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FINAL ENHANCED IN SITU BIOFILTER PILOT STUDY WORK PLAN FOR SITE 4 NORTH  
AVGAS TANK SLUDGE DISPOSAL AREA NAS WHITING FIELD FL  
2/1/2016  
AGVIQ/CH2M HILL

# Final Enhanced In Situ Biofilter Pilot Study Work Plan

Site 4 - North AVGAS Tank Sludge Disposal Area

Naval Air Station Whiting Field  
Milton, Florida

Revision No. 00

Contract No. N624670-08-D-1006

Task Order No. JM19

Submitted to:



U.S. Naval Facilities  
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February 2016

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# Contents

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<b>Acronyms and Abbreviations .....</b>	<b>v</b>
<b>1.0 Introduction.....</b>	<b>1-1</b>
1.1 Purpose of Plan.....	1-1
1.2 Description of Biofilter Pilot Study Technology .....	1-1
1.2.1 Biofilter Design Background .....	1-2
1.3 Project Objective .....	1-2
1.4 Health and Safety .....	1-3
1.5 Pilot Study Documentation.....	1-3
1.6 Work Plan Organization.....	1-4
<b>2.0 Site Description and History.....</b>	<b>2-1</b>
2.1 Site Description.....	2-1
2.2 Site Background.....	2-1
2.3 Historical Site Investigations .....	2-7
2.4 Nature and Extent of Soil Contaminants .....	2-10
2.5 Site Geology and Hydrogeology .....	2-11
2.6 Utilities and Surface Features .....	2-12
<b>3.0 Project Execution Plan.....</b>	<b>3-1</b>
3.1 Mobilization, Site Preparation, and Utility Clearance .....	3-1
3.2 Enhanced In Situ Biofilter Pilot Study .....	3-1
3.2.1 Pilot Study Area Layout.....	3-1
3.2.2 In Situ Biofilter Test Objective.....	3-5
3.2.3 In Situ Biofilter Trench Sizing .....	3-5
3.2.4 In Situ Biofilter Materials and Construction .....	3-6
3.2.5 Base Support Requirements .....	3-12
3.3 In Situ Biofilter Test Procedures .....	3-15
3.3.1 Background Flux Sampling .....	3-15
3.3.2 System Startup.....	3-15
3.3.3 First Month Monitoring and Maintenance.....	3-16
3.3.4 90-Day Biofilter Assessment.....	3-17
3.4 Site Cleanup and Restoration .....	3-17
3.5 Decontamination and Demobilization .....	3-17
3.6 Project Schedule.....	3-18
3.7 Project Organization and Communications .....	3-18
3.8 Traffic Control Plan.....	3-22
<b>4.0 Sampling and Analysis Plan.....</b>	<b>4-1</b>
4.1 Data Quality Levels for Measurement Data .....	4-1
4.2 Sampling Objectives.....	4-1
4.3 Soil Gas Sampling.....	4-3
4.3.1 SVE Effluent / Biofilter Influent Sampling .....	4-4
4.3.2 Biofilter Effluent Flux Sampling .....	4-4
4.4 Waste Characterization and Disposal Sampling.....	4-5
4.5 Equipment Decontamination.....	4-5

4.6	Sample Documentation .....	4-7
4.7	Sample Nomenclature .....	4-8
4.8	Cross-Contamination Minimization.....	4-9
4.9	Field Quality Control.....	4-9
	4.9.1 Equipment Blanks.....	4-9
	4.9.2 Field Duplicates.....	4-10
	4.9.3 Sampling Containers, Analytical Methods, Preservatives, and Holding Times.....	4-10
4.10	Analytical Methods .....	4-10
<b>5.0</b>	<b>References .....</b>	<b>5-1</b>

## Appendixes

A	Accident Prevention Plan
B	Waste Management Plan
C	Environmental Protection Plan
D	Quality Control Plan
E	Maintenance and Monitoring Logs

## Tables

3-1	Biofilter Trench Media Composition .....	3-5
3-2	Soil Gas Sampling Locations.....	3-15
3-3	Pilot Study Schedule .....	3-18
3-4	Roles, Responsibilities, and Authorities of Key Project Personnel.....	3-18
3-5	Communications Matrix.....	3-22
3-6	Project Personnel Directory.....	3-22
4-1	Data Quality Levels.....	4-1
4-2	Sampling and Analysis Summary.....	4-2
4-3	Sampling Details.....	4-3
4-4	Sampling Plan.....	4-4

## Figures

2-1	Site Topographic Map.....	2-3
2-2	Potential Source Areas .....	2-5
2-3	Lateral Extent of Upper Perched Zone.....	2-13
2-4	Section A-A' Soil Boring Observations.....	2-15
3-1	Biofilter Test Layout (with sampling locations).....	3-3
3-2A	Cross-section (End) of Biofilter Trench Configuration .....	3-7
3-2B	Cross-section (Side) of Biofilter Trench Configuration.....	3-9
3-3	Equipment and Instrumentation Setup.....	3-13
3-4	Project Organization Chart .....	3-21

# Acronyms and Abbreviations

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°F	degrees Fahrenheit
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFCEE	Air Force Center for Environmental Excellence
AGVIQ-CH2M HILL	AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III
AST	aboveground storage tank
AVGAS	aviation gasoline
Bechtel	Bechtel Technology & Consulting
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CH2M HILL	CH2M HILL Constructors, Inc.
CO <sub>2</sub>	carbon dioxide
CVOC	chlorinated volatile organic compound
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FC	flux chamber
FDEP	Florida Department of Environmental Protection
FEAD	Facility Engineering and Acquisition Division
FID	flame ionization detector
ft/ft	feet per foot
HAP	hazardous air pollutant
HDPE	high-density polyethylene
LEL	lower explosive limit
LNAPL	light non-aqueous phase liquid
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m <sup>3</sup>	milligrams per cubic meter
mL	milliliters
MOGAS	motor gasoline
MP	monitoring port
MS/MSD	matrix spike/matrix spike duplicate
NA	not applicable
NAD83	North American Datum of 1983
NAS	Naval Air Station
NAVD	North American Vertical Datum
NAVFAC SE	Naval Facilities Engineering Command Southeast
NTR	Navy Technical Representative
O&M	operation and maintenance
O <sub>2</sub>	oxygen
PAH	polycyclic aromatic hydrocarbon
ppm	parts per million

ppmv	parts per million by volume
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RAP	Remedial Action Plan
ROI	radius of influence
RPM	Remedial Project Manager
SAR	Site Assessment Report
scfm	standard cubic feet per minute
SCTL	soil cleanup target level
SOP	Standard Operating Procedure
SRS	Solar Remediation System
SVE	soil vapor extraction
SVOC	semivolatile organic compound
T&D	transportation and disposal
TAT	turnaround time
TO	Task Order
TOC	total organic carbon
TRPH	total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
TVH	total volatile hydrocarbons
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
yd <sup>3</sup>	cubic yards

# 1.0 Introduction

---

AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III (AGVIQ-CH2M HILL) was contracted by U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE) to perform activities for an enhanced in situ biofilter pilot study at Site 4 (Operational Unit 4), the North Aviation Gasoline (AVGAS) Tank Sludge Disposal Area, Naval Air Station (NAS) Whiting Field, Milton, Florida. Upon completion of a previous pilot study at the site (bioventing effort), additional pilot testing that will utilize an enhanced in situ biofilter was requested by the Navy. Work has been and will be completed under Contract No. N624670-08-D-1006, Task Order (TO) No. JM19. The purpose of this Work Plan is to outline the activities for the enhanced in situ biofilter pilot study implementation at Site 4.

## 1.1 Purpose of Plan

This document presents equipment specifications and field procedures for performing the enhanced in situ biofilter pilot study at Site 4, NAS Whiting Field. AGVIQ-CH2M HILL conducted a bioventing pilot study at the site from December 2014 through January 2015 to determine the feasibility of using air injection to increase oxygen (O<sub>2</sub>) supplies in the subsurface and to promote aerobic biodegradation of fuel contaminants. The bioventing pilot study showed that the rates of biodegradation at Site 4 were at least an order of magnitude lower than the national average rates measured at successful bioventing sites. This indicates that the aerobic bacterial population capable of achieving hydrocarbon degradation in soil at Site 4 is not well established and may be limited by low natural nutrient levels in sandy soils. As a result, bioventing at Site 4 could require an extended period of operation to stimulate the growth of microbes responsible for hydrocarbon degradation in an effort to achieve soil cleanup goals.

As an alternative approach to bioventing, AGVIQ-CH2M HILL proposed a combination of low-flow rate soil vapor extraction (SVE) and treatment of vapors in an engineered in situ biofilter. This alternative was discussed with the Navy during a conference call on February 9, 2015. The engineered biofilter will provide an optimized environment for soil bacteria and significantly increase biodegradation rates for hydrocarbon vapors.

## 1.2 Description of Biofilter Pilot Study Technology

A typical biofilter consists of an aboveground vessel filled with optimized compost and wood chip treatment media to greatly increase the rate of biodegradation of volatile hydrocarbons. This pilot test will use in situ trenches filled with similar compost/wood media to treat fuel vapors. Perforated vapor distribution pipes will be placed at the bottom of the biofilter trenches, and vapors from the SVE system will pass through these pipes into the trenches filled with organic-rich media to facilitate biodegradation and reduce the discharge of volatile hydrocarbons to the atmosphere. A soaker hose at the top of the trench media will maintain an optimal moisture content for the hydrocarbon degrading bacteria. The media will be covered with impermeable liners and topsoil to avoid short-circuiting of vapors to the surface.

## 1.2.1 Biofilter Design Background

In situ biofilters have been tested at multiple gasoline sites where SVE was the safest method of removing hydrocarbon vapors from beneath active commercial gasoline stations. Vapors have been treated in both aboveground biofilters and in situ biofilters. At two of these sites, extracted soil gas was conveyed to trenches filled with organic rich topsoil. Perforated vapor distribution pipes were placed at the bottom of these biofilter trenches, and vapors from the associated SVE systems were biodegraded in the biofilters while the discharge of volatile hydrocarbons to the atmosphere was controlled.

In 1992, a pilot test consisting of a 25-standard cubic feet per minute (scfm) SVE system with off-gas treatment in a native topsoil biofilter was completed at Eglin Air Force Base (AFB), Florida (Downey et al., 1993). The biofilter loading rate was 11 pounds of fuel per day. Fuel vapor was not detected at the ground surface using a handheld vapor detector. Removal effectiveness was not determined, as more sophisticated flux monitoring was not conducted in this early test. In 1993, a full-scale biofilter was used to treat off-gas from an SVE system installed at a gasoline station spill at Vandenberg AFB, California. The SVE system extracted 49 scfm, and the off-gas was conveyed to two 6-foot-deep biofilter trenches containing a total of 230 cubic yards (yd<sup>3</sup>) of topsoil. Surface flux chamber (FCs) were used to determine the amount of hydrocarbons emitted to the atmosphere. The biofilter achieved a 99 percent removal of total volatile hydrocarbons (TVH) at a loading rate of 14 pounds of TVH per day. This equates to a loading rate of 0.061 pound TVH per yd<sup>3</sup> per day (Downey et al., 1994).

Commercially available aboveground biofilters containing compost and bark mulch media are available to treat industrial vapors, including fuel and benzene, toluene, ethylbenzene, and xylenes (BTEX). Loading rates of 26 to 50 grams TVH per cubic meter per hour have achieved 82 to 98 percent removal rates (Namkoong et al., 2003). This equates to loading rates of 1 to 2 pounds TVH per cubic yard media per day. Aboveground biofilters use a mix of compost and bark or wood chips, and controlled moisture to create very large microbiological populations for fuel biodegradation. The U.S. Environmental Protection Agency (EPA) reported that compost-based biofilters can achieve 90 percent BTEX removal efficiencies (EPA, 2006). The reported TVH loading rates for engineered biofilters are nearly 100 times higher than previous experience with soil-only biofilter trenches.

## 1.3 Project Objective

The objective of this pilot study is to evaluate and optimize the in situ biofilter trench media that can provide the most effective biodegradation rates for volatile hydrocarbons present in extracted soil vapor. Test data will be used to design a full-scale system for Site 4.

To accomplish this objective, the following activities are planned:

- Three trenches (50 feet long, 6 feet deep, and 3 feet wide each) with capacity to contain about 33 yd<sup>3</sup> of media will be excavated and backfilled with a variable mix of compost, topsoil, crushed rock, and wood chips. The material in one trench also will be amended with nitrogen/phosphorous nutrients to determine if additional nutrients will stimulate biological growth and increased biodegradation.

- Each trench will have a vapor distribution pipe at the bottom and a soaker hose at the top, and will be covered with a high-density polyethylene (HDPE) liner and topsoil. A piezometer will be installed to track water levels in each trench and to regulate soaker hose water addition to prevent flooding of the biofilter trenches.
- Vapor monitoring ports (MPs) and surface FCs will be used to estimate the influent and effluent concentrations of TVH (carbon range C3-C14) and volatile organic compounds (VOCs) plus chlorinated volatile organic compounds (CVOCs) associated with the in situ biofilter.
- Background soil gas flux measurements will be collected from soil gas FCs and MPs after biofilter construction and 2 weeks prior to system startup to determine the additional VOCs + CVOCs and TVH surface flux emissions that can be attributed to the biofilter operation.
- After system startup, biofilter performance assessment will be performed at 30 days, 50 days, 70 days, and 90 days. The first month of biofilter operation will be used to establish operating flow rates, temperatures, and pressures. This period also will be used to acclimate the biofilter media to the fuel vapor stream and promote growth of the indigenous bacteria that are capable of degrading fuel hydrocarbons.
- The results of the 30-, 50-, 70-, and 90-day biofilter effluent and flux sampling effort will be used to determine which biofilter media appear to be providing the best treatment of VOCs + CVOCs and TVH.
- Based on the 90-day assessment, a recommendation will be made to the Navy to either continue the biofilter operations without modification or focus testing on the impact of changing specific operating conditions (i.e., flow, moisture content, or nutrient addition).

The results of the enhanced in situ biofilter pilot study will provide the Navy with information to finalize the remedial design for Site 4.

## 1.4 Health and Safety

AGVIQ-CH2M HILL will comply with the health and safety requirements outlined in the project Accident Prevention Plan (Appendix A). Air monitoring instruments including an O<sub>2</sub>/lower explosive limit (LEL) meter, Draeger tubes, and a flame ionization detector (FID) will be used during onsite activities as needed. All workers involved in any intrusive work or those who may be exposed to subsurface soils, groundwater, or waste-impacted materials will provide evidence of medical certification, respirator fit test, and 40-hour or 8-hour refresher Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response training to AGVIQ-CH2M HILL prior to the start of work. No onsite work will be allowed until all information is provided to AGVIQ-CH2M HILL.

## 1.5 Pilot Study Documentation

The pilot study construction will be summarized in a brief Construction Completion Report. The operational data, analytical data, and an evaluation of the data for the pilot study will be summarized and reported in a brief report for NAVFAC SE review at the end of the planned 90-day operational period. If the pilot study operation is extended, quarterly

operational reports will be provided that summarize the data collected during each quarter and include an analysis of the data. The brief report(s) will include tables and graphics to demonstrate the performance of the enhanced in situ biofilter, calculated SVE removal rates, calculated biofilter vapor emissions rates, and removal efficiencies of the various biofilter media types. From these data, a conceptual full-scale biofilter system design will be prepared.

## 1.6 Work Plan Organization

In addition to outlining the requirements for the enhanced in situ biofilter pilot study, this Work Plan describes the procedures that will be used to conduct the sampling associated with the pilot study in general accordance with the guidance and requirements of Florida Department of Environmental Protection (FDEP) Chapter 62-780, Florida Administrative Code (FAC) "Contaminated Site Cleanup Criteria" (FDEP, 2012). The project action levels for this work are the FDEP Cleanup Target Levels for soil and groundwater presented in Chapter 62-777, FAC (FDEP, 2005).

This Work Plan is organized into the following sections of text and appendixes:

- Section 1.0 Introduction
- Section 2.0 Site Description and History
- Section 3.0 Project Execution Plan
- Section 4.0 Sampling and Analysis Plan
- Section 5.0 References
- Appendix A Accident Prevention Plan
- Appendix B Waste Management Plan
- Appendix C Environmental Protection Plan
- Appendix D Quality Control Plan
- Appendix E Maintenance and Monitoring Logs

## 2.0 Site Description and History

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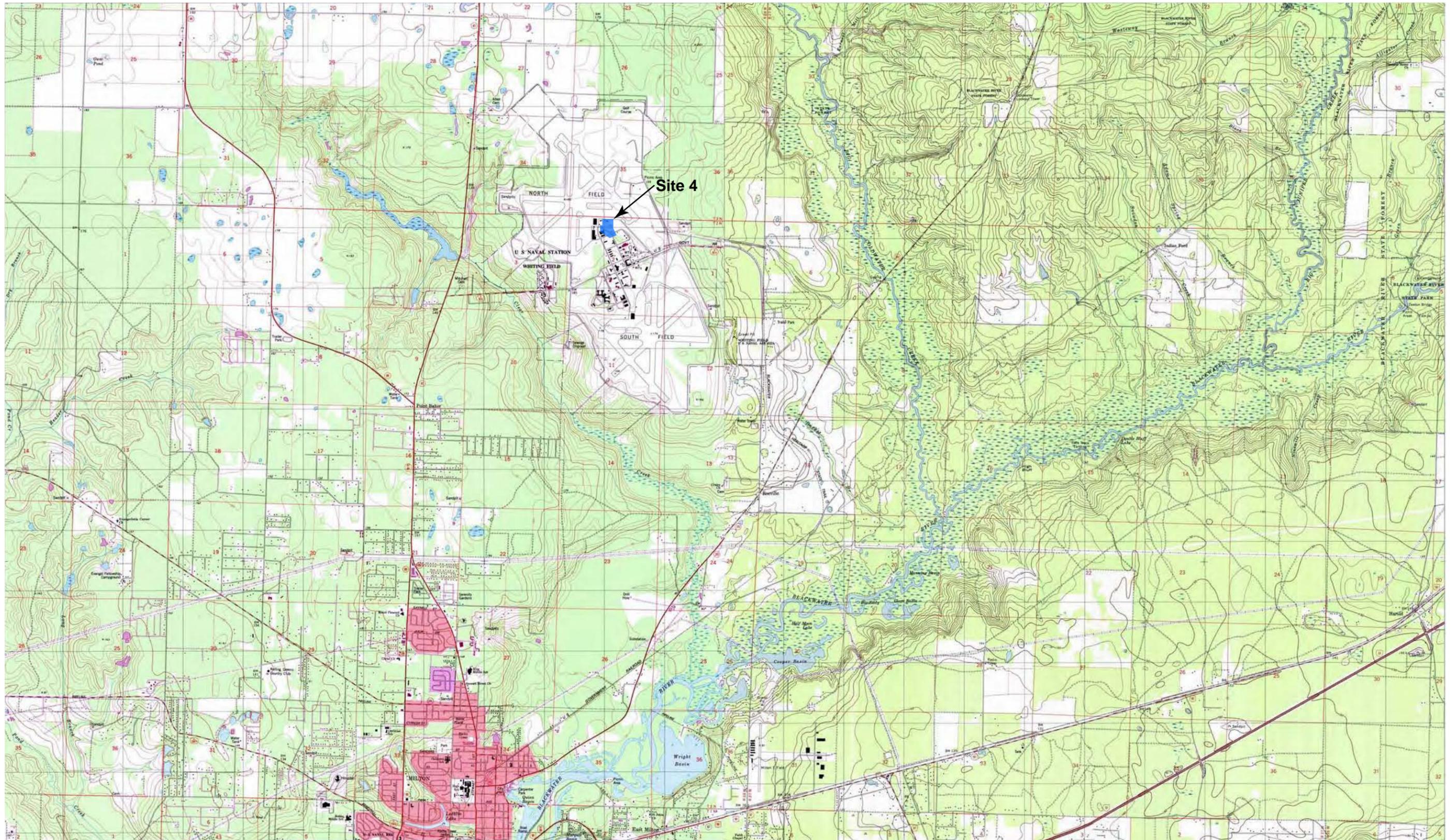
### 2.1 Site Description

NAS Whiting Field is located in Santa Rosa County, in Florida's northwest coastal area, and is approximately 5.5 miles north of Milton and 25 miles northeast of Pensacola. The station has served as a naval aviation training facility since it was established as a naval air auxiliary station in July 1943. Site 4 lies within the northeast portion of the northwest quarter of Section 2, Township 2 North, Range 28 West, as shown on the Milton North, Florida, U.S. Geologic Survey (USGS) Topographic Quadrangle Map (USGS, 1987), presented as Figure 2-1. Site 4 includes the intersection of USS Saratoga Street and USS Hornet Street, and extends approximately 140 feet north of USS Enterprise Street. The area includes approximately 190,000 square feet or 3.4 acres of land that is grass covered, except for the asphalt covering on the roads.

