitor-from 0.0001 mg/m3 (0.1µg/m3) to 400 mg/m3 . With a total span of almost 7 decades, the DataRAM is capable of effectively, measuring mass concentrations of airborne particles in industrial and ambient environments ranging from exceptionally pristine to extremely polluted. The instrument can also be used for atmospheric visibility measurements over a wide range of scattering coefficients. (0.00015 to 600 km -1). The DataRAM's auto-ranging digital display provides both real-time and time averaged concentrations.

Exceptional Long-Term Stability

The DataRAM incorporates several technological advances which guarantee exceptional long-term stability. Near infrared source output feedback control provides drift-free operation and excellent temperature stability. For either manual or preprogrammed/automatic zeroing of the monitor, an electronically controlled latching solenoid valve diverts the entire filtered air stream though the optical sensing stage in order to achieve "zero" air reference. In addition, instrument span checks (secondary calibration) can be performed simply by turning a knob on the DataRAM's back panel, which inserts a built-in optical scattering/diffusing element into the filtered air stream. On-screen diagnostic indicators and automatic shut-off for low battery conditions also help ensure the monitor's correct operation and data storage.

Maintenance-Free Operation

After passing through the optical sensing stage, all the particles are retained on a HEPA filter. Part of the filtered air stream is then continuously diverted through and over all optically-sensitive areas (lens, light traps, etc.) to form a continuous air curtain which protects against particle deposition. This design, in conjunction with a highly reliable diaphragm pump, ensures long-term maintenance-free operation. A membrane filter (with special holder included) can be substituted for the HEPA cartridge for gravimetric and/or chemical analysis of the particles collected downstream of the sensing stage.

Menu-Driven Information Displays

In addition to the auto-ranging real-time concentration readout, the DataRAM provides users with a variety of informational displays on its 8-line LCD screen. Real-time and date, time-weighted average concentrations, elapsed run times, and other information are easily viewed by selecting the appropriate screen using a scroll-through menu. Operating parameters and diagnostic information displays can also be easily accessed through the menu using only 6 keys on the front of the instrument.

Integral Large-Capacity Data Logger

The DataRAM has built-in large-capacity data logging capabilities. Stored information includes time and date, average concentrations, maximum and minimum values over selected periods, STEL concentration, and tagging codes. Logged information can be retrieved either by scrolling through the DataRAM's display or by down-loading to an external device such as a personal computer or printer.

Digital, Analog, and Alarm Outputs

The DataRAM provides continuous digital output (by means of an RS232C data port) as well as analog output, and a switched output for selectable high-level alarm with a built-in audible signal.

Accessories Expand Versatility and Enhance Accuracy

Several optional accessories are available for use with the DataRAM for a wide range of sampling applications. A cyclone precollector allows respirable particle measurements. An omni

directional air sampling inlet (with or without a PM-10/2.5 head) is available for ambient monitoring. Isokinetic inlet nozzles are available for duct sampling. An in-line heater module allows accurate monitoring of solid particles in high humidity/fog conditions. A sample dilution accessory permits elevated temperature and/or very high concentration monitoring. To down-load data to a PC or laptop any standard seial communications software package (e.g. Microsoft WindowsTM 3.1) can be used. Standard spreadsheet packages (such as Microsoft ExcelTM, LotusTM, and others) can easily access and analyze data log files transmitted to a PC for review and archiving. A portable battery-powered printer and cabling accessories are also available.

Standard accessories included:

- Universal voltage battery charger
- Standard HEPA filter cartridge
- Analytical filter holder
- PC communications software disk
- Digital output cable
- Carrying case
- Instruction manual

APPENDIX C
Waste Management Plan

DRAFT

WASTE MANAGEMENT PLAN

FOR

TIME CRITICAL REMOVAL ACTION (TCRA)
AREA OF CONCERN 32 – PCE UNDERGROUND STORAGE TANKS
WASTE MANAGEMENT PLAN
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK

CONTRACT NO. N40085-12-D-1717.
TASK ORDER NO. 0002

Prepared for:

Department of the Navy
Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT)
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Building Z-144
Norfolk, VA 23511

Prepared By:

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AUGUST 2012

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LIST OF ABBREVIATIONS AND ACRONYMS

AOC	Area of Concern
CKD	cement kiln dust
CY	cubic yard
DCE	dichloroethene
H&S	H&S Environmental, Inc.
IDW	investigative-derived waste
MIDLANT	Mid-Atlantic
NAVFAC	Naval Facilities Engineering Command
NGC	Northrop Grumman Corporation
NWIRP	Naval Weapons Industrial Reserve Plant
PCE	tetrachloroethene
TCE	tetrachloroethene
TCR	Time Critical Removal
UST	Underground storage tank
WMP	Waste Management Plan

1.0 INTRODUCTION

H&S Environmental, Inc. (H&S) has prepared this Waste Management Plan (WMP) for the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT) under Contract N40085-12-D-1717, Task Order 0002. This WMP describes the contractual, legal, and risk-management requirements in the generation, storage, sampling and analysis, waste typing, transportation, treatment, and ultimate disposal of all wastes associated with the Time Critical Removal Action (TRCA) of two underground storage tanks (USTs) and contaminated soils located at Area of Concern (AOC) 32 located within the Naval Weapons Industrial Reserve (NWIRP) Bethpage, New York. The purpose of this WMP is to ensure that waste generated in the course of the fieldwork is safely managed and disposed in accordance with all applicable laws and regulations. The WMP will cover both wastes to be remediated under this task order and investigative-derived waste (IDW) generated in the performance of the remedial action. All waste removal activities will be conducted so as to prevent disturbance of adjacent work activities, completed work areas, and the general public.

1.1 Site Description

NWIRP Bethpage was established in 1941 and was formerly a Government Owned Contractor-Operated facility that was operated by the Northrop Grumman Corporation (NGC) until September 1998. It is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City, covering approximately 109.5 acres.

The site's historical uses consist mainly of the research, prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. Historical operations that resulted in hazardous material generation at the facility included metal finishing processes, maintenance operations, painting of aircraft and components, and other activities that involved aircraft manufacturing.

Site 1 – Former Drum Marshalling Area originally consisted of two former drum marshalling pads that were used to store drums containing waste materials from operations at Plant 3 and potentially other sources at the facility. AOC 32 was closed by NGC in the 1980s. According to NGC's Phase I Environmental Site Assessment dated April 1997, there were two below ground tetrachloroethene (PCE) bulk storage tanks that were identified at 1090 and 1091 used at Plant 3. In 1997 subsurface soil samples were collected and there were no exceedances of TAGM #4046 criteria. According to a NGC, in the mid-80's, an above ground tank was constructed to hold the PCE and the use of the two underground tanks was abandoned. NGC's records indicate the two tanks stopped being used in January of 1984. Their records also indicate the tanks each have a capacity of 6,000 gallons and are made of steel. No other information is available regarding when the two tanks were installed, nor the process of their abandonment.

In 2008, the majority of the facility was transferred to Nassau County for economic redevelopment and the remaining nine acres that the Navy retained under the cleanup program was leased to the County. The County sold the property and provided a sublease to Steel Equity in 2011. While grading the road that surrounds Plant 3, Steel Equity uncovered a UST man-way and two pipes that were used to transfer the PCE to Plant 3. Upon further investigation, it was determined that the UST man way was missing its cover. A second UST was also discovered in the same location. In addition, it appeared that the tanks were filled with sand but a void allowed a small amount of liquids to collect near the top of the tank. The liquid in one of the tanks was sampled; analytical results indicated elevated concentrations of vinyl chloride (19,000 ug/L), cis-1, 2-dichloroethene (cis-1,2-DCE) (22,000 ug/L), trichloroethene (TCE) (1,400 ug/L), and PCE (1,300 ug/L).

1.2 Summary of Remedial Activities

Prior to mobilization, Samples of the waste (both liquid and solid) within the USTs will be collected as described in the Work Plan to establish waste profiles for each waste stream and determine whether or not waste streams are classified as hazardous.

Following mobilization and utility clearance, H&S will excavate and remove the two steel 6,000-gal USTs, render the tanks vapor free, and clean them of any residual liquids and sludge. All connecting lines will be drained, clean cut and capped.

After the USTs have been removed from the excavation, soil samples will be collected beneath the tanks in the tank cavity. Site restoration will include backfilling the excavation with suitable materials to match existing grades at the site. Materials used for backfilling will include the material stockpiles for re-use and material obtained from offsite sources.

Solid and liquid wastes generated from tank evacuation and cleaning will secured and staged in the Waste Management Area prior to proper offsite transportation and disposal at a licensed faculty as discussed below.

2.0 WASTE HANDLING

2.1 Solid and Liquid Waste within USTs

During the initial discovery of the USTs and during the subsequent sampling of the USTs, it was noted that the tanks were filled with sand and a liquid was observed and sampled from the open head space at the top of the tanks. The results of the sampling suggest that the waste stream will include both saturated sand and liquids containing vinyl chloride, DCE, TCE, and PCE as well as lesser constituents.