Big Coldwater Creek is about 2 miles east of Site 4 and Clear Creek is a mile to the west (see Figure 2-1). These two streams are tributaries of the Blackwater River, which discharges to the estuarine waters of the East Bay of the Escambia Bay coastal system. Both Clear Creek and Big Coldwater Creek are classified by FDEP as Class III, surface waters designated for Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife. Blackwater River is also classified as an Outstanding Florida Water. Outstanding Waters are considered to be of exceptional recreational and ecological significance. The shallow aquifer at NAS Whiting Field is approximately 100 feet below land surface (bls), with localized perched zones occurring at higher elevations (Tetra Tech NUS, Inc. [TtNUS], 2007).

### 2.2 Site Background

Site 4 includes the former underground storage tank (UST) facility (designated as UST Site 1467), which contained eight 25,000-gallon steel USTs and one 15,000-gallon steel UST. AVGAS was piped from the Site 4 UST system to the dispensing or delivery locations (hydrant area). According to historical documents, the nine USTs were installed in 1943. The eight 25,000-gallon steel tanks initially contained AVGAS and the 15,000-gallon steel tank initially contained gasoline. Sometime between 1968 and 1973, the contents of the 25,000-gallon tanks were switched from AVGAS to diesel fuel or to unleaded gasoline. From 1973 to 1984, six of the 25,000-gallon tanks were filled with water. Three tanks (1467-F, -G, and -H) remained in use for storage of gasoline, diesel fuel, and contaminated jet fuel, respectively. Eight USTs were excavated and removed in 1992, and a Discharge Reporting Form was submitted to FDEP for each of the USTs removed (Sub-Tech, Inc., 1992). Two aboveground storage tanks (ASTs) were installed in 1993 for storage of motor gasoline (MOGAS) and diesel fuel. The AST dispensing island is located parallel to and southeast of the MOGAS tanks. Figure 2-2 presents the site, the fuel storage tanks (USTs and ASTs), and the pipelines.



Quadrangle Map (USGS, 1987) Harold, Milton North

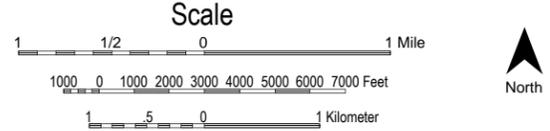
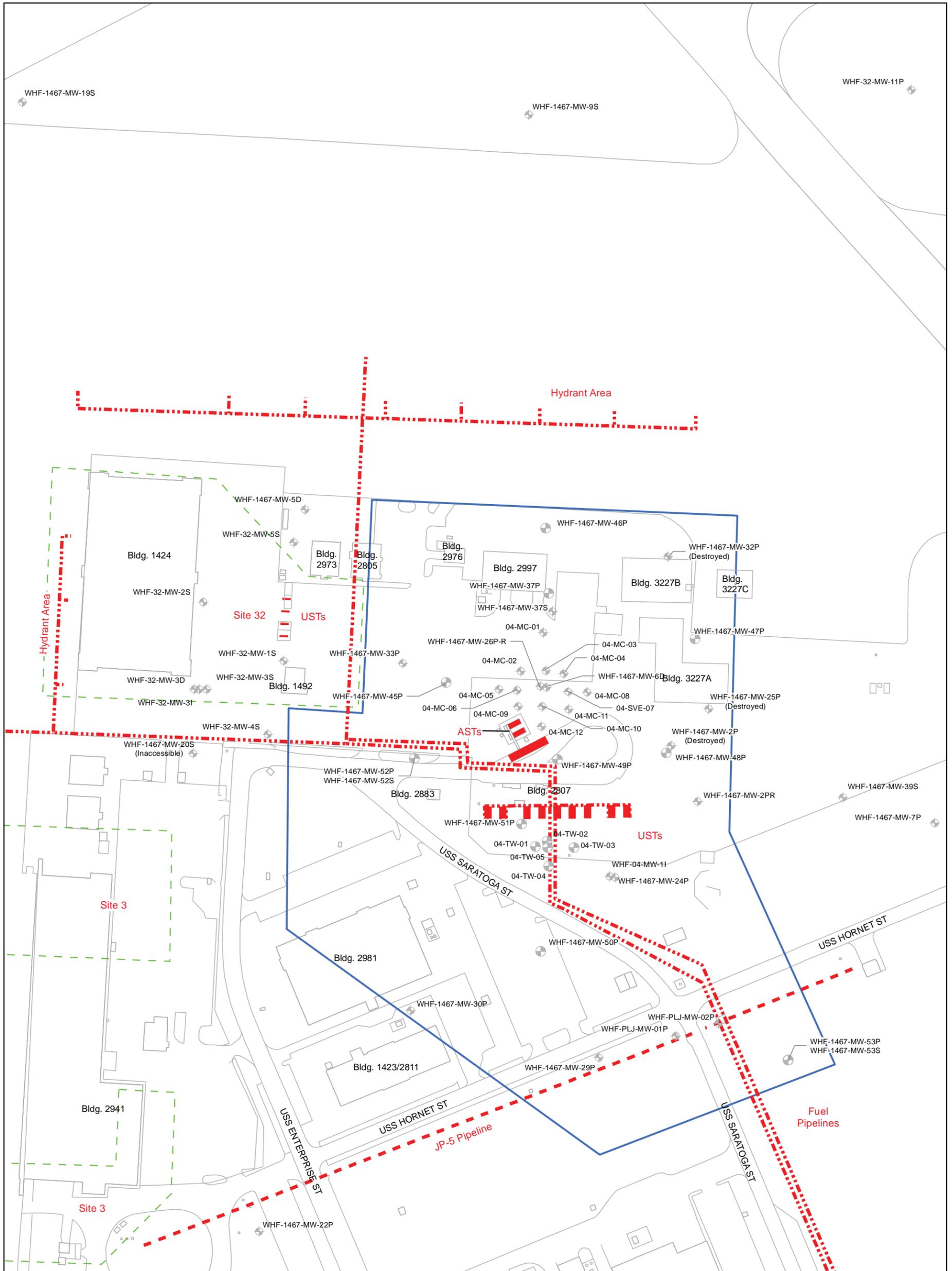


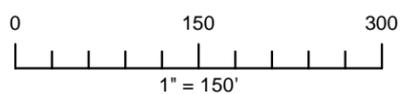
FIGURE 2-1  
Site Topographic Map  
Site 4, NAS Whiting Field





**Legend**

- ⊕ 2011 Monitor Well
- ⊕ Existing Monitor Well
- ⊕ 2011 Multi Completion Well
- ⊕ Treatment Well
- JP-5 Pipeline
- - - Fuel Pipeline Location
- ▭ Site 4 Boundary
- - - IR Sites



**FIGURE 2-2**  
Potential Source Areas  
Site 4, NAS Whiting Field



The JP-5 underground product line generally lies at a depth of approximately 3 feet bls, except for an aboveground junction with the AVGAS pipeline and an exposed portion near the pump station facility. The 10-inch metal product line was affiliated with two 231,000-gallon ASTs containing JP-5. The pipeline was taken out of service through in-place closure in 1996 (Jim Stidham & Associates Inc., 1996).

The 6-inch AVGAS pipeline used to transfer fuel from the north fuel storage area to the south fuel storage area was closed in place between August 29, 2000 and September 1, 2000 (TtNUS, 2001). Attempts to clean the pipeline with soft foam pigs prior to closure were not successful because the pipelines were filled with water. To close the AVGAS pipeline, 1,700 gallons of water were removed for offsite disposal. Pipeline ends were capped using a soft foam plug inserted 1.5 feet into the pipeline and grouted with 40 pounds of QUIKRETE®.

## 2.3 Historical Site Investigations

An Initial Assessment Study was conducted at NAS Whiting Field in 1985. UST Site 1467 (Site 4) was recommended for additional investigation based on the potential for tetraethyl lead contamination from the tank bottom sludge disposal at the site (Envirodyne Engineers, Inc., 1985).

In 1986, a Verification Study of Potential Groundwater Pollution was conducted at NAS Whiting Field. The assessment included collecting and analyzing soil samples, as well as installing and sampling one groundwater monitoring well at UST Site 1467 (Site 4). Total lead was detected in the soil samples at concentrations of 15 and 27 milligrams per kilogram (mg/kg). The Extraction Procedure Toxicity lead concentrations were less than 0.01 milligrams per liter (mg/L). All lead concentrations were below regulatory standards. Benzene was detected in groundwater at concentrations exceeding the Florida drinking water standard. Toluene and lead were also detected in groundwater, but the concentrations were significantly below regulatory standards (Geraghty & Miller, Inc., 1986).

A UST closure was performed at the site in 1992. This included the removal of the 25,000-gallon USTs; however, the associated concrete tank saddles were left in place. During the closure, the presence of petroleum-contaminated soils in the tank pits was noted. A Discharge Reporting Form was submitted to FDEP for each of the USTs removed (Sub-Tech, Inc., 1992).

From 1991 through 1992, a Jurisdiction Assessment was conducted at UST Site 1467 (Site 4) under the UST Program. The groundwater investigation identified a commingled groundwater plume of petroleum hydrocarbons and chlorinated compounds. Based on the commingled groundwater plume, UST Site 1467 was moved from the UST Program to the Installation Restoration Program and designated as Site 4 (ABB Environmental Services, Inc., 1994).

A Remedial Investigation at Site 4 was conducted in phases from 1986 through 1999. Field work included a range of environmental studies to collect data needed to determine the presence, nature, and extent of contamination; and included installing 11 soil borings, collecting surface and subsurface soil samples, and performing a Human Health and Ecological Risk Assessment. Contaminants detected in the surface and subsurface soil

included VOCs, semivolatile organic compounds (SVOCs), total recoverable petroleum hydrocarbons (TRPH), pesticides, and inorganic compounds (TtNUS, 1999). Groundwater is being evaluated separately as part of the basewide groundwater study (Site 40).

In April 1998 during groundwater sampling activities, TtNUS discovered 1.6 feet of free-phase petroleum hydrocarbon product floating on top of the water table in monitoring well WHF-1467-MW-26P. The well was located approximately 150 feet north of the former AVGAS tanks at Site 4. Approximately 1.6 gallons of light non-aqueous phase liquid (LNAPL) were removed by bailing the well (TtNUS, 1998). A sample of the product was collected for fingerprinting and was determined to be 90 percent AVGAS. Monitoring well WHF-1467-MW-26P was screened into a perched water zone lying above a clay layer and has since been destroyed inadvertently and is no longer present at the site.

Installation of an in situ soil venting system to treat organics in subsurface soil was one of four alternatives evaluated in the 2001 Feasibility Study for Site 4 (TtNUS, 2001). Bechtel Technology & Consulting (Bechtel) developed a solar-powered technology that incorporates an advanced design powered by a photovoltaic system using solar energy to drive a high-efficiency blower for bioventing or limited SVE. To determine the effectiveness of Bechtel's Solar Remediation System (SRS) in decreasing the concentrations of VOCs and SVOCs in the subsurface soil at Site 4, a pilot study was designed and implemented. The focus of the pilot study was to evaluate the effectiveness of the SRS units in treating the vertical and horizontal extent of soil contamination at Site 4.

CH2M HILL Constructors, Inc. (CH2M HILL) conducted the pilot study from 2001 through 2003. In July 2001, five SRS units were installed at Site 4. Evaluations were made based on a series of performance monitoring tests operating the SRS units in a pull configuration (SVE), push configuration (bioventing), and push/pull configuration. Weekly air monitoring and O&M were conducted. The shallow (18 feet bls), intermediate (43 feet bls), and deep (72 feet bls) zones were treated independently. Analytical parameters for the soil samples included BTEX, polycyclic aromatic hydrocarbons (PAHs), TRPH, and total organic carbon (TOC).

The overall performance of the SRS units was tempered by lower flow rates than expected and the impact of barometric pressure. Barometric pressure had a significant impact during the previous pilot study; often, the SRS blower could not overcome the barometric pressure. The SRS units were designed to produce flow rates between 20 and 30 cubic feet per minute (cfm) per unit. However, the flow rates were performing at 18 to 27 percent of design with an average flow of 5.4 cfm during startup to 3.3 cfm during the shallow zone testing. This decreased flow rate also was observed during the intermediate zone (average flow of 3 cfm) and deep zone (average flow of 1.7 cfm, or 5.5 to 8.5 percent of the design) testing (CH2M HILL, 2004a). This resulted in a radius of influence (ROI) that was smaller than that typically observed for bioventing and SVE systems (anticipated to be a minimum of 50 feet).

The ROI is defined as the greatest distance from an extraction/treatment well at which a sufficient vacuum and vapor flow can be induced to adequately capture and extract contaminants in the vapor zone. As a rule-of-thumb, the ROI is often considered to be the distance from the extraction/treatment well at which a vacuum of at least 0.1 inch of water is observed.

In 2008, CH2M HILL implemented additional investigations of the former AVGAS tanks to confirm the presence or absence of LNAPL, and evaluate the ROI of a conventional SVE system in the location of the previous SRS pilot study. Activities included installation of additional soil borings and monitoring wells, soil and groundwater sampling, repairing existing SVE system wells, conducting an SVE pilot test, and collecting soil gas samples.

During the 2008 assessment, additional areas impacted with LNAPL were identified and delineation of the LNAPL plume was found not to be complete. LNAPL was encountered in soil between 30 and 70 feet bls consistently in all directions within a 50-foot radius of monitoring well WHF-1467-MW-26P-R. Measureable product was observed in completed wells WHF-04-MC-02, -03, -04, -05, -06, -09, -10, -11, and -12. Product was determined to be delineated only in the eastern direction. In addition, LNAPL was discovered in soil between 70 and 80 feet bls in 8 of 13 borings advanced during the investigation. Soil sampled from only two borings installed in the western portion of the site contained LNAPL at depths less than 30 feet bls. Soil and groundwater contamination was not considered fully delineated. Pilot testing in the intermediate and deep zones was successful, but testing in the shallow zone was not effective.

A Site Assessment was conducted by CH2M HILL in 2011 to determine the presence/absence of source material, extent of contamination, and potential for migration of contaminants in the soil and groundwater. The effort was also conducted to perform a preliminary evaluation of the current and potential future risk to human health and the environment. A Site Assessment Report (SAR) was prepared to fill data gaps for vadose zone remedial system design (CH2M HILL, 2013).

The primary objective of the SAR was to fill data gaps to facilitate the selection of the most cost-effective remediation strategy for Site 4 that is protective of human health and the environment. The specific objectives of the additional 2011 Site Assessment activities were to:

- Further delineate the horizontal and vertical distribution of soil contamination exceeding the FDEP Soil Cleanup Target Levels (SCTLs).
- Further delineate the horizontal extent and distribution of LNAPL in both soil and perched water at the site.
- Define the physical/chemical characteristics and mobility of LNAPL in site soil as they relate to conventional LNAPL recovery.
- Estimate the probable range of total contaminant mass and distribution in site soil.
- Characterize perched water zones and relevant geologic and hydrogeologic characteristics that influence migration and transport of petroleum products.
- Identify potential risks posed by vadose zone contamination through a screening level risk evaluation.

The SAR recommended a Remedial Action Plan (RAP) be prepared to identify remedial alternatives for Site 4.

Prior to the preparation of a RAP, AGVIQ-CH2M HILL completed a bioventing pilot study at Site 4 from December 2014 through January 2015 to determine the feasibility of using air injection to increase O<sub>2</sub> supplies in the subsurface and to promote aerobic biodegradation of fuel contaminants. After an initial measurement of baseline O<sub>2</sub>, carbon dioxide (CO<sub>2</sub>), and hydrocarbon vapor levels in 27 soil gas vapor monitoring points, air was injected into a central vent well (04-MC-10) at a rate of 40 scfm. During the 6-day air injection period, changes in soil gas pressure, O<sub>2</sub>, CO<sub>2</sub>, and hydrocarbon vapor levels were measured and recorded for each monitoring point. Based on the air injection testing, it was concluded that the sandy soils at Site 4 were highly permeable to air flow and that a radius of pressure and O<sub>2</sub> influence extended at least 140 feet from the central air injection well. Hydrocarbon vapor level changes also were measured 140 feet from the air injection well.

After 6 days of air injection, the blower was turned off and an in situ respiration test was started. In situ respiration testing measures the rate at which soil microbes use O<sub>2</sub> in the process of biodegrading fuel hydrocarbons. As documented by the Air Force Civil Engineer Center (AFCEC), formerly the Air Force Center for Environmental Excellence (AFCEE), measuring the rate at which O<sub>2</sub> levels decrease can help estimate a site-specific fuel biodegradation rate (Parsons, 2004). Increases in CO<sub>2</sub> also indicate that biodegradation is occurring. At Site 4, O<sub>2</sub> and CO<sub>2</sub> levels were measured in 16 of the monitoring points where initially depleted O<sub>2</sub> levels indicated bioactivity was present. Based on 39 days of respiration testing, 14 of the 16 monitoring points exhibited O<sub>2</sub> utilization rates of less than 0.7 percent O<sub>2</sub> per day. This equates to an estimated fuel biodegradation rate of less than 130 milligrams of fuel per kilogram of soil per year. In contrast, the average biodegradation rate measured in 145 Air Force bioventing pilot tests nationwide was 1,200 milligrams of fuel per kilogram of soil per year (AFCEE, 1996). One monitoring point (04-SVE-01) at Site 4 had a much higher rate of O<sub>2</sub> utilization and an estimated biodegradation rate of 646 milligrams of fuel per kilogram of soil per year. This result appears to be an anomaly but may represent a small area of the site where biodegradation is more active. The low rates of in situ biodegradation measured in Site 4 soils may be the result of a smaller bacteria population in these sandy soils.

## 2.4 Nature and Extent of Soil Contaminants

Field screening and analytical results indicate that the primary contaminants of potential concern at Site 4 are petroleum hydrocarbon constituents. The presence of both free product floating on perched groundwater and excessively contaminated subsurface soil have been documented at multiple depths in the vadose zone. Dissolved hydrocarbon compounds have been detected in both perched groundwater and in the Sand-and-Gravel aquifer that underlies Site 4. Hydrocarbon contamination is not likely to be present in surface soil (0 to 1 foot bls) at Site 4 because VOCs tend to evaporate into the atmosphere rather than persist in surface soils, and because contaminant releases were primarily in the subsurface in the form of releases from buried pipelines or USTs.

According to the SAR (CH2M HILL, 2013), three onsite hydrocarbon release locations were identified during the Site Assessment: the AST area, the UST area, and the AVGAS/JP-5 Pipeline Junction. The locations are further described as follows:

- The source of the release in the AST area is unknown and predates AST construction. The AST area release overlies the upper perched aquifer.
- The USTs contained AVGAS, gasoline, unleaded gasoline, diesel fuel, and contaminated jet fuel. USTs were located above the lower perched groundwater zone and were excavated and removed in 1992. The AVGAS pipeline was closed in place in 2000.
- The JP-5 pipeline is located in the southern section of the site, and also overlies the lower perched groundwater zone. The pipeline was closed in place in 1996.

Free floating product has been measured in the majority of upper perched groundwater wells, at one time or another, since installation of multi-completion wells in May/June 2008. Free product thickness has ranged from a sheen to over 2 feet. Hydrocarbon fingerprinting conducted during the mobility assessment documented in the SAR (CH2M HILL, 2013) indicates a mixture of regular gasoline (MOGAS) and AVGAS. Free floating product has never been detected in lower perched or Sand-and-Gravel aquifer wells installed at Site 4.

Hydrocarbon constituents dissolved in groundwater were detected in upper perched, lower perched, and Sand-and-Gravel aquifer zones. The highest concentrations were detected beneath the AST area, followed by the UST area. The lowest concentrations were detected in the Pipeline Junction area.

The extent of soil contamination exceeding FDEP Residential SCTLs is defined within the boundaries of Site 4. Although excessively contaminated soils have been identified in all three release locations, the highest concentrations are in the AST area. The dissolved hydrocarbon plume in the upper perched zone is defined by the extent of the confining clay. The dissolved hydrocarbon plume in the lower perched zone extends beyond the Site 4 boundaries. The proposed pilot study focuses on the upper perched zone.

## 2.5 Site Geology and Hydrogeology

As stated, NAS Whiting Field is located in Santa Rosa County, approximately 5.5 miles north of Milton and 25 miles northeast of Pensacola. NAS Whiting Field is approximately 3,842 acres in size and consists of two air fields (North and South), separated by an industrial area. Site 4 encompasses 14.4 acres and is located in an industrial area between the North and South airfields. NAS Whiting Field lies within a coastal plain area known as the Western Highlands and is located on a plateau between Big Coldwater Creek and Clear Creek.

The elevation of Site 4 is 170 feet above North American Datum of 1983 (NAD83). This elevation is maintained east and west of Site 4 across the plateau. At the edges of the plateau, surface elevation decreases rapidly to the southeast and northwest of Site 4. On the plateau, elevations gradually increase to 190 feet above NAD83 to the north of Site 4, and 185 feet above NAD83 to the south of Site 4.

A relatively thick vadose zone (75 to 90 feet bls) underlies Site 4. The vadose zone is composed of varying thickness of undifferentiated sediments consisting of siliciclastics. Confining/semiconfining clay units were identified in the SAR; their continuity across the site is based on perched water behavior (CH2M HILL, 2013).

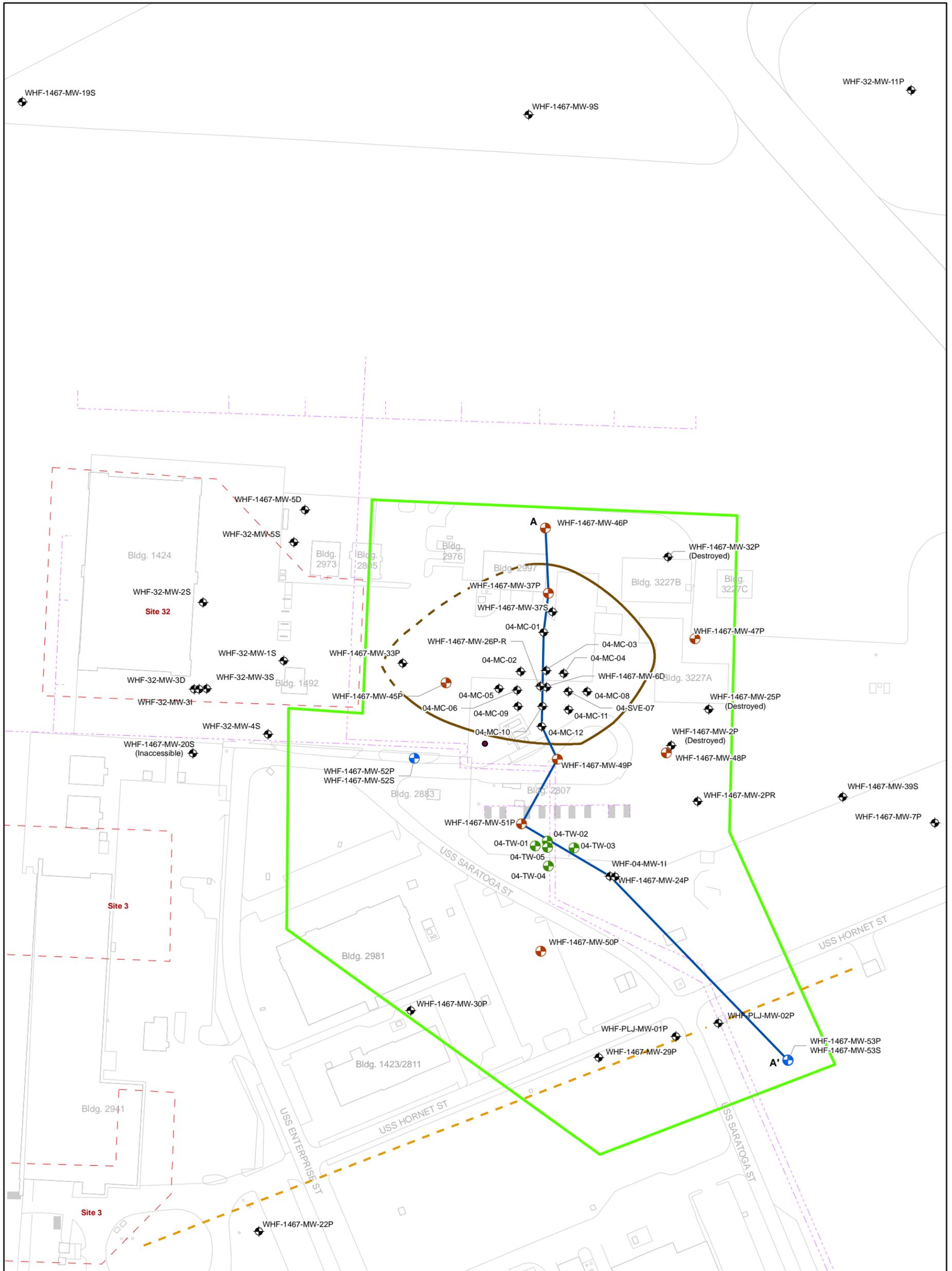
The upper perched groundwater zone is defined within the boundaries of Site 4 by the lateral extent of the confining clay. The clay is roughly the shape of a shallow bowl with the lowest edge dipping to the south. This upper unit is clearly defined with perched groundwater elevations 20 feet higher than the lower perched groundwater zone. The hydraulic gradient is relatively flat in the upper perched zone and inclined generally to the south, although well 04-MC-10 is surrounded on all four sides by wells with higher perched groundwater elevations. It is unclear whether there is a breach in the semiconfining clay in the vicinity of wells 04-MC-10 and 04-MC-12, or whether the clay lens remains intact as it dips to the south and terminates. Figures 2-3 and 2-4 present the extent of the upper perched zone in a plan view and in cross section, respectively.

Lower perched groundwater generally flows to the north-northwest along a clay lens that extends beyond site boundaries to the south and terminates in the north between monitoring wells WHF-1467-MW-37S and WHF-1467-MW-46P in the Sand-and-Gravel aquifer. The hydraulic gradient ranges from 0.000076 feet per foot (ft/ft) in the southeast to 0.03 ft/ft beneath the UST area. The gradient indicates a relatively flat lying clay in the south that steepens to the north. The confining unit pinches out and lower perched groundwater intersects the Sand-and-Gravel aquifer beneath the northern half of Site 4. The underlying Sand-and-Gravel aquifer beneath Site 4 flows to the south-southwest beneath the site.

## 2.6 Utilities and Surface Features

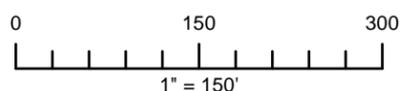
The area for the enhanced in situ biofilter pilot study is relatively flat and covered with a combination of grass and asphalt. Buildings are located approximately 150 feet or more to the north and the north-northwest of the pilot study area.

Known underground utilities include the fuel pipelines, which are located approximately as shown on Figure 2-2. The presence of other underground utilities is currently unknown; however, a utility survey, as described in Section 3.1, will be completed prior to commencement of subsurface intrusive activities.



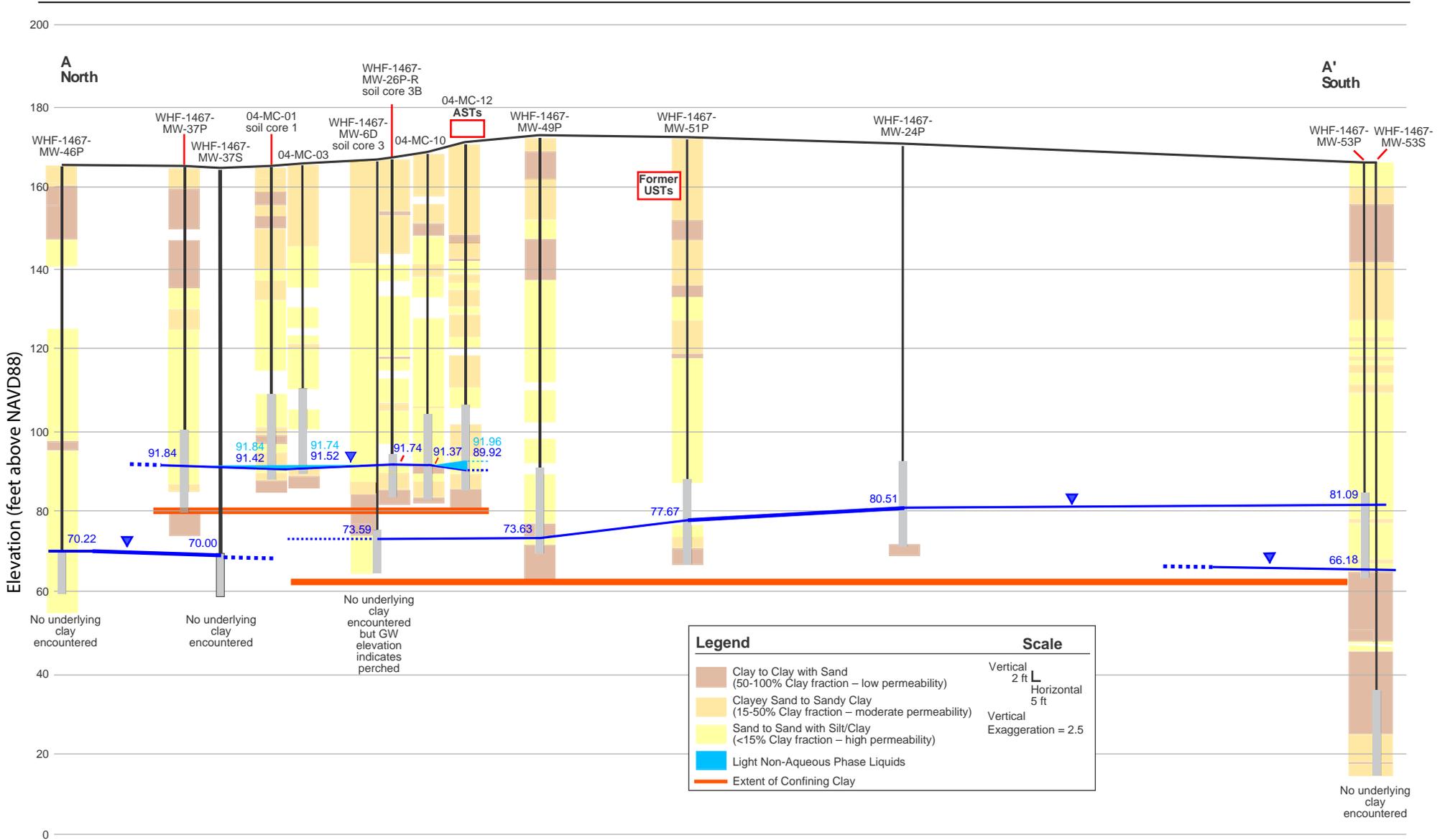
**Legend**

- 2011 Monitor Well
- ⊕ Existing Monitor Well
- 2011 Multi Completion Well
- Treatment Well
- Lateral Extent Upper Clay
- - - JP-5 Pipeline
- - - Fuel Pipeline Location
- Site 4 Boundary
- - - IR Sites



**FIGURE 2-3**  
Lateral Extent of Upper Perched Zone  
Site 4, NAS Whiting Field

Note: Dashed Where Inferred



**FIGURE 2-4**  
 Section A-A' Soil Boring Observations  
 Site 4, NAS Whiting Field



## 3.0 Project Execution Plan

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The project scope of work activities, project schedule, project organization and communications, and traffic control plan are described in this section.

### 3.1 Mobilization, Site Preparation, and Utility Clearance

This task consists of mobilizing personnel and equipment to the project site, establishing a decontamination area, and completing underground utility clearance. The decontamination area will be prepared prior to commencement of the work. AGVIQ-CH2M HILL will coordinate with Sunshine State One Call of Florida and NAS Whiting Field Facility Engineering and Acquisition Division (FEAD) to complete a site utility survey and to acquire utility layout plans of the area. In addition, AGVIQ-CH2M HILL will subcontract the services of a qualified firm to identify underground utilities in the areas targeted for the proposed biofilter trenches.

Prior to excavating the biofilter trenches, a utility locator will mark all utilities within 40 feet of the proposed biofilter footprint. Based on this utility locate, the final layout of the biofilter trenches will be staked. HDPE vapor conveyance pipes will be installed aboveground between the well and the distribution vault.

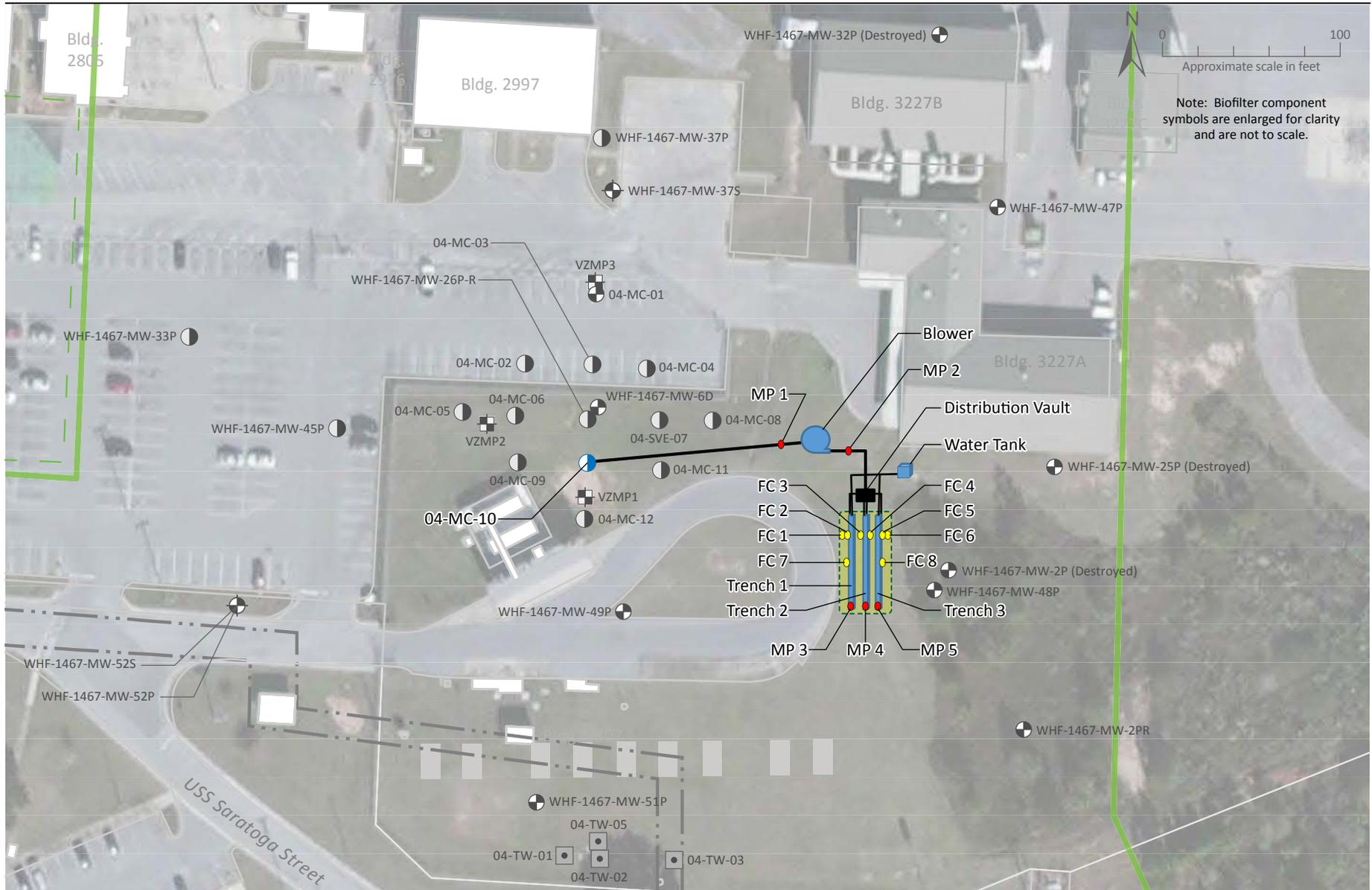
Utilities in the work areas will be marked with paint and stakes, as appropriate. A post-hole digger or hand auger will be used to advance the first 4 to 5 feet of each soil boring to look for utilities in the shallow soil. Additionally, the progress of subsurface work will be monitored continuously for evidence of obstructions.