Steel 55-gallon drums will be utilized to containerize liquid wastes. Liquids will be pumped from the USTs into drums staged on pallets and plastic sheeting to avoid any spills. Drums will be properly labeled and secured.

Due to the saturated nature of the material and the lack of a suitable area for stockpiling, the contents of the USTs will be excavated directly into 20-CY lined, sealed and covered roll off containers. Prior to loading the material, one ton of cement kiln dust (CKD) will be placed in each container to stabilize the saturated material and absorb the free liquids. The material will be processed until it meets the paint filter criteria required for transportation. A portable truck scale will be provided at the project site in an effort to maximize the loading of each container.

After each container is loaded and stabilized, the container will be transported to the existing onsite Waste Management Area and stored awaiting transportation to the disposal facility. Each container will be lined, sealed and covered. Drums of waste liquid will also transported to the Waste Management Area. A waste profile and sample shipping documents (non hazardous or hazardous waste manifests depending on characterization sample results) will be prepared and submitted to the appropriate NAVFAC representative for review, acceptance and signature prior to transporting the waste material from the project site, as described below.

2.2 Potential Excavated Soil

Soil surrounding each UST will be excavated only as required to remove the tanks. Excavated soil will be placed in roll-off containers. Each container will be lined, sealed and covered. Upon receipt and review of the sampling results, a determination will be made on the disposition of these soils.

2.3 Debris (USTs, steel piping, etc.)

Construction debris will be generally sorted in real time on site into categories for respective recycling/disposal. In general, the categories will be stocked in distinct piles on site. Categories may include:

- Construction Debris - Disposed off-site.

- Metal – Recycled off-site.

Debris containers will be located by H&S at appropriate areas at the site. The containers will be removed from the site at the end of removal activities. The waste will either be recycled as above or transported to local Subtitle D landfill for disposal.

2.4 Garbage

Garbage containers will be located by H&S at appropriate areas at the site. Various onsite containers used for non-hazardous wastes (i.e. household trash) will be placed into dumpsters. Dumpster garbage will be picked up as required; garbage waste will be transported to the appropriate landfill. All garbage and debris will be removed from the site prior to demobilization.

2.5 Sewage Wastes

A portable toilet will be used on site for temporary toilet facilities. The portable toilet will be pumped out weekly or as needed.

3.0 MANIFEST PREPARATION

H&S will prepare manifests for the transportation and disposal of waste in accordance with Federal, State, and local laws and regulations. The Government will review and sign the manifest prior to transportation and disposal of both hazardous and non-hazardous wastes. The principal components of the completed manifest package including the following:

- Waste Profile Sheets
- Waste Code
- Waste Disposal Characterization
- Waste Manifests
- Shipping Papers
- Land Disposal Restriction Notification and Certification Form.

The supporting information will contain the following information:

- Date of Initial Waste Generation
- Description of Process that Generated the Waste
- All Analytical Data and/or Process Knowledge used to characterize the Waste
- Date Samples were collected
- Description of Sampling Location/s and Sampling Methods and Equipment used
- Description of Sample Handling Techniques
- Correspondence Supporting Waste Classification Determination (as approved)
- Specific Type of Inner and Outer Packaging
- Markings, Labeling, and Placards Offered to the Transporter.

H&S will inspect the transport documentation prior to shipment of wastes to ensure that the packaging, marking, labeling, handling, and placarding of waste complies with Federal, State, and local laws and regulations. Additionally, H&S will inspect the transport vehicle prior to leaving the site. H&S will supervise all loading activities and monitor all stages of waste handling by the disposal contractor.

Hazardous waste is subject to additional waste management requirements including weekly inspections and is limited to a 90 day storage limitation from the accumulation start date. H&S will ensure waste is properly managed while awaiting disposal and will coordinate disposal activities to minimize the time waste remains onsite.

4.0 WASTE TRANSPORTATION AND DISPOSAL PROCEDURES

After the waste leaves NWIRP Bethpage, H&S will maintain a clear audit trail of the entire disposal operation including, but not limited to, the following:

- Waste Manifest Copies
- Bill of Ladings
- Route Map
- Driver Information and Truck Numbers
- Profile Sheet/s
- Certificate of Transfer
- Certificate of Disposal

4.1 Disposal Facility Information

The possible disposal facility designated for this project is:

- EQ Wayne Disposal, Inc. Site #2 Landfill
  49350 North I-94 Service Drive
  Belleville, MI 48111
  EPA ID #: MID048090633

APPENDIX D
Field Sampling SOPs

H&S Field SOP

SOIL SAMPLE SCREENING

1. Determine the location at which the sample is to be taken. If possible, identify an uncontaminated location at the same site from which soil of similar texture and moisture content can be obtained, to serve as a field "blank".