### 3.2 Enhanced In Situ Biofilter Pilot Study

This Work Plan presents the proposed low-flow rate SVE and treatment of vapors in an engineered in situ biofilter. The general approach is to extract soil vapor from a single point within the contaminated area and treat the vapors in an engineered biofilter. The system will operate for 90 days, after which an evaluation of the data will be conducted to determine if additional testing is needed. The system is anticipated to provide positive control of hydrocarbon vapor movement away from buildings and utilities while reducing contamination levels in the subsurface.

#### 3.2.1 Pilot Study Area Layout

Three in situ biofilter trenches will be constructed at locations shown on Figure 3-1. A single SVE well (04-MC-10) will be utilized within the high soil vapor area to extract soil vapors and distribute them into shallow, in situ, vapor-phase biofilters. Treated vapors will be discharged to the atmosphere. The vapor discharges to the atmosphere will be monitored to determine biofilter treatment efficiency and to verify that emissions remain below FDEP's total hydrocarbon emission limit of 13.7 pounds per day for total hazardous air pollutants (HAPs).



**LEGEND**

- Approximate VZMP
- Existing Upper Perched MW
- Existing Sand-and-Gravel Well
- Existing Lower Perched MW
- Existing TW
- Abandoned AVGAS Pipeline
- Site 4 Boundary
- IR Site

**KEY TO BIOFILTER COMPONENTS (not to scale)**

- Proposed In-Situ Biofilter Area Location
- Biofilter Trench
- Flux Chamber (FC)
- Monitoring Port (MP)

**FIGURE 3-1**  
**Biofilter Test Layout**  
 (with sampling locations)  
 NAS Whiting Field  
 Milton, Florida



The total HAPs criteria is considered appropriate per Petroleum Cleanup Program guidance, which concludes that: “[b]ecause petroleum is a complex mixture of many compounds, it is not practical on a program-wide basis to evaluate each compound individually. Also, it is nearly impossible at most petroleum sites for any individual contaminant to exceed the individual contaminant limit without exceeding the total emission limit first.” As a result, evaluation of the HAP emissions at petroleum fuel contaminated sites will be limited to total HAPs only.” Consequently, the criteria for monitoring the biofilter performance and effectiveness will be based on the 13.7 pounds per day of total HAPs rather than the 5.5 pounds per day for any individual HAP constituent.

### 3.2.2 In Situ Biofilter Test Objective

The objective of this test is to evaluate and optimize the biofilter trench media that can provide the most effective biodegradation rates for volatile hydrocarbons present in extracted soil vapor. Test data will be used to design a full-scale system for Site 4.

### 3.2.3 In Situ Biofilter Trench Sizing

In situ biofilter sizing was based on the biofilter design background information provided in Section 1.2.1 and a Site 4 initial TVH concentration of 1,500 milligrams per cubic meter (mg/m<sup>3</sup>) and extracted flow rate of 40 scfm. The initial TVH concentration was based on measured VOC concentrations in several vapor monitoring points located in the source area at and near well 04-MC-10. This TVH concentration and flow rate will result in an initial TVH mass loading to the biofilters of 5.5 pounds per day. As a conservative design feature, the biofilters have been sized to treat up to 10 pounds per day of TVH. It has been assumed that an engineered in situ biofilter will be able to treat TVH with a loading rate of at least 0.1 pound of TVH per cubic yard of biofilter media per day. This loading rate is approximately an order of magnitude lower than aboveground engineered biofilters.

To complete this testing, existing SVE well 04-MC-10 will be used to extract fuel vapors from near the center of the site. A blower capable of producing 40 scfm will extract soil gas from SVE well 04-MC-10. Extracted soil gas will be conveyed in aboveground HDPE pipes to three in situ biofilter trenches. Each of the trenches will be 50 feet long, 6 feet deep, and 3 feet wide, and will contain approximately 33 yd<sup>3</sup> of media. Vapor distribution piping will be placed on a 6-inch bed of sand at the bottom of each trench, which will then be backfilled with a variable mix of compost, topsoil, crushed rock, and wood chips. The material in one trench also will be amended with nitrogen/phosphorous nutrients to determine if additional nutrients will stimulate vapor biodegradation. Table 3-1 summarizes the media composition of the biofilter trenches.

TABLE 3-1  
Biofilter Trench Media Composition  
Site 4, NAS Whiting Field

Biofilter Trench	Hard Wood Compost	Organic Topsoil	Hard Wood Chips	< ½-Inch Crushed Stone or Gravel	Nutrient Addition?
Trench 1	30% (14 yd <sup>3</sup> )	20% (9 yd <sup>3</sup> )	20% (9 yd <sup>3</sup> )	30% (14 yd <sup>3</sup> )	Yes
Trench 2	30% (14 yd <sup>3</sup> )	20% (9 yd <sup>3</sup> )	20% (9 yd <sup>3</sup> )	30% (14 yd <sup>3</sup> )	No
Trench 3	40% (18 yd <sup>3</sup> )	10% (5 yd <sup>3</sup> )	35% (16 yd <sup>3</sup> )	15% (7 yd <sup>3</sup> )	No
<b>Total (yd<sup>3</sup>)</b>	<b>46</b>	<b>23</b>	<b>34</b>	<b>35</b>	
<b>Density (pounds/yd<sup>3</sup>)</b>	<b>400</b>	<b>2,000</b>	<b>200</b>	<b>3,200</b>	

yd<sup>3</sup> = cubic yards

Composition by volume

Each trench will be completed with a soaker hose that runs on top of the backfilled media because keeping the media moist but not saturated is an important consideration. The media then will be covered with a 10-mil HDPE top liner to mitigate short circuiting of vapor to the surface. The top liner will extend at least 3 feet laterally beyond the top of each trench. A 12-inch layer of native soil will be used to cap each biofilter and to protect the top liner. The 12-inch soil layer will be sloped to drain surface water away from the trenches. A 2-inch piezometer will be installed to the bottom of each trench to keep track of water levels and to regulate soaker hose water addition to prevent flooding of the biofilter trenches. The filter media is more permeable than native soils and will promote vapor flow from the influent end to the effluent end of each trench. A 2-inch gas effluent sampling vent will be installed at the effluent/discharge end of the biofilter trench. The biofilter trenches will be completed in a known clean soil area, and soils removed during biofilter construction will be used as clean fill to grade the site and prevent precipitation from ponding over the biofilters. Figure 3-1 shows a plan view of the biofilter test layout. Figures 3-2A and 3-2B show cross sections of the biofilter trench configuration.

The influent flows and concentrations of TVH and VOCs + CVOCs will be tracked over time. A biofilter effluent sampling vent and surface FCs will be used to estimate the untreated TVH and VOCs + CVOCs released from the in situ biofilter. From this information, the total pounds per day of TVH and VOCs + CVOCs being treated in the biofilter will be estimated and the treatment effectiveness of each treatment media compared. The SVE system's flow and TVH mass removal rate will be controlled so that the biofilter effluent will remain below FDEP's total hydrocarbon emission limit of 13.7 pounds per day. Additional details on biofilter operations and vapor and flux sampling are provided in the following sections.

### 3.2.4 In Situ Biofilter Materials and Construction

#### Biofilter Materials Preparation

Prior to excavation of the biofilter trenches, all biofilter materials should be delivered to the site so that they are ready for immediate backfill. Table 3-1 provides the total quantities of material that should be delivered to the site and the blend for each biofilter trench. Once materials are delivered to the site, the contractor should use a front-end loader to create/mix three piles containing the backfill blend for each biofilter. Approximately 46 yd<sup>3</sup> of delivered material will be available for each of the 33-yd<sup>3</sup> biofilter trench volumes. The additional volume is to account for mixing loss and some natural compaction.

The stockpile designated for Biofilter Trench 1 will be sprayed with a nutrient solution containing soluble ammonium nitrate and soluble triple super phosphate. The goal is to achieve a nutrient concentration of 500 parts per million (ppm) nitrogen and 250 ppm phosphate in the biofilter media. Assuming a mixed media density of 1,500 pounds per yd<sup>3</sup>, the target nitrogen addition is 0.75 pound per yd<sup>3</sup> of media and the targeted phosphorous addition is 0.37 pound per yd<sup>3</sup> of media. This equates to an ammonium nitrate addition of 1.6 pounds per yd<sup>3</sup> of media and a triple super phosphate addition of 1.5 pounds per yd<sup>3</sup> of media. A 46-yd<sup>3</sup> media stockpile for Biofilter Trench 1 will require 74 pounds of ammonium nitrate and 69 pounds of triple super phosphate. Dry fertilizer should be mixed with tap water in a 100- to 200-gallon plastic tank and sprayed onto the Biofilter Trench 1 material as it is taken from the stockpile and placed into the trench.

### Trench 1 Media

- Hard Wood Compost 30%
- Organic Topsoil 20%
- Hardwood Chips 20%
- ½" crushed stones/gravel 30%
- Nutrients

### Trench 2 Media

- Hard Wood Compost 30%
- Organic Topsoil 20%
- Hardwood Chips 20%
- ½" crushed stones/gravel 30%

### Trench 3 Media

- Hard Wood Compost 40%
- Organic Topsoil 10%
- Hardwood Chips 35%
- ½" crushed stones/gravel 15%

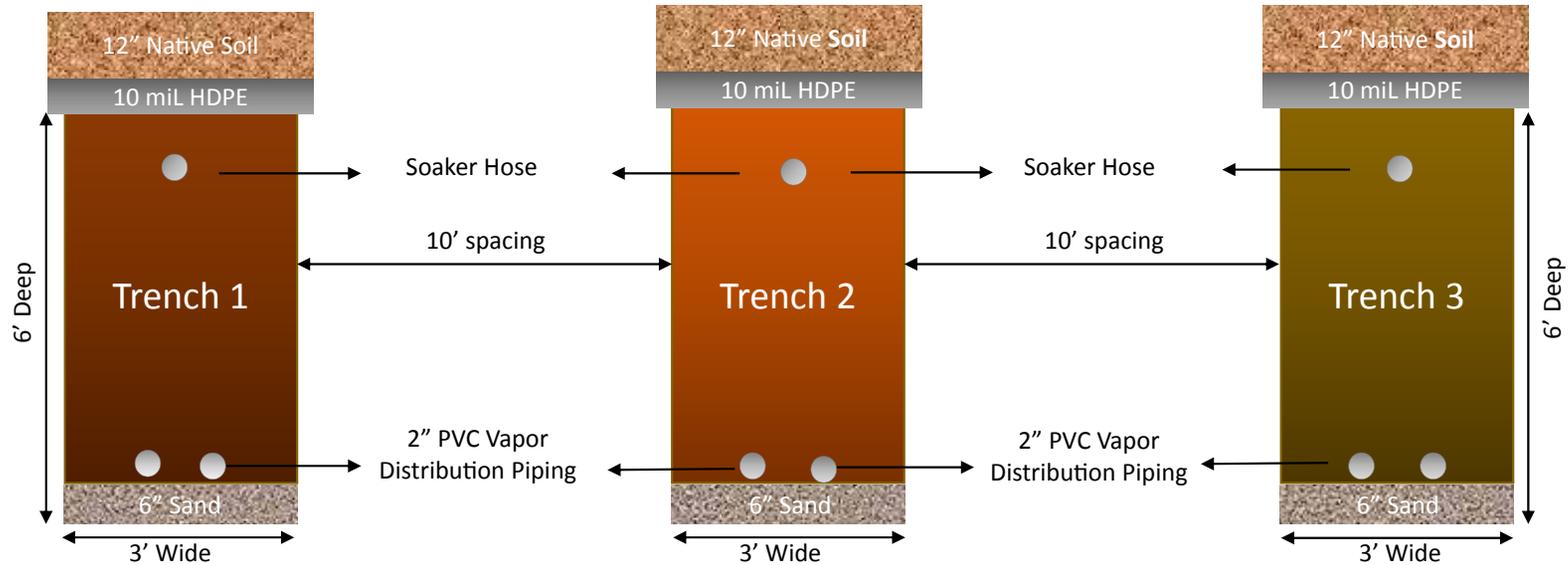


Figure Not to Scale

FIGURE 3-2A  
Cross-section (End) of Biofilter Trench Configuration  
NAS Whiting Field  
Milton, Florida



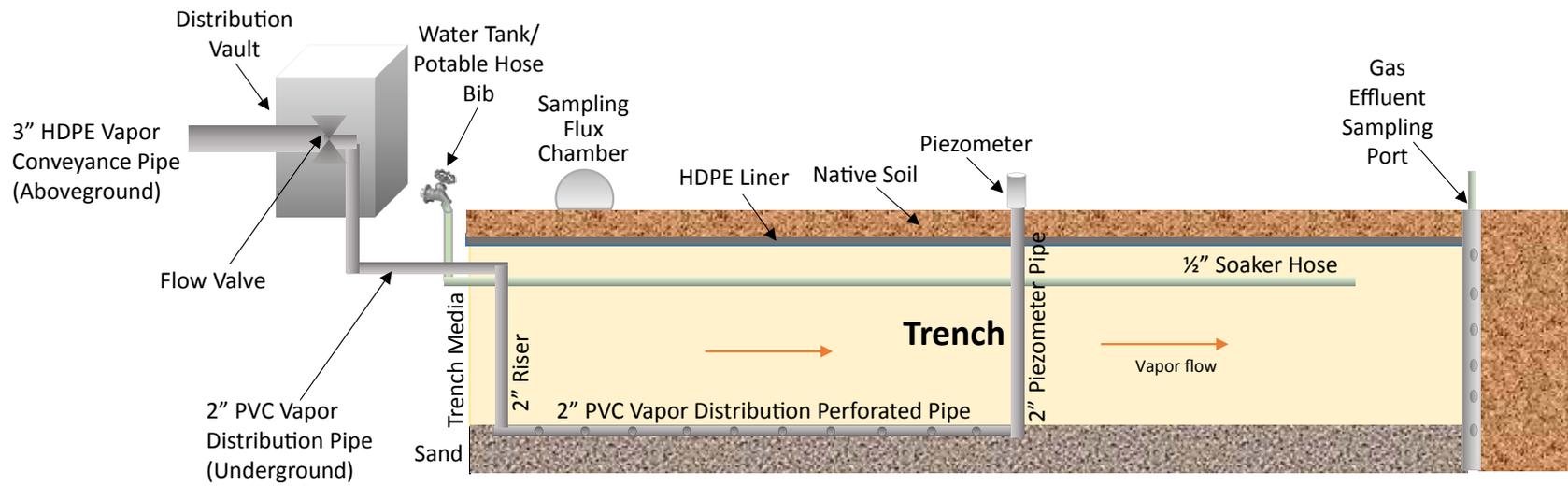


Figure Not to Scale

FIGURE 3-2B  
**Cross-section of Biofilter Trench Configuration**  
 NAS Whiting Field  
 Milton, Florida



## Excavation and Backfill

Once all biofilter media have been mixed in the three stockpiles, one trench should be excavated at a time and backfilled from its own stockpile of media. Biofilter Trench 1 should be excavated and backfilled first, followed by Biofilter Trench 2 and Biofilter Trench 3. Each biofilter trench should be excavated to approximate dimensions of 50 feet long, 6 feet deep, and 3 feet wide. Trench soils are expected to be uncontaminated and should be placed in a stockpile outside the biofilter footprint in an area that allows the loader to easily access each trench for backfill and allows the biofilter area to drain.

Backfill should begin with a 4- to 6-inch layer of sand at the bottom of Biofilter Trench 1. Two 25-foot long horizontal sections of 2-inch perforated polyvinyl chloride (PVC) vapor distribution pipe with vertical risers at each end will be placed on the sand layer (see Figures 3-2A and 3-2B for cross sections). Perforations on the vapor distribution pipes will face down. The piezometer and gas effluent sampling vent will be placed from the surface into the trench at the locations shown on Figure 3-2B. These components will need to be carefully monitored during backfill of the trenches. The biofilter media will be backfilled over the piping and extend 6 inches above the top of the excavation. At this point, the Biofilter Trench 2 excavation can begin and the backfill sequence repeated. Finally, Biofilter Trench 3 will be excavated and backfilled.

Once all three trenches have been backfilled with biofilter media, 50 feet of soaker hose will be placed down the center of each trench and bedded approximately 3 to 4 inches into the media. A 9-foot wide sheet of 10-mil HDPE liner will be centered over the top of each biofilter trench and extend 3 feet across the native soil on each side of trench. A 1-foot layer of native soil from the trench spoil stockpile will be placed over the entire biofilter area and graded to match surrounding drainage. Stockpiled topsoil will be added and the area seeded in native grass.

## Final Piping Connections

Following backfill and grading, each trench will be identified by the 2-inch riser pipes extending above the surface at each end of the trench. The riser pipes nearest to the blower will be connected to a single 3-inch vapor conveyance HDPE pipe coming from the blower. Each trench will have a separate branch pipe and valve to control vapor flow to each biofilter. A plastic aboveground distribution vault will contain the flow control valves for each biofilter trench. This distribution vault will include side ventilation panels. Piping from the valve box to the Biofilter riser pipes will be buried 6 to 12 inches bls.

The 2-inch riser pipe near the center of the trench will be used as a piezometer to measure water levels in the biofilter. This riser will be capped and placed in a small protective flush-mount vault.

## Blower Connections

The SVE blower will be installed at the approximate location shown on Figure 3-1, which is intended to represent the highest elevation of the piping. From the blower location, piping should slope down to SVE well 04-MC-10 and also down toward the biofilter trenches to reduce condensation water entering the blower. Three-inch HDPE will be used to convey air from SVE well 04-MC-10 to the blower, and from the blower to the distribution header at the biofilter trenches. The vapor conveyance piping between the well and the distribution

vault will be constructed aboveground. A water knockout drum, vacuum gauge, vacuum relief valve, manual dilution valve, and soil gas MP will be located on the vacuum side of the blower. A temperature gauge, pressure gauge, pressure relief valve, flow monitoring device, and soil gas MP will be located on the discharge side of the blower.

### **Blower Specifications**

For SVE and biofilter application, a Rotron regenerative blower model EN 454W58ML or equivalent is recommended. This 1.5-horsepower blower requires a 230-volt, 15-amp, single-phase power connection. This blower has explosion proof electrical protection and can produce 40 to 50 scfm at a total pressure across the blower of 50 to 60 inches of water. This would allow the system to extract soil vapor at 20 inches of water vacuum and inject air at 30 to 40 inches of water pressure through the biofilter. This blower size is appropriate based on the bioventing pilot test results. The blower will be housed in a small weather-proof enclosure with a control panel and fitted with a run time meter.

### **Blower Accessories and Instrumentation**

A diagram of the skid-mounted blower and accessories/instrumentation package is shown on Figure 3-3. A temperature gauge will be located immediately downstream of the blower to measure outlet temperatures that normally rise 50 to 100 degrees Fahrenheit (°F) through the blower. Because of the temperature rise, a 5-foot section of 3-inch steel piping will be used at the outlet side of the blower. Steel piping is also less prone to damage if left on the ground surface.

Three separate flow control valves (placed in the air distribution vault) will provide flow control to each separate biofilter trench. An automatic pressure relief valve will be installed on a tee downstream of the blower. The relief valve will be set to release air whenever the pressure exceeds 90 percent of the manufacturer's maximum pressure rating for the blower. This will protect the blower motor from burning out if wet conditions or a rising water table are preventing air flow into the biofilter trenches.

The extracted soil gas is expected to be below 25 percent of the gasoline LEL of 3,500 parts per million by volume (ppmv), or approximately 11,000 mg/m<sup>3</sup>, based on soil gas sampling near well 04-MC-10 that averaged 1,500 mg/m<sup>3</sup> of TVH. However, a laboratory sample of extracted gas should be collected and analyzed before selecting a flow measuring device. If extracted soil gas is below 25 percent of the gasoline LEL (approximately 3,500 ppmv of TVH in the laboratory-analyzed sample), then the air flow can be measured using a handheld thermal anemometer probe that is inserted into a 1/4- to 3/8-inch hole in the air injection pipe. A 3-inch inside diameter pipe or larger is planned for all flow measuring devices, and the probe will be inserted at least 18 inches from any valve or bend in the piping. If initial TVH concentrations higher than 3,500 ppmv are measured, the extracted air flow may be estimated from the manufacturer's blower curve or measured using a pitot tube and pressure differential to calculate air flow.

### **3.2.5 Base Support Requirements**

AGVIQ-CH2M HILL will require site access for 30 days construction of the biofilters and 90 days of testing. A 230-volt, 15-amp, single-phase power hookup will be required for the blower, as described above.

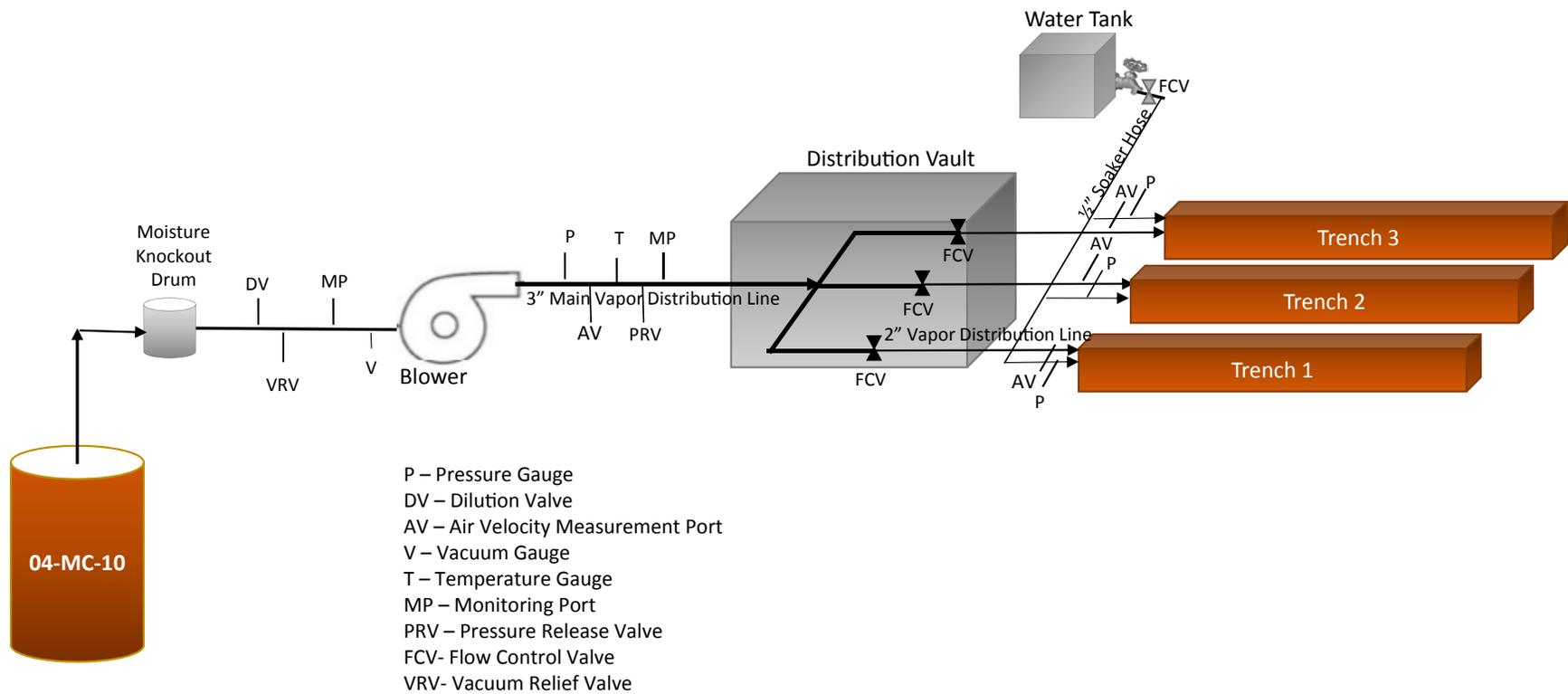


Figure Not to Scale

FIGURE 3-3  
 Equipment and Instrumentation Setup  
 NAS Whiting Field  
 Milton, Florida



### 3.3 In Situ Biofilter Test Procedures

The following procedures are recommended for evaluating the effectiveness, reliability and maintainability of the in situ biofilter technology.

#### 3.3.1 Background Flux Sampling

After construction of the biofilters and 2 weeks prior to system startup, background soil gas flux measurements will be collected at the FCs and MPs in accordance with the information shown on Figure 3-1 and listed in Table 3-2. Details of the passive soil flux sampling method is described in Section 4.3. A 7-day monitoring period has been selected because of the expected low background concentrations of VOCs + CVOCs and TVH.

The purpose of the background flux samples is to determine the additional VOCs + CVOCs and TVH surface flux (if any) the biofilter emissions are contributing to the site. It should be noted that there should be no bioventing systems operating within 300 feet of the biofilter area during the background testing.

TABLE 3-2  
Soil Gas Sampling Locations  
Site 4, NAS Whiting Field

Monitoring Location	Type	Status
FC1	Flux Chamber	Active
FC2	Flux Chamber	Active
FC3	Flux Chamber	Active
FC4	Flux Chamber	Active
FC5	Flux Chamber	Active
FC6	Flux Chamber	Active
FC7	Flux Chamber	Active
FC8	Flux Chamber	Active
MP1 *	Monitoring Port	Hold
MP2	Biofilter Influent Monitoring Port	Active
MP3	Biofilter Trench 1 Effluent Monitoring Port	Active
MP4	Biofilter Trench 2 Effluent Monitoring Port	Active
MP5	Biofilter Trench 3 Effluent Monitoring Port	Active

\* MP1 will not be sampled under normal circumstances.

FC = flux chamber  
MP = monitoring port

#### 3.3.2 System Startup

1. All vacuum and vapor distribution connections and valves will be checked to make sure they are in the proper position.

2. The dilution air valve will be completely open and initial testing will use atmospheric air (not soil gas).
3. The blower will be energized and vacuum, pressure, and temperature levels and air flow will be recorded through the system in the maintenance and monitoring log provided in Appendix E. The blower curve will be used to see if the total vacuum and pressure across the blower is matching the measured flow rate. The pressure at the gas effluent sampling vent of each biofilter will be measured to make sure there is air flow through the biofilter. Using the control valves in the air distribution box, the air flow in the gas effluent sampling vent at the end of each biofilter will be balanced.
4. After an hour of operations with the dilution valve open, the valve will be moved to the half-closed position. This should result in an increase in vacuum and a slight decrease in flow through the system. The pressures or flow rates at the end of each biofilter will be rechecked and the flow valve will be adjusted if needed to balance pressures or air flow. The system will be allowed to operate another hour with the dilution valve half-open, and then checked for stability in pressures, vacuums, and flows.
5. The dilution valve will be closed slowly to the completely closed position. This should result in a further increase in vacuum and a decrease in flow and possibly less pressure on the discharge side of the blower. The blower curve will be used to check whether the total vacuum and pressure across the blower matches the measured flow rate. The target flow rate is 35 to 50 scfm. The pressures at the end of each biofilter will be rechecked and the flow valve will be adjusted if needed to balance pressures.
6. The system will be allowed to operate with the dilution valve closed (full SVE mode) overnight. Vacuum, pressure, and flow will be rechecked. After 24 hours, a biofilter influent sample will be collected from the MP on the discharge side of the blower. Sample collection procedures are provided in Section 4.3. This will include a laboratory summa canister sample for VOCs + CVOCs and TVH analysis and O<sub>2</sub>/CO<sub>2</sub> measurements from an inflated Tedlar bag using a handheld landfill gas meter.
7. During the afternoon of the second day, a second set of summa canister samples will be collected at each of the eight soil gas FCs.

### 3.3.3 First Month Monitoring and Maintenance

The first month of biofilter operations will be used to establish operating flow rates, temperatures, and pressures, and to acclimate the biofilter media to the fuel vapor stream to promote growth of the indigenous bacteria that are capable of degrading fuel hydrocarbons.

1. After approximately 30 days of operation, the SVE and biofilter system will be checked and a second set of biofilter influent, effluent, and surface flux samples will be collected from the eight designated FCs and four designated MPs (excludes MP-1) shown on Figure 3-1 and listed in Table 3-2.
2. The SVE check will include water levels in the knock-out drum, as well as vacuum, pressure, and flow readings. All information will be recorded on maintenance and monitoring logs. Any water that has collected in the knock-out drum will be properly disposed of.

3. Biofilter influent sampling will consist of laboratory samples for VOCs + CVOCs and TVH collected with a summa canister, and O<sub>2</sub>/CO<sub>2</sub> measurements from an inflated Tedlar bag using a handheld landfill gas meter.
4. After 30 days, new summa canister samples will be collected at the eight designated FCs, and the gas effluent sampling ports.

### 3.3.4 90-Day Biofilter Assessment

During the first 90 days of operation, bi-weekly SVE system checks are recommended. After 50, 70, and 90 days of operation, a new set of biofilter influent samples and soil flux samples will be collected using the procedures described above for the 30-day sampling event and in Section 4.3. Results of the 30-, 50-, 70-, and 90-day flux sample analyses will be used to determine which biofilter media appear to be providing the best treatment of VOCs + CVOCs and TVH. Post 90-day operation scenarios are described below.

#### Long-Term Operation: Option One

By this time, the influent VOCs + CVOCs and TVH concentrations will likely have declined and it may be possible to direct most or all of the flow to one biofilter at a time. The biofilter that has the best removal efficiency will be used for long-term operations. This long-term operation would include regular moisture and or nutrient additions, and collection of one influent and effluent sample every 6 months of operation.

#### Long-Term Operation: Option Two

If all biofilters appear to be achieving similar treatment efficiencies, all of the biofilters could continue to be operated and a higher flow rate could be directed through the biofilters as the influent concentrations decrease. This long-term operation would include regular moisture and or nutrient additions, and collection of one influent and three effluent samples every 6 months of operation.

## 3.4 Site Cleanup and Restoration

Disturbed biofilter construction areas will be graded to drain and will be reseeded with native grass. All debris resulting from site activities will be managed as described in the Waste Management Plan (Appendix B).

## 3.5 Decontamination and Demobilization

As necessary, a final cleanup of all areas impacted by the pilot study activities will be performed and equipment will be decontaminated prior to leaving the site in accordance with the Accident Prevention Plan (Appendix A) and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120. Any debris generated by the biofilter construction activities will be properly containerized, sampled, analyzed as necessary, and disposed of offsite as specified in the Waste Management Plan (Appendix B). However, the only materials expected to be left over from the biofilter installation activities are natural materials (soil) that could be spread on the site surface without creating a major change to the landscape.

## 3.6 Project Schedule

Field work will begin within approximately 2 weeks following approval of this Work Plan by NAVFAC SE and FDEP. The tasks and approximate durations of the pilot study are summarized below in Table 3-3.

TABLE 3-3  
Pilot Study Schedule  
Site 4, NAS Whiting Field

Task	Duration
Base Coordination and Permitting	4 weeks
Equipment and Subcontractor Procurement	4 weeks (concurrent with above)
Biofilter Construction	4 weeks
Background Soil Gas Flux Measurements	7 days (2 weeks prior to system startup)
Biofilter Testing: 90-Day Assessment	90 days
Finalize Biofilter Testing	90 additional days (to final report)

## 3.7 Project Organization and Communications

Individual roles and responsibilities of TO personnel are summarized in Table 3-4, and the project organization chart (see Figure 3-4) depicts the chain-of-command for the individuals responsible for executing the work, as indicated. A communications matrix summarizing the lines of communications for NAVFAC SE and AGVIQ-CH2M HILL is presented in Table 3-5, and Table 3-6 provides a project personnel directory.

TABLE 3-4  
Roles, Responsibilities, and Authorities of Key Project Personnel  
Site 4, NAS Whiting Field

Role	Responsibility	Authority
TO Project Manager Amy Twitty	Provide management and technical direction of work Oversee subcontractor performance Select TO staff Develop TO Work Plan and supporting plans Meet TO Performance Objectives Prepare status reports Maintain communication with NAVFAC SE RPM and NTR	Approve subcontractor selection Approve invoices to NAVFAC SE Approve TO baseline schedule Stop work at the site for unsafe conditions or practices Approve payment to vendors and suppliers Approve payment to subcontractors
Site Engineer TBD	Responsible for site activities Provide direction to subcontractor Act for Project Manager as directed Provide daily status reports	Stop subcontractor work for unsafe conditions or practices Approve corrective action for site work-arounds

TABLE 3-4  
 Roles, Responsibilities, and Authorities of Key Project Personnel  
 Site 4, NAS Whiting Field

Role	Responsibility	Authority
	Prepare TO Work Plan Conduct daily safety meetings Review Subcontractor qualifications Monitor and oversee subcontractor compliance with scope of work Review requests for changes in scope of work Review technical qualifications of subcontractor Prepare Field Change Requests	Approve materials and labor costs for site operations Resolve subcontractor interface issues Approve daily and weekly status reports Approve Field Change Requests below ceiling amount
Transportation and Disposal Coordinator  Lisa Schwan	Develop site-specific procedures for transport and disposal Plan and coordinate the transport and disposal of waste Review subcontractor qualifications Audit T&D subcontractor compliance with contract requirements	Approve subcontractor daily report of waste material removed from the site Approve corrective action plans from T&D subcontractor
Project Assistant  Amy Wolff	Maintain TO files and correspondence Coordinate TO schedule and monitor deliverables Maintain change management records Maintain Action Tracking System log	Submit Action Tracking System log Assign correspondence log numbers
Project QC Manager/ QC Inspector(s)  TBD	Monitor and report on subcontractor quality and quantities Audit subcontractor's offsite fabrication Maintain Submittal Register Participate in Continuous Improvement Team Maintain and file Lessons Learned Log	Stop work for non-compliant operations File daily quantities report Approve resumption of work for resolved quality issues
Site Health and Safety Specialist  TBD	Monitor and report on subcontractor health and safety performance Record and report safety statistics Conduct needed site health and safety orientation Maintain Environmental Log	Stop work for unsafe practices or conditions Approve subcontractor site-specific Health and Safety Plan Set weekly safety objectives Approve resumption of work for resolved safety issues
Subcontract Specialists  Colleen Kurtz and Tammi Holley	Prepare bid packages Purchase disposable materials Maintain Subcontract log	

**TABLE 3-4**  
 Roles, Responsibilities, and Authorities of Key Project Personnel  
*Site 4, NAS Whiting Field*

<b>Role</b>	<b>Responsibility</b>	<b>Authority</b>
Project Chemist	Evaluate laboratory data	Qualify laboratory data as necessary
Camden Robinson	Coordinate with the laboratory regarding any issues with data	