2. Fill a wide-mouthed glass jar about half-way with soil. To the extent practicable, soil should be mineral soil free of vegetation and stones larger than 1/2" in diameter.

3. Seal the samples immediately in the jars by placing a square of foil over the mouth and screwing on the lid.

4. Shake the jar for 30 seconds to thoroughly mix the contents.

5. If weather is cold, warm jar up in vehicle/trailer before measurement.

6. Allow at least 15 minutes but not more than 1 hour for volatiles to reach equilibrium with the headspace.

7. Warm up and calibrate the PID or FID instrument to be used to the calibration set point determined by the commissioner for the make/model of instrument in use and the product(s) present at the facility.

8. Measure the samples' headspace concentration. Break the foil seal with the instrument probe. Insert the instrument's probe about 1/2" into the jar. Record the highest reading that remains steady for 1-2 seconds (i.e., that is not due to instrument needle inertia). Repeat this step until all jars have been measured. Use caution not to draw water droplets or soil particulates into instrument. Note: Air replaces the sample withdrawn using the PID. This dilutes the headspace as it is being measured. It is important to obtain an instrument reading immediately after the seal is broken, preferably within 10 seconds. Once the jar has been used, it may not be used again, even if given time to reestablish equilibrium.

9. Record reading in log book. Also record approximate ambient temperature, time of collection and screening, and any pertinent observations (e.g., moisture of soil, etc.).

10. Note any correction factor for gas in log book and make calculation, showing both the corrected value and the direct instrument reading. For this project, the contaminant of concern with the lowest removal action goal, TCE, has a correction factor of 0.54 for a 10.6eV PID lamp.

11. At least 5% of soil screening samples should be duplicates in order to test reproducibility of results.

H&S Field SOP

SOIL SAMPLE COLLECTION

Soil samples may be collected using a variety of methods and equipment depending on the depth of the desired sample, the type of sample required (disturbed vs. undisturbed), and the soil type. Near-surface soils may be easily sampled using a spade, trowel, and scoop. Sampling at greater depths may be performed using a hand auger, continuous flight auger, a trier, a split-spoon, or, if required, a backhoe.

Collection of Surface Soil Samples

Collection of samples from near-surface soil can be accomplished with tools such as spades, shovels, trowels, and scoops. Surface material is removed to the required depth and a stainless steel or plastic scoop is then used to collect the sample. This method can be used in most soil types but is limited to sampling at or near the ground surface. Accurate, representative samples can be collected with this procedure depending on the care and precision demonstrated by the sample team member. A flat, pointed mason trowel to cut a block of the desired soil is helpful when undisturbed profiles are required. Tools plated with chrome or other materials should not be used. Plating is particularly common with garden implements such as potting trowels.

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.

2. Using a pre-cleaned, stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.

3. For samples not requiring volatile analysis, transfer the sample directly into an appropriate, labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval or location into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

4. Samples requiring volatile analysis will be collected using a TerraCore® sampler or equivalent so as not to lose volatiles during sample collection.

Sampling at Depth with Augers and Thin Wall Tube Samplers

This system consists of an auger, or a thin-wall tube sampler, a series of extensions, and a "T" handle. The auger is used to bore a hole to a desired sampling depth, and is then withdrawn. The

sample may be collected directly from the auger. The following procedure is used for collecting soil samples with the auger:

1. Attach the auger bit to a drill rod extension, and attach the "T" handle to the drill rod.

2. It may be advisable to remove the first three to six inches of surface soil for an area approximately six inches in radius around the drilling location.

3. Begin augering, periodically removing and depositing accumulated soils onto a plastic sheet spread near the hole. This prevents accidental brushing of loose material back down the borehole when removing the auger or adding drill rods. It also facilitates refilling the hole, and avoids possible contamination of the surrounding area.

4. After reaching the desired depth, slowly and carefully remove the auger from the hole. When sampling directly from the auger, collect the sample after the auger is removed from the hole and proceed to Step 10.

5. Remove auger tip from the extension rods and replace with a pre-cleaned thin wall tube sampler. Install the proper cutting tip.

6. Carefully lower the tube sampler down the borehole. Gradually force the tube sampler into the soil. Do not scrape the borehole sides. Avoid hammering the rods as the vibrations may cause the boring walls to collapse.

7. Remove the tube sampler, and unscrew the drill rods.

8. Remove the cutting tip and the core from the device.

9. Discard the top of the core (approximately 1 inch), as this possibly represents material collected before penetration of the layer of concern. Place the remaining core into the appropriate labeled sample container. Sample homogenization is not required at this point.