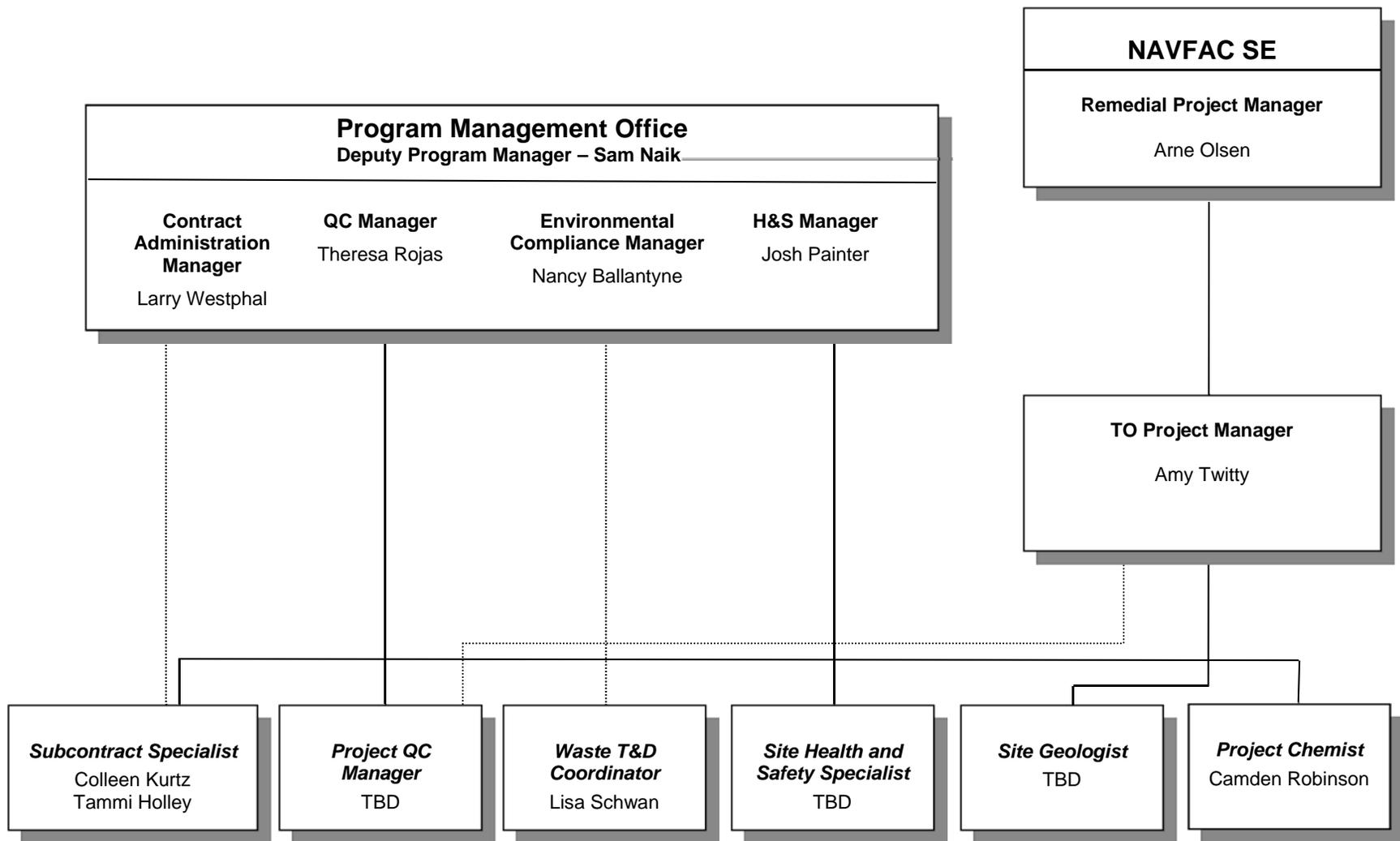
NTR = Navy Technical Representative

QC = quality control

RPM = Remedial Project Manager

T&D = transportation and disposal

TO = task order



**FIGURE 3-4**  
Project Organization Chart  
Site 4, NAS Whiting Field

TABLE 3-5  
 Communications Matrix  
 Site 4, NAS Whiting Field

CH2M HILL Position	Navy Direct Report
Sam Naik, Deputy Program Manager	Brent Kupfer, Contract Specialist
Amy Twitty, TO Project Manager	Arne Olsen, Remedial Project Manager
	Raul Carrero, FEAD

FEAD = Facility Engineering and Acquisition Division

TABLE 3-6  
 Project Personnel Directory  
 Site 4, NAS Whiting Field

Contact	Company
Sidney Allison, Program Manager Larry Westphal, Contracts Administration Manager	AGVIQ 2809 S. Lynnhaven Road, Suite 200 Virginia Beach, VA 23452 757/318-9427
Sam Naik, Deputy Program Manager Theresa Rojas, QA/QC Manager	CH2M HILL 6600 Peachtree Dunwoody Rd, 400 Embassy Row, Suite 600 Atlanta, GA 30328 770/604-9095
Amy Twitty, TO Project Manager	CH2M HILL 1766 Sea Lark Lane Navarre, FL 32566 850/232-0320
Josh Painter, Health and Safety Manager	CH2M HILL 9191 South Jamaica Street Englewood, CO 80112-5946 303/ 993-9274
Brent Kupfer, Contract Specialist	NAVFAC SE P.O. Box 30, Bldg 903 Jacksonville, FL 32212-0030 904/ 542-6924
Arne Olsen, RPM	NAVFAC SE Building 135 NAS Jacksonville, FL 32212-0030 904/ 542-6274

QA = Quality Assurance  
 QC = Quality Control  
 RPM = Remedial Project Manager  
 TO = task order

### 3.8 Traffic Control Plan

Traffic control will be the responsibility of the AGVIQ-CH2M HILL Project Superintendent. AGVIQ-CH2M HILL will minimize disturbance to NAS Whiting Field traffic patterns during project activities and consult with NAS Whiting Field personnel (both Security and Public Works) to evaluate site access, equipment placement, and traffic flow to minimize impact to base operations. Because of the confined area where the work will occur, impact should be none to minimal.

# 4.0 Sampling and Analysis Plan

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This Sampling and Analysis Plan describes the tasks and responsibilities of AGVIQ-CH2M HILL with respect to the sampling and analysis activities associated with the work described in this Work Plan. AGVIQ-CH2M HILL intends this document to be a site-specific guide for use by the field team while performing the project-required sampling and analysis activities. Any changes to the activities described in this Sampling and Analysis Plan must be documented as a revision to this plan and approved by the TO Project Manager, Project Chemist, and NAVFAC SE.

Samples will be collected in accordance with the EPA Region IV Field Branch Quality System and Technical Procedures (November 2007) and FDEP Standard Operating Procedures (SOPs) for Field Activities, DEP-SOP-001/01 (March 2008). Where the two documents conflict, the more stringent will apply.

The sampling team will be qualified under the sampling requirements listed in the Navy Installation Restoration Chemical Data Quality Manual (1999). All sample analyses will be performed by a Department of Defense Environmental Laboratory Accreditation Program accredited laboratory.

## 4.1 Data Quality Levels for Measurement Data

The data quality levels for sampling at Site 4 are listed in Table 4-1. The sampling events, sampling and analytical requirements, and required level of quality and data packages are listed in Table 4-2. The quantitation, project action, accuracy, precision, and completeness limits by which the data will be evaluated will be provided by the selected laboratory and approved by AGVIQ-CH2M HILL's Project Chemist prior to any analytical testing.

TABLE 4-1  
Data Quality Levels  
*Site 4, NAS Whiting Field*

Sampling Activity	Data Quality Level Category
Air Sampling (offsite laboratory analyses)	Definitive
Soil Gas Monitoring	Screening
Aqueous Waste Characterization (offsite laboratory analyses)	Definitive

## 4.2 Sampling Objectives

The sampling objectives for this project will be to:

- Collect background flux samples to determine the additional VOCs + CVOCs and TVH surface flux (if any) the biofilter emissions are contributing to the site.

TABLE 4-2  
 Sampling and Analysis Summary  
 Site 4, NAS Whiting Field

Sample Task	Sample Point	Matrix	Sampling Frequency	Approximate Number of Samples	Sampling Method	Sampling Equipment	TAT	DOO Level/ Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
<b>Aqueous Waste Characterization</b>													
Disposal of Aqueous Waste	Drums	Water	Once	1	Grab	Drum thief or dip jar	14 days	AGVIQ-CH2M HILL Level B	TCL Volatiles	8260B	14 days	HCl pH < 2; Cool to 4°C	(2) 40-mL vial
									TCL Semivolatiles	8270C	7 days extr; 40 days analysis	Cool to 4°C	(4) 1-liter amber glass
									TCL Pesticides	8081A	7 days extr; 40 days analysis		
									Herbicides	8151A	7 days extr; 40 days analysis		
									PCBs	8082	7 days extr; 40 days analysis		
									TAL Metals	6010B/ 7470A	180 days; Hg = 28 days	HNO <sub>3</sub> pH < 2; Cool to 4°C	(1) 500-mL HDPE
									Ignitability	1010A	ASAP	None	(1) 250-mL HDPE
									Reactivity	Chapter 7.3	ASAP	Cool to 4°C	(1) 1-liter
									Corrosivity	9040C	ASAP	None	(1) 250-mL HDPE
<b>Air Sampling</b>													
Air Sampling	8 Flux Chambers * 4 Monitoring Ports	Soil gas/air	Baseline, 30-, 50-, 70- and 90-Days Sampling	80	Grab	Summa Canisters	7 days	AGVIQ-CH2M HILL Level C	VOCs + CVOCs	TO-15	ASAP	Not Applicable	Summa Canisters

\* Flux sampling is optional and will depend on results of the 30-day flux sampling event.

- Collect soil gas samples for laboratory analysis at the biofilter FCs and MPs listed in Table 3-2 and shown on Figure 3-1. Soil gases to be monitored in the field include O<sub>2</sub> and CO<sub>2</sub>. Analytical samples are planned for collection as part of the baseline sampling (prior to biofilter operation) and following completion of the biofilter pilot study. Laboratory samples will be analyzed using EPA Method TO-15.
- Collect aqueous samples for waste characterization of any water collected in the SVE knock-out drum.

Analytical samples will be collected and analyzed in accordance with Table 4-2. Field sampling is discussed in the following sections.

### 4.3 Soil Gas Sampling

Baseline and post-pilot study soil gas samples will be collected in summa canisters for offsite laboratory analysis of VOCs + CVOCs and TVH in accordance with Table 4-2; O<sub>2</sub> and CO<sub>2</sub> will be measured from an inflated Tedlar bag using a handheld landfill gas meter. Operational soil gas field readings and laboratory samples will be collected prior to biofilter startup, during biofilter operation, and following biofilter shutdown. Table 4-3 lists the monitoring locations and sampling methods for laboratory and field measurements.

TABLE 4-3  
Sampling Details  
Site 4, NAS Whiting Field

Monitoring Location	Laboratory Analysis	Sampler	EPA Method	Field Parameters	Equipment
FC1	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC2	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC3	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC4	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC5	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC6	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC7	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
FC8	VOCs+CVOCs, TVH	Summa Canister	TO-15	NA	NA
MP1 *	NA	NA	NA	NA	NA
MP2	VOCs+CVOCs, TVH	Summa Canister	TO-15	O <sub>2</sub> , CO <sub>2</sub>	Gas Meter
MP3	VOCs+CVOCs, TVH	Summa Canister	TO-15	O <sub>2</sub> , CO <sub>2</sub>	Gas Meter
MP4	VOCs+CVOCs, TVH	Summa Canister	TO-15	O <sub>2</sub> , CO <sub>2</sub>	Gas Meter
MP5	VOCs+CVOCs, TVH	Summa Canister	TO-15	O <sub>2</sub> , CO <sub>2</sub>	Gas Meter

\* MP1 will not be sampled under normal circumstances.

CO<sub>2</sub> = carbon dioxide

CVOCs = chlorinated volatile organic compounds

FC = flux chamber

MP = monitoring port

NA = not applicable

O<sub>2</sub> = oxygen

TVH = total volatile hydrocarbons

VOCs = volatile organic compounds

Table 4-4 provides a summary of the sampling plan, including the number of locations, frequency of sampling, and number of samples.

TABLE 4-4  
Sampling Plan  
Site 4, NAS Whiting Field

Sampling Plan	Sample Locations	Frequency	Field Samples	Equipment Blank	Field Duplicate	Total Samples**
Background Sampling	8	1	8	1	1	10
Week 1	12	1	12	1	1	14
At 30 days	12	1	12	1	1	14
At 50 days	12*	1	12	1	1	14
At 70 days	12*	1	12	1	1	14
At 90 days	12*	1	12	1	1	14

\* Decision to continue flux sampling will be made after the 30-day sampling event.

\*\* Total samples collected = 80

### 4.3.1 SVE Effluent / Biofilter Influent Sampling

The effluent from the SVE system blower will become the biofilter influent. To calculate the flow into the biofilters, the gas temperature and velocity exiting the blower will be measured. A temperature gauge and a flow measuring device will be used for estimating flow to the biofilters. The manufacturer's blower curve can also be used to estimate flow based on the total vacuum and pressure measured across the blower. The concentrations of VOCs + CVOCs and TVH in the biofilter influent will be measured at the MP located on the pressure side of the blower. A piece of Tygon tubing or equivalent will be connected from the port to a 1-liter summa canister. Opening the summa canister valve will fill the canister with the extracted soil gas that is headed for the biofilter. The instructions from the laboratory regarding summa canister inspection, operation, and shipment will be followed. EPA Method TO-15 will be used for VOCs + CVOCs and TVH analysis.

### 4.3.2 Biofilter Effluent Flux Sampling

Biofilter effluent sampling will take place using two methods. The primary method will be to collect flow measurements and summa canister samples from the biofilter effluent MP located at the effluent end of each trench. The flow will be measured with a Dwyer thermal anemometer in a flow sampling port located in the 2-inch discharge piping, which will include a brass sampling hose barb connection located at least 2 feet from the discharge end of the pipe. A piece of Tygon tubing or equivalent will be connected from the brass sampling hose barb and then connected to a one-liter summa canister. Opening the summa canister valve will fill the canister with the extracted soil gas that is headed for the discharge point. The instructions from the laboratory regarding summa canister inspection, operation, and shipment will be followed. A landfill gas meter will then be connected to the biofilter effluent MP to collect O<sub>2</sub> and CO<sub>2</sub> data during each sampling event.

The second method of checking the biofilter effluent will consist of soil gas flux monitoring at the eight FCs shown on Figure 3-1. The purpose of surface flux monitoring is to determine if vapors containing VOCs + CVOCs and TVH are passing through the soil on the

sides of the trench and into the atmosphere. This will help to account for VOCs + CVOCs and TVH movement and treatment that might be occurring outside the biofilter trench. Flux sampling will be completed during the 30-day sampling event, and results will be compared to background flux sampling results to determine if any significant VOCs + CVOCs and TVH emissions are occurring through soil surrounding the trench. Based on the results, the need for flux sampling in future sampling events will be determined. If the VOCs + CVOCs and TVH flux outside the trench is minor, this monitoring will be reduced or discontinued.

The EPA soil surface flux monitoring method described in *Measurement of Gaseous Emissions Rates from Land Surfaces Using an Emission Isolation Flux Chamber* (EPA, 1986) will be used at each FC. The method consists of a stainless steel hemisphere seated 1 inch into the soil. A high purity nitrogen or zero air sweep gas is then passed through the hemisphere at 5 liters per minute for 24 minutes to establish equilibrium. At this point, a 2-liter summa canister can be connected to the discharge port and a sample collected at a rate not to exceed 2 liters per minute. The EPA method describes the details of this procedure and the method for calculating the flux of VOCs from the ground on a microgram per minute per square meter basis.

## 4.4 Waste Characterization and Disposal Sampling

Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of generated water at the site. Aqueous waste generated from the SVE knock out drum will be placed in a portable tank. One sample per portable tank will be collected. Liquid wastes will also be generated from decontamination activities. Liquids will be placed into 55-gallon drums or portable tanks for temporary accumulation. AGVIQ-CH2M HILL will collect representative samples of the decontamination wastes for waste characterization. It is estimated that two samples will be needed to perform aqueous waste characterization. Additional analyses may be necessary pending the disposal facility's requirements. The sample will be collected in the following manner and analyzed in accordance with Table 4-2.

1. Using a bailer or dip jar, collect a water sample from its containmentment.
2. First fill the sample containers for volatile analyses. The 40-milliliter vials will be filled so that there is no headspace in each vial.
3. Fill the sample containers for the remaining analyses.
4. Label and package the samples for shipment to the laboratory.

An AGVIQ-CH2M HILL Level B package will be required along with appropriate quality control (QC) samples for the required waste characterization and incidental waste material samples. All analytical data will be submitted by both hard copy and electronic format. AGVIQ-CH2M HILL will conduct in-house data validation on waste samples.

## 4.5 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and the possibility of cross-contamination. The procedure described below

will be utilized for all sampling equipment used to collect routine samples undergoing trace organic analyses.

Reusable sampling equipment will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

#### **Procedure for Teflon, Stainless Steel, and Glass Sampling Equipment (FC 1131)**

This procedure must be used when sampling for **ALL** analyte groups: extractable organics, metals, nutrients, etc., or if a single decontamination protocol is desired to clean all Teflon, stainless steel, and glass equipment.

1. Rinse equipment with hot tap water.
2. Soak equipment in a hot, sudsy water solution (Liquinox or equivalent - see FC 1001, section 1).
3. If necessary, use a brush to remove particulate matter or surface film.
4. Rinse thoroughly with hot tap water.
5. If samples for trace metals or inorganic analytes will be collected with the equipment and the equipment is not stainless steel, thoroughly rinse (wet all surfaces) with the appropriate acid solution (see FC 1001, section 4).
6. Rinse thoroughly with analyte-free water. Use enough water to ensure that all equipment surfaces are thoroughly flushed with water.
7. If samples for volatile or extractable organics will be collected, rinse with isopropanol. Wet equipment surfaces thoroughly with free-flowing solvent. Rinse thoroughly with analyte-free water (see FC 1001, section 3).
8. Allow to air dry. Wrap and seal according to FC 1003, section 6 as soon as the equipment is air-dried.
9. If isopropanol is used, the equipment may be air-dried without the final analyte-free water rinse (see FC 1131, section 8); however, the equipment must be completely dry before wrapping or use.
10. Wrap clean sampling equipment according to the procedure described in FC 1003, Section 6.

The tape and probe for the water interface probe or water level indicator will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Wash with potable water and Alconox® or equivalent laboratory grade detergent.
2. Rinse with potable water.
3. Rinse thoroughly with organic/analyte-free water.
4. Allow equipment to air dry completely.

## 4.6 Sample Documentation

A sample label will be affixed on each individual sample container. Clear tape should be placed over each label to prevent the labels from tearing off, falling off, or being smeared, and to prevent loss of information on the label. The following information will be recorded with a waterproof marker on each label:

- Project name
- Project number
- Sample identification or number
- Date and time of sample collection (24-hour clock)
- Sampler's name or initials
- Sample preservatives (if applicable)
- Analyses to be performed on the sample (specifically for the specific container and preservatives – typically for water samples only). This will be identified by the method number (or name if the number is not known).

These labels may be obtained from the analytical laboratory or printed from a computer onto adhesive labels.

For samples intended for chemical analysis, sample custody procedures will be followed through sample collection, transfer, analysis, and final sample disposal to ensure that the integrity of the samples are maintained. Custody of samples will be maintained in accordance with the sample custody procedures described below.

A sample is considered to be in custody if:

- It is on one's actual physical possession or view.
- It is in one's physical possession and has not been tampered with (i.e., it is under lock or official seal).
- It is retained in a secured area with restricted access.
- It is placed in a container and secured with an official seal such that the sample cannot be reached without breaking the seal.