10. If volatile organic analysis is to be performed, insert the dedicated modified plastic 10-ml syringe into the core in order to obtain a cohesive sample, transfer the sample into an appropriate, labeled sample container using the syringe, and secure the cap tightly. Samples to be analyzed for total VOC compounds are collected from freshly exposed soil. Approximately 5 grams of sample is obtained using the syringe. A modified plastic syringe is used to gather the soil plugs or solid material sample. (The modified syringe has had the front end sliced off and uses a plunger without lubricant.) If the plastic syringe is used, then field personnel extrude these soil plugs into vials containing preservatives (sodium bisulfate solution or methanol) for total VOC analysis. Vials will be pre-weighed and pre-preserved in the laboratory. Samples in vials are re-weighed after the sample aliquots are added to obtain the net sample weights at the laboratory. All weights must be recorded to within 0.2 g. **Note: VOC samples can not be composited and homogenized in the field. If a composite sample is required, a separate VOC**

sample must be collected from each sub-sample location in a glass jar with minimal headspace and sent to the laboratory for compositing.

11. For additional analyses, place the remainder of the sample into a stainless steel or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

12. If another sample is to be collected in the same hole, but at a greater depth, reattach the auger bit to the drill and assembly, and follow steps 3 through 11, making sure to decontaminate the auger and tube sampler between samples.

13. Abandon the hole according to applicable state regulations. Generally, shallow holes can simply be backfilled with the removed soil material.

14. Decontaminate auger using the appropriate method.

Quality Assurance/Quality Control

There are no specific quality assurance (QA) activities which apply to the implementation of these procedures. However, the following QA procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

References

U.S. EPA Environmental Response Team, 2000. *Standard Operating Procedures. Soil Sampling (SOP 2012).* February.

En Novative Technologies, Inc.

Recommended Use Of The Terra Core®

NOTE: The Terra Core® Sampler is a single use device. It cannot be cleaned and/or reused.

Step 1

Have ready a 40ml glass VOA vial containing the appropriate preservative. With the plunger seated in the handle, push the Terra Core® into freshly exposed soil until the sample chamber is filled. A filled chamber will deliver approximately 5 or 10 grams of soil.

Step 2

Wipe all soil or debris from the outside of the Terra Core® sampler. The soil plug should be flush with the mouth of the sampler. Remove any excess soil that extends beyond the mouth of the sampler.

Step 3

Rotate the plunger that was seated in the handle top 90° until it is aligned with the slots in the body. Place the mouth of the sampler into the 40ml VOA vial containing the appropriate preservative and extrude the sample by pushing the plunger down. Quickly place the lid back on the 40ml VOA vial. **Note:** When capping the 40ml VOA vial, be sure to remove any soil or debris from the top and/or threads of the vial.

En Novative Technologies, Inc. • 1795 Industrial Drive • Green Bay, WI 54302 • www.ennovativetech.com
Phone: 920-465-3960 • Toll Free: 888-411-0757 • Fax: 920-465-3963

H&S FIELD SOP

FIELD DECONTAMINATION PROCEDURES

All decontamination procedures outlined herein are conducted by H&S personnel who have read and understand the decontamination process and who are accountable for ensuring that proper procedures and guidelines are followed.

All H&S personnel or other personnel who handle equipment in accordance with this procedure will wear, at a minimum, protective gloves and eyewear during the decontamination process.

All non-disposable sampling and field equipment is to be decontaminated prior to sample collection and/or at the end of each sampling or field event.

At the end of each sampling or field event, decontaminated equipment is to be stored in a clean protective casing or carefully wrapped in aluminum foil. Any portion of the equipment that comes into contact with water or soil is cleaned, or disposed of and replaced, prior to re-use.

All non-disposable field equipment will be decontaminated as described below before each use to avoid cross-contamination between samples and to ensure the health and safety of the field crews. The following decontamination procedures are to be followed for all non-disposable soil and groundwater sampling equipment:

1. Remove gross contamination from all equipment and sampling devices with a tap water rinse and a soft-bristled brush.
2. Flush necessary sampling devices (pumps and tubing) with two gallons of distilled water.
3. Flush necessary sampling devices (pumps and tubing) with deionized (DI) water.
4. Wash equipment with Liquinox detergent or equivalent and water
5. Rinse equipment thoroughly with distilled water
6. Rinse equipment with reagent-grade methanol
7. Give equipment a final rinse with distilled water
8. Place the sampling equipment on a clean surface and air dry.