Sampling documentation will include the following:

- Numbered Chain-of-Custody Forms
- Sample logbook and/or field data sheet which includes the following information:
  - Name of laboratories and contacts to which the samples were sent, turnaround time (TAT) requested, and data results, when possible
  - Termination of a sample point or parameter and reasons
  - Unusual appearance or odor of a sample
  - Measurements, volume of flow, temperature, and weather conditions
  - Additional samples and reasons for obtaining them
  - Levels of protection used (with justification)

- Meetings and telephone conversations held with the NAVFAC SE, Navy Technical Representative (NTR), regulatory agencies, project manager, or supervisor
- Details concerning any samples split with another party
- Details of QC samples obtained
- Sample collection equipment and containers, including their serial or lot numbers
- Field analytical equipment, and equipment utilized to make physical measurements
- Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
- Property numbers of any sampling equipment used, if available
- Sampling station identification
- Date and Time of sample collection
- Description of the sample location
- Description of the sample
- Sampler(s)' name(s) and company
- How the sample was collected
- Diagrams of processes
- Maps/sketches of sampling locations
- Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals (minimum of two on each shipping container)

## 4.7 Sample Nomenclature

All field samples and field QC samples will be designated a unique sample identification. The sample identification procedure will be implemented for the following types of environmental samples collected.

- Waste Characterization Samples and Air Samples
  - TO Number-Location-Environmental Media-Month and Date-Year
  - Environmental Media: S (Soil), SL (Sludge), SW (Surface Water), GW (Groundwater), WW (Wastewater), and A (Air)
  - Month and Date: Four digit number representing the month and date (e.g., 0402 is April 2)
  - Year: Last two digits of the calendar year (e.g., 14 is the calendar year 2014)

An example of the sample identification protocol is a sample event conducted under TO No. JM19 from Flux Chamber 1 (FC1) of soil vapor collected on July 1, 2015. This example has the following identification number: JM19-FC1-V-0701-15.

## 4.8 Cross-Contamination Minimization

Cross-contamination is the introduction of contaminants into the sample through the sampling and/or sample-handling procedures. It can cause an otherwise representative sample to become non-representative. The most important means of minimizing cross-contamination are as follows:

- Sampling expendables, i.e., sample gloves, pipettes, string, dip jars, etc., must not be reused. Used expendables should be labeled so they are not confused with non-contaminated trash.
- Minimum contact should be made between the sampler and the sample medium. For example, a sampler should not walk across a contaminated area and then take a surface soil sample where (he/she) has just stepped.
- Sample collection activities should proceed progressively from the least contaminated area to the most contaminated area.
- Sampling equipment should be constructed of Teflon, stainless steel, or glass that has been properly pre-cleaned for collecting samples. Equipment constructed of plastic or PVC should not be used to collect samples for trace organic analyses.
- Any tools used in sampling must be carefully decontaminated prior to first use and after each sample.

Activities that could contaminate samples are prohibited in the sample handling and preparation area. These activities and the possible contaminants include:

- Smoking - PAHs
- Spraying for insects - pesticides, oils, solvents
- Spraying for weeds - herbicides, oils, solvents
- Refueling - VOCs + CVOCs, hydrocarbons
- Painting and paint stripping - solvents

## 4.9 Field Quality Control

Field duplicate samples and equipment blank samples will be collected at a minimum frequency of 10 percent of the total number of samples collected for an analysis and rounded to the nearest whole number, as described below. One trip blank sample will be provided at a frequency of one per sample cooler containing VOC samples. Matrix spike/matrix spike duplicate (MS/MSD) samples will be required at a frequency of one per sample event or a minimum of 5 percent of the total number of samples collected for an analysis (rounded to the nearest whole number). Quantity and frequency of QC samples are detailed in Table 4-2.

### 4.9.1 Equipment Blanks

One equipment blank sample per 10 field samples will be prepared in the field. This will consist of a summa canister that is opened to the atmosphere to help account for any ambient air contaminants in the biofilter area.

## 4.9.2 Field Duplicates

Field duplicate samples that represent ten percent of the field samples collected will be split into two separate portions. These two portions will be collected at the same time as two separate samples and placed under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analyses of both samples give a measure of the precision associated with sample collection, preservation and storage, as well as with laboratory procedure.

## 4.9.3 Sampling Containers, Analytical Methods, Preservatives, and Holding Times

The analytical method, preservative, sampling containers, and holding times for the air and waste characterization samples are described in Table 4-2 of this Work Plan. The sample containers will be provided by a Department of Defense Environmental Laboratory Accreditation Program certified laboratory. This laboratory will be responsible for the chemical analysis of the field samples and quality assurance (QA)/QC samples.

## 4.10 Analytical Methods

Samples will be collected for analytical methods summarized in Table 4-2. All analytical results will be internally validated by an AGVIQ-CH2M HILL Project Chemist.

The data for the aqueous waste disposal sampling will be validated at a Level B evaluation. For Level B review, all reported hard copies and electronic data deliverables from the subcontracting laboratory will be verified for completeness; however, data calculation confirmation, as well as instrument raw data, and initial and continuing calibrations validation will be excluded. Naval Installation Restoration Information System electronic data deliverables will be submitted.

Preliminary analytical results from the laboratory will be faxed to Bethany Garvey per the TAT listed in Table 4-2 from day of sample receipt. The final hard copy data and electronic file will be delivered to Kama White within 14 days of sample receipt.

Contact information for Bethany Garvey and Kama White is included below:

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---

The following references were consulted during the preparation of this Work Plan, although not all are cited in the text:

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**Appendix A**  
**Accident Prevention Plan**

---

# Accident Prevention Plan

Enhanced In Situ Biofilter Pilot Study  
Site 4 - North AVGAS Tank Sludge Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Revision No. 00

Contract No. N624670-08-D-1006  
Task Order No. JM19

Submitted to:



Prepared by:



July 2015

# Contents

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<b>Acronyms and Abbreviations .....</b>	<b>vii</b>
<b>1.0 Signature Sheet.....</b>	<b>1-1</b>
1.1 Revisions.....	1-2
1.2 Introduction.....	1-3
<b>2.0 Background Information .....</b>	<b>2-1</b>
2.1 Facility and Site Background .....	2-1
2.1.1 Site 4 Information .....	2-1
2.2 General Task Order Scope of Work .....	2-2
2.3 Health and Safety Plan Assumption Set .....	2-3
2.4 HAZWOPER-Regulated Tasks.....	2-3
2.5 Non-HAZWOPER-Regulated Tasks.....	2-4
<b>3.0 Statement of Safety and Health Policy .....</b>	<b>3-1</b>
3.1 Purpose .....	3-2
3.2 Objectives.....	3-2
3.3 Accident Goals for this Contract and Program.....	3-2
<b>4.0 Responsibilities and Lines of Authorities.....</b>	<b>4-1</b>
4.1 Organization and Responsibility for Health and Safety .....	4-2
4.1.1 Program Manager.....	4-2
4.1.2 Project Manager .....	4-2
4.1.3 Certified Industrial Hygienist.....	4-3
4.1.4 Health and Safety Program Administrator(s) .....	4-4
4.1.5 Site Supervisors .....	4-4
4.1.6 Site Safety and Health Officer.....	4-6
4.1.7 AGVIQ-CH2M HILL Program Participants .....	4-7
4.2 Employee Competency .....	4-8
4.2.1 Presence of Competent Person On-Site.....	4-8
4.3 Requirements for Pre-task Safety and Health Analysis.....	4-8
4.4 Lines of Authority .....	4-8
4.5 Non Compliance with Safety Requirements .....	4-10
4.6 Procedures for Holding Managers and Supervisors Accountable for Safety .....	4-11
<b>5.0 Subcontractors and Suppliers.....</b>	<b>5-1</b>
5.1 Identification of Subcontractors and Suppliers (if known) .....	5-1
5.2 Safety Responsibilities of Subcontractor/Supplier.....	5-1
<b>6.0 Training.....</b>	<b>6-1</b>
6.1 New Hire SOH Orientation Training .....	6-1
6.2 Requirements for Mandatory Training and Certificates.....	6-2
6.3 Procedures for Periodic Safety & Health Training of Supervisors and Employees .....	6-4
6.4 Requirements for Emergency Response Training .....	6-4
<b>7.0 Safety and Health Inspections.....</b>	<b>7-1</b>
7.1 External Inspections/Certifications.....	7-2

<b>8.0</b>	<b>Accident Reporting and Investigation.....</b>	<b>8-1</b>
8.1	Exposure Data (man-hours worked).....	8-1
8.2	Accident Investigations, Reports and Logs.....	8-2
8.2.1	Best Management Practices for Incident Investigation .....	8-4
<b>9.0</b>	<b>Plans Required by the Safety Manual .....</b>	<b>9-1</b>
9.1	Layout Plans (04.A.01).....	9-1
9.2	Emergency Response Plans (01.E) .....	9-1
9.2.1	Emergency Planning/Preparedness .....	9-1
9.2.2	Emergency Equipment and Supplies.....	9-2
9.2.3	Evacuation .....	9-2
9.2.4	Procedures and Tests (01.E.01).....	9-3
9.2.5	Spill Plans (01E.01, 06.A.02).....	9-3
9.2.6	Firefighting Plan (01.E.01, Section 19).....	9-5
9.2.7	Posting of Emergency Telephone Numbers (01.E.05) .....	9-6
9.2.8	Man Overboard / Abandon Ship (19.A.04) .....	9-6
9.2.9	Medical Support.....	9-6
9.3	Plan for Prevention of Alcohol and Drug Abuse (01.C.02) .....	9-9
9.4	Site Sanitation Plan (2).....	9-9
9.5	Access and Haul Road Plan (4.B).....	9-9
9.6	Respiratory Protection Plan (05.G).....	9-9
9.7	Health and Safety Hazard Control Program (06.A).....	9-10
9.7.1	Adverse Weather .....	9-10
9.7.2	Lightning.....	9-11
9.7.3	Aerial Lifts .....	9-11
9.7.4	Air Compressor Operations .....	9-11
9.7.5	Asbestos.....	9-12
9.7.6	Biological Hazards and Controls.....	9-12
9.7.7	Buried Objects/Utilities (locating) .....	9-25
9.7.8	Chemical Injections.....	9-28
9.7.9	Concrete Work.....	9-28
9.7.10	Confined Space Entry .....	9-28
9.7.11	Cranes .....	9-29
9.7.12	Demolition .....	9-29
9.7.13	Drilling/Direct Push Technology.....	9-29
9.7.14	Electrical Safety .....	9-29
9.7.15	Excavation Activities .....	9-31
9.7.16	Fall Protection.....	9-33
9.7.17	Fire Prevention .....	9-33
9.7.18	Flight Line Safety .....	9-35
9.7.19	General Practices and Housekeeping .....	9-35
9.7.20	Hand and Power Tools .....	9-36
9.7.21	Haul Trucks .....	9-37
9.7.22	Heavy Equipment.....	9-38
9.7.23	Land Clearing Operations - General .....	9-38
9.7.24	Lock-Out/Tag-Out .....	9-38
9.7.25	Manual Lifting.....	9-39
9.7.26	Noise .....	9-40

9.7.27	Pressure Washing Operations .....	9-40
9.7.28	Sample Handling.....	9-41
9.7.29	Slips, Trips and Falls .....	9-41
9.7.30	Stairways and Ladders .....	9-42
9.7.31	Vacuum Truck Operations.....	9-43
9.7.32	Vehicular Traffic (Exposure to) .....	9-43
9.7.33	Visible Lighting .....	9-44
9.7.34	Welding or Cutting Operations.....	9-45
9.7.35	Working Alone .....	9-45
9.7.36	Working Around Material Handling Equipment.....	9-45
9.7.37	Working on or Over Water .....	9-46
9.8	Hazard Communication Program (06.B.01) .....	9-46
9.8.1	Shipping and Transportation of Chemical Products.....	9-47
9.9	Process Safety Management (06.B.04) .....	9-47
9.10	Lead Abatement Plan (06.B.05).....	9-47
9.11	Asbestos Abatement Plan (06.B.05).....	9-48
9.12	Radiation Safety Program (06.E.03) .....	9-48
9.13	Abrasive Blasting (06.H.01).....	9-48
9.14	Heat/Cold Stress Monitoring Program (06.I.02).....	9-48
9.14.1	Heat Stress Monitoring and Prevention.....	9-48
9.14.2	Monitoring Heat Stress.....	9-51
9.15	Crystalline Silica Monitoring Plan (06.M).....	9-53
9.16	Night Operations Lighting Plan (07.A.08) .....	9-53
9.17	Fire Prevention Plan (09.A) .....	9-53
9.18	Wild Land Fire Management Plan(09.K) .....	9-53
9.19	Hazardous Energy Control Plan (12.A.01) .....	9-53
9.20	Critical Lift Plan (16.H).....	9-53
9.21	Contingency for Severe Weather Plan (19.A.03) .....	9-53
9.22	Float Plan (19.F.04) .....	9-54
9.23	Site Specific Fall Protection and Prevention Plan (21.C).....	9-54
9.24	Demolition Plan(23.A.01) .....	9-54
9.25	Excavation/Trenching Plan (25.A.01) .....	9-54
9.26	Emergency Rescue (Tunneling) (26.A).....	9-54
9.27	Underground Construction Fire Prevention and Protection Plan (26.D) .....	9-54
9.28	Compressed Air Plan (26.I.01) .....	9-54
9.29	Formwork Shoring and Removal Plan (27.C) .....	9-55
9.30	Precast Concrete Plan (27.D).....	9-55
9.31	Lift Slab Plan (27.E) .....	9-55
9.32	Steel Erection Plan (27.F) .....	9-55
9.33	Site Safety and Health Plan of HRTW Work (28.B).....	9-55
9.34	Blasting Safety Plan.....	9-55
9.35	Diving Plan.....	9-55
9.36	Confined Space Program.....	9-55
<b>10.0</b>	<b>Risk Management Process.....</b>	<b>10-1</b>
10.1	Activity Hazard Analysis.....	10-1
10.2	Pre-Task Safety Plans.....	10-2

10.3 Loss Prevention Observations.....10-4  
    10.3.1 Deficiency Tracking System .....10-4  
10.4 Loss/Near-Loss Investigations .....10-5  
10.5 Drug-Free Workplace Program .....10-5  
10.6 Project Specific Activity Hazard Analyses .....10-5

**Attachments**

1 Site Safety and Health Plan  
2 APP and SSHSP Acknowledge Form  
3 Subcontractor H&S Tracking Form  
4 Project H&S Forms/Permits  
5 Emergency Contact List  
6 Material Safety Data Sheets  
7 Chemical-Specific Training Form and  
Project-Specific Chemical Product Hazard Communication Form  
8 Pre-Task Safety Plan (PTSP)  
9 Loss Prevention Observation (LPO) Form  
10 Incident Report Form (IRF)  
Loss/Near Loss Incident (L/NLI) Report Form  
Root Cause Analysis (RCA)  
11 Hurricane Preparedness Plan (RESERVED)

**Figures**

4-1 AGVIQ-CH2M HILL Incident Notification Process & Line Authority  
9-1 Hospital Route Map

**Tables**

10-1 Activity Hazard Analysis Basis

# Acronyms and Abbreviations

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APP	Accident Prevention Plan
AGVIQ-CH2M HILL	AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
AAST	aboveground storage tank
AVGAS	aviation gasoline
BBLPS	Behavior Based Loss Prevention System
BLS	United States Bureau of Labor Statistics
bls	below land surface
CFR	Code of Federal Regulations
CIF	Controlled Industrial Facility
CIH	Certified Industrial Hygienist
COC	chemical of concern
CPR	cardiopulmonary resuscitation
CSIR	Contractor Significant Incident Report
DART	Days Away, Restriction, or Transfer
DEET	N, N-diethyl-meta-polyamide
DFOW	Definable Feature of Work
DFWP	Drug Free Workplace Program
DON	Department of the Navy
DOT	U.S. Department of Transportation
EMS	Emergency Medical Services
ER	Emergency Response
FA	first aid
FDEP	Florida Department of Environmental Protection
FTL	Field Team Leader
GFCI	ground fault circuit interrupter
GDA	Government Designated Authority
GPR	ground penetrating radar

H&S	Health and Safety
HS&E	Health, Safety, and Environment
HITS	Hours and Incident Tracking System
HR	heart rate
HSP	Health and Safety Program
HSPA	Health and Safety Program Administrator
IR	Incident Rate
IRF	Incident Report Form
kV	kilovolt
LLC	Limited Liability Company
LPO	Loss Prevention Observation
mg/m <sup>3</sup>	milligrams per cubic meter
MLLW	Mean Lower Low Water
MEC	Munitions and Explosives of Concern
MOGAS	motor gasoline
MPPEH	Materials Potentially Presenting an Explosive Hazard
MSDS	Material Safety Data Sheet
NAICS	North American Industry Classification System
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command Southeast
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PACM	Presumed Asbestos Containing Material
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Limit (OSHA)
POC	Point of Contact
PPE	Personal Protective Equipment
ppm	parts per million
PRGs	Preliminary Remedial Goals
PTSP	Pre-Task Safety Plan
QC	Quality Control Plan
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Process
RPM	Remedial Project Manager

SAP	Sampling and Analysis Plan
SBRAC	Small Business Remedial Action Contract
SOH	Safety and Occupational Health
SOP	Standard Operating Procedure (CH2M HILL)
SSHO	Site Safety and Health Officer
SSHSP	Site Safety and Health and Safety Plan
SWO	Stop Work Order
TO	Task Order
UST	underground storage tank

# 1.0 Signature Sheet

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## Plan Prepared By:

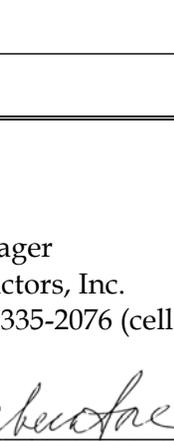
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## Plan Concurrence:

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Date: March 25, 2014

Signature:   
Amy Twitty

## 1.1 Revisions

**Revisions Made By:** Josh Painter

**Date:** July 2015

---

**Revisions to Plan:** Plan made specific to Enhanced In Situ Biofilter Pilot Study.

**Revisions Approved By:** Amy Twitty

**Date:** July 2015

---

## 1.2 Introduction

AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III (AGVIQ-CH2M HILL) was contracted by U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE) to perform activities for the construction, startup, and operation of an in situ biofilter system at Site 4, (Operational Unit [OU]-4) the North Aviation Gasoline (AVGAS) Tank Sludge Disposal Area, Naval Air Station (NAS) Whiting Field, Milton, Florida. Work will be completed under Contract No. N624670-08-D-1006, Task Order (TO) No. JM19.

This Accident Prevention Plan (APP) has been developed to address applicable requirements set forth by 29 Code of Federal Regulations (CFR) 1910, 29 CFR 1926, and the U.S. Army Corps of Engineers, EM 385 1-1, "Safety and Health Requirements Manual." It is understood that NAVFAC prime contract # N62470-08-D-1006 issued for the AGVIQ-CH2M HILL Small Business Remedial Action Contract (SBRAC) was issued prior to September 15, 2008, and as such the 3 November 2003 version of the EM 385 1-1 shall be applicable the execution of this TO work. However, AGVIQ-CH2M HILL will endeavor to implement the September 15, 2008 version for this project where ever it is feasibly possible. It should be noted that the content of this APP has been to prepared to address the requirements set forth by EM 385 1-1, Appendix A, September 15, 2008.

This APP must be available onsite for reference by site personnel. Means and methodology for execution of TO tasks are detailed in the Enhanced In Situ Biofilter Pilot Study Work Plan for Site 4 - North AVGAS Tank Sludge Disposal Area (referred to as the Work Plan throughout this document) which includes this APP. The Work Plan and its attached support documents are not intended to be executed as separate documents. Therefore, any means and methods identified within the Work Plan or its support documents will not be significantly elaborated upon herein, in an effort to minimize duplicity or erroneous information.

All site personnel, including AGVIQ-CH2M HILL and subcontractor personnel, who may be covered by this APP must review or be provided a detailed briefing on the contents of this document and sign the Acknowledgement Form (Attachment 2).

## 2.0 Background Information

---

**CONTRACTOR:** AGVIQ-CH2M HILL Joint Venture III  
Small Business Remedial Action Contract (SBRAC)  
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Title: Project Manager (overall)  
Cell Phone: (850) 232-0320

**CONTRACT#:** Number N62470-08-D-1006  
**(PRIME)** Contract Task Orders JM19

**PROJECT NAME:** Enhanced In Situ Biofilter Pilot Study for Site 4 - North  
AVGAS Tank Sludge Disposal Area at  
Naval Air Station Whiting Field  
Milton, Florida

### 2.1 Facility and Site Background

NAS Whiting Field is located in Santa Rosa County, in Florida's northwest coastal area, and is approximately 5.5 miles north of Milton and 25 miles northeast of Pensacola. The station has served as a naval aviation training facility since it was established as a naval air auxiliary station in July 1943. The area includes approximately 190,000 square feet or 3.4 acres of land that is grass covered, except for the asphalt covering on the roads.

#### 2.1.1 Site 4 Information

Site 4 includes the former underground storage tank (UST) facility (designated as UST Site 1467), which contained eight 25,000-gallon steel USTs and one 15,000-gallon steel UST. AVGAS was piped from the Site 4 UST system to the dispensing or delivery locations (hydrant area). According to historical documents, the nine USTs were installed in 1943. The eight 25,000-gallon steel tanks initially contained AVGAS and the 15,000-gallon tank initially contained gasoline. Sometime between 1968 and 1973, the contents of the 25,000-gallon tanks were switched from AVGAS to diesel or to unleaded gasoline. From 1973 to 1984, six of the 25,000-gallon tanks were filled with water. Three tanks (1467-F, -G, and -H) remained in use for storage of gasoline, diesel, and contaminated jet fuel, respectively. Eight USTs were excavated and removed in 1992, and a Discharge Reporting Form was submitted to FDEP for each of the USTs removed (Sub-Tech, Inc., 1992). Two aboveground storage tanks (ASTs) were installed in 1993 for storage of motor gasoline (MOGAS) and diesel fuel. The AST dispensing island is located parallel to and southeast of the MOGAS tanks.

The JP-5 underground product line generally lies at a depth of approximately 3 feet below land surface (bls), except for an aboveground junction with the AVGAS pipeline and an exposed portion near the pump station facility. The 10-inch metal product line was affiliated with two 231,000-gallon ASTs containing JP-5. The pipeline was taken out of service through in-place closure in 1996.

The 6-inch AVGAS pipeline used to transfer fuel from the north fuel storage area to the south fuel storage area was closed in place sometime between August 29, 2000 and September 1, 2000. Attempts to clean the pipeline with soft foam pigs prior to closure were not successful because the pipelines were filled with water. To close the AVGAS pipeline, 1,700 gallons of water were removed for offsite disposal. Pipeline ends were capped using a soft foam plug inserted 1.5 feet into the pipeline and grouted with 40 pounds of QUIKRETE®.

## 2.2 General Task Order Scope of Work

The scope of work (SOW) is detailed in the Enhanced In Situ Biofilter Pilot Study Work Plan. Specific work procedures, plans, and drawings are detailed in the Work Plan and will not be elaborated herein.

The project SOW includes the following tasks:

1. Mobilization, Site Preparation, and Utility Clearance
  - Mobilizing personnel and equipment
  - Establishing a decontamination area
  - Utility survey of excavation sites
2. Enhanced In Situ Biofilter Pilot Study
  - In Situ Biofilter Materials and Construction
    - Biofilter Materials Preparation
    - Excavation and Backfill
    - Biofilter Piping/Materials Installation
    - Final Piping Connections
    - Blower Connections
  - In Situ Biofilter Test Procedures
    - Background Flux Sampling
    - System Startup
    - First Month Monitoring and Maintenance
    - 90-Day Biofilter Assessment
    - Long-Term Biofilter Assessment
3. Site Cleanup and Restoration
4. Decontamination and Demobilization

For the purposes of developing and executing project Activity Hazard Analyses (AHAs) from a health and safety requirements and task hazard control perspective, a summary of the major Definable Features of Work (DFOWs) to complete the execution of this TO are as follows:

1. Mobilization, Site Preparation, and Utility Clearance
2. In Situ Biofilter Pilot Study

3. Site Cleanup and Restoration
4. Decontamination and Demobilization

AHAs associated with the execution of this work are included in Section 10.6 Project Specific Activity Hazard Analyses of this APP.

## 2.3 Health and Safety Plan Assumption Set

The assumption set for the development of this APP is that AGVIQ-CH2M HILL site personnel and subcontractors controlled by AGVIQ-CH2M HILL who may be covered by this APP are based on the following:

No Chemical, Biological, Nuclear or Radioactive (CBNR) weapon/agent, material potentially presenting an explosive hazard (MPPEH) or munitions and explosives of concern (MEC) or presumed asbestos containing material (PACM) or asbestos containing material (ACM) will be encountered during the execution of this task order. All site work must cease if it is suspected that these items are onsite.

It is assumed that the performance of Non-Hazwoper regulated tasks in Section 2.5 below, that workers will not be exposed to residual/released site chemicals of concern (COCs) during the execution of these tasks. If this is not the case, then these functions will be considered Hazwoper-Regulated under Section 2.4 of this APP.

Work is being performed in an open air, well ventilated environment.

Where content in this APP is marked as (Reserved) or otherwise defined as not applicable, then activities associated with these areas, activities or hazards not specifically covered under this APP and must not be performed unless this APP is amended, as necessary.

In the event that the above assumption set is not verified, the conditions of this APP shall be re-evaluated and amended as necessary to address applicable hazards that maybe associated with newly encountered project conditions or newly defined project tasks. In the event that it is determined that site soil, ground water sediment may be impacted by COCs concentrations in excess of established Occupational Exposure Limits (OELs) or CBRN, MEC/MPPEH or PACM/ACM exposure at any level could occur, work shall cease until such engineering or administrative control measures and/or Personnel Protective Equipment (PPE) are implemented to reduce potential worker exposures to acceptable levels.

## 2.4 HAZWOPER-Regulated Tasks

Where certain work tasks include the handling, removal, containment, investigation or other physical site management of hazardous waste/material or other regulated materials, execution of such tasks and potential employee exposure to chemical hazards associated with these tasks may be regulated under 29 CFR 1910.120/29 CFR 1926.65. For this task order, following activities will be considered Hazardous Waste Operations (HAZWOPER)-regulated tasks because of the potential worker exposure to identified site contaminants.

### **Enhanced In Situ Biofilter Pilot Study**

- In Situ Biofilter Materials and Construction (when performed on potentially contaminated soils or when system is connected to SVE well)

- Biofilter Materials Preparation
- Excavation and Backfill
- Biofilter Piping/Materials Installation
- Final Piping Connections
- Blower Connections
- In Situ Biofilter Test Procedures
  - Background Flux Sampling
  - System Startup
  - First Month Monitoring and Maintenance
  - 90-Day Biofilter Assessment
  - Long-Term Biofilter Assessment
- Decontamination and Demobilization

## 2.5 Non-HAZWOPER-Regulated Tasks

HAZWOPER regulations under 29CFR1910.120/29CFR1926.65 may be not applicable. Where this is considered, it must be demonstrated that the assigned tasks can be performed without the possibility of exposure to chemical hazards in order to use personnel who do not meet the criteria established by these standards. A determination from the AGVIQ-CH2M HILL Program Certified Industrial Hygienist (CIH) is required before project tasks are conducted by personnel who do not meet the requirements of 29CFR1910.120/29CFR1926.65 and where there is question to potential exposure to chemical hazards by site workers. Where it is unlikely or not possible that workers could not be exposed to site chemical hazards during the normal execution of assigned tasks, the task can be considered a Non-Hazwoper Regulated Task. For this project, the following activities can be considered Non-Hazwoper Regulated Tasks.

- Mobilization, Site Preparation, and Utility Clearance
  - Mobilizing personnel and equipment
  - Establishing a decontamination area
  - Utility survey of excavation sites
- Enhanced In Situ Biofilter Pilot Study (when performed on potentially contaminated soils or when system is connected to SVE well)
  - In Situ Biofilter Materials and Construction
    - Biofilter Materials Preparation
    - Excavation and Backfill
    - Biofilter Piping/Materials Installation
- Site Cleanup and Restoration
- Demobilization

## 3.0 Statement of Safety and Health Policy

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The measurement of a successful program includes our ability to execute profitably, on time, without violations and safely. Success can only be achieved when all four components are integrated; therefore, health and safety must be part of every operation, at every responsibility level. It is the intent of AGVIQ-CH2M HILL to comply with established standards concerning the health and safety of our employees and create work environments that are free of recognized hazards that may result in an accident, injury or illness. To do this, we must be vigilant in the identification and elimination of acts and conditions that can produce or lead to accidents, injuries, and illnesses in our workplace.

Knowledge of an unsafe act or condition does not make the work “safe”. When an act or work area condition is identified that is not consistent with the established practices of the AGVIQ-CH2M HILL Health and Safety Program (HSP), it is the inherent responsibility of each employee to report such inconsistencies to a supervisor so the act or condition may be evaluated, corrected, controlled, or engineered to a status that does not pose a significant threat. Where an act or condition in the workplace is determined to be Immediately Dangerous to Life and Health of AGVIQ-CH2M HILL employees, work must stop until the condition has been abated.

Management, supervisory, and worker personnel are all entrusted with implementing the policies and procedures of the AGVIQ-CH2M HILL HSP and prepared site specific health and safety documents. Prevention of accidents, injury, and illness is an achievable objective for all employees, at all responsibility levels, for all program operations. It is a basic requirement that each manager and supervisor make the safety of employees under their tenure an integral component of his or her regular management practices. Additionally, it is the duty of each employee to accept and follow established safety policies and procedures established by AGVIQ-CH2M HILL.

No employee shall be required to work at a location that would jeopardize their life or health. Employee cooperation in detecting, controlling, and reporting workplace hazards is a condition of participation in the AGVIQ-CH2M HILL Joint Venture Program. It is critical for AGVIQ-CH2M HILL personnel to immediately inform their supervisor of any situation or work area condition that is beyond their ability to correct or control. AGVIQ-CH2M HILL personnel will not be disciplined or suffer any retaliation for reporting acts or conditions that are not consistent with the policies and procedures required by the AGVIQ-CH2M HILL HSP or project specific health and safety documents.

Every effort should be made to provide adequate training to our program participants; however, if an employee is ever in doubt about how to do a job or task safely, it is his or her duty to ask a qualified person for help. Fellow team members that need help should be assisted. Program participants are expected to assist management in accident prevention activities. Everyone is responsible for executing their assigned duties in a safe manner. Every incident (including a near-miss) that occurs in the workplace shall be reported to a first-line supervisor, as soon as possible. Under no circumstances, except in the instance of emergency medical care, should an employee leave the work site without reporting an

accident, injury, or illness that occurs in the workplace. When a workplace accident, injury, or illness occurs, everyone is affected. The success and longevity of our program is directly related to maintaining a healthy and safe working environment for everyone.

### **3.1 Purpose**

The purpose of this project APP in conjunction with the project specific or program health and safety documents, is to define the policies, procedures, and requirements that must be implemented for the AGVIQ-CH2M HILL Joint Venture projects and to establish the requirements, responsibilities and expectations for management, supervisors, employees, and subcontractors that may participate in the execution of the program projects. It is the intent of this APP to address applicable requirements set forth by 29 CFR 1910, 29 CFR 1926, EM 385 1-1, and AGVIQ-CH2M HILL policies and procedures incorporated by reference, herein.

### **3.2 Objectives**

The objective of the AGVIQ-CH2M HILL Joint Venture Program is to provide a place of employment free of all recognized hazards that are causing or will likely to death or serious physical harm to our employees. This objective can be facilitated by developing and administering an overall health and safety program, which establishes written policies and procedures to serve as vehicles through which the program requirements will be implemented.

### **3.3 Accident Goals for this Contract and Program**

The health and safety goal for this project and the overall goal for the AGVIQ-CH2M HILL program is to eliminate workplace accidents, gain worker acceptance through cooperation and training, and provide our clients with a responsible, well-trained, safety-oriented work force.

AGVIQ-CH2M HILL considers safety the highest priority during work at all project sites and its business offices and has established a goal of zero incidents. Projects will be conducted in a manner that minimizes the probability of near misses, injury, illness, and equipment/ property damage.

## 4.0 Responsibilities and Lines of Authorities

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The following listed AGVIQ-CH2M HILL key project and program personnel will have the authority to intervene and suspend work in the interest of ensuring adherence to Health and Safety policies and procedures defined by the APP and/or the AGVIQ-CH2M HILL Joint Venture SBRAC Program.

**AGVIQ-CH2M HILL SBRAC Program Manager**

Sidney Allison: (843) 242-8018/ (843) 813-2672 (cell)

**AGVIQ-CH2M HILL SBRAC Deputy Program Manager**

Sam Naik: (770) 604-9182 x54248 / (678) 860-9626 (cell)

**AGVIQ-CH2M HILL Project Manager (overall)**

Amy Twitty: (850) 232-0320 (cell)

**AGVIQ-CH2M HILL Joint Venture Program CIH**

Angelo Liberatore, CIH, CSP: (678) 530-4210/ (770) 335-2076 (cell)

**AGVIQ-CH2M HILL Joint Venture Project Superintendent/**

To be Determined

**AGVIQ-CH2M HILL Joint Venture Program SSHO**

To be Determined

**AGVIQ-CH2M HILL Joint Venture H&S Program Administrator(s)**

Josh Painter, CSP: (303) 993-9274 (cell)

Mark Orman, CSP, CHMM: (414) 847-0597/ (414) 712-4138 (cell)

## 4.1 Organization and Responsibility for Health and Safety

The safety and protection of employees, clients, and the community is the first priority. If an activity or condition at a location under control of AGVIQ-CH2M HILL is determined to be inconsistent with our health and safety policies and procedures, all efforts shall be made to correct the situation immediately or as soon as feasibly possible. At no time should any AGVIQ-CH2M HILL personnel perform or be allowed to perform duties in a work environment that is immediately dangerous to life and health (IDLH) or in an imminently dangerous situation. In these situations, the task will not proceed until the situation is corrected.

### 4.1.1 Program Manager

The AGVIQ-CH2M HILL Program Manager is the primary operational and safety official of AGVIQ-CH2M HILL and has overall responsibility for ensuring that AGVIQ-CH2M HILL program participants implement the established health and safety policies and procedures adopted by AGVIQ-CH2M HILL. The deputy program manager supports the execution of all operations required of the Program Manager.

### 4.1.2 Project Manager

The AGVIQ-CH2M HILL Project Manager is responsible for allocation and coordination of adequate resources (budget and staff) for project-specific implementation of the Health, Safety and Environment (HS&E) management process. The Project Manager has overall management responsibility for the project tasks identified herein and reports to Program Management on all matters and to the Program CIH on matters involving the health and safety of program participants, project incidents or other health and safety related matters. The Project Manager may explicitly delegate specific tasks to other staff, but retains ultimate responsibility for completion of the following in accordance with this APP or other established health and safety requirements. Designated project coordinators, technical leads, engineers and other administrative staff support the execution of all operations required of the Project Manager. In general, the Project Manager's responsibilities include but are not limited to the following:

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by:
  - Ensuring that the review and acceptance/rejection of subcontractor pre-qualification health and safety questionnaires and safety performance documents has been completed.
  - Ensuring that acceptable certificates of insurance, including AGVIQ-CH2M HILL as named additional insured, are secured as a condition of subcontract award.
  - Ensuring subcontractor HS&E submittals required by subcontract agreements are executed, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations.

- Ensure that subcontract agreements and subcontractor certificates of insurance, bond, contractor's license, training and medical monitoring records, and site-specific safety procedures in the project file are accessible to site personnel.
- Provide oversight of AGVIQ-CH2M HILL and subcontractor HS&E practices per the requirements of established safety documents (i.e., APP, SSHS and AHAs).
- Manage the site and interface with third parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care.
- Monitor project health and safety performance during site operations. Ensure that both the overall and job-specific HS&E goals are fully and consistently implemented.
- Report all accidents injuries, illness, property damage cases and near-miss incidents to the Program CIH and Program and Deputy Program Managers.

### 4.1.3 Certified Industrial Hygienist

The AGVIQ-CH2M HILL Program Certified Industrial Hygienist (CIH) meets the established qualification, training and experience criteria requirements and exhibits sufficient knowledge in health, safety and/or industrial hygiene matters to manage and oversee the AGVIQ-CH2M HILL health and safety program. The CIH acts as the responsible program officer (Health and Safety Manager) to review and approve all developed project specific APP's and provides consultation, recommendations or requirements with regard to project worker protection and exposure issues. The CIH may also be required to perform the project/program roles and responsibilities of the Health and Safety Program Administrator(s) HSPA, where required. The Program Certified Industrial Hygienist (CIH) responsibilities include, but are not limited to the following:

- Shall review and approve the project specific APP for field implementation.
- Also be available for consultation/direction with regard to project Industrial Hygiene and worker exposure matters, as may be required by the project team, SSHO or the AGVIQ-CH2M HILL Health and Safety Program Administrator(s)(HSPA) and review and approve any changes to the APP which alters established requirements for worker exposure or perimeter air monitoring or Personal Protective Equipment (PPE).
- Perform the same roles and responsibilities as the HSPA, where required.
- Coordinates with the Program Manager, Deputy Program Manager and the Project Manager (and HSPA or SSHO, as necessary) on all site or worker health and safety matters.

#### 4.1.4 Health and Safety Program Administrator(s)

The AGVIQ-CH2M HILL Health and Safety Program Administrators (HSPAs) administers the overall health and safety program for the AGVIQ-CH2M HILL program and reports directly to the Program Management and the Program CIH with regard to AGVIQ-CH2M HILL program or significant project health and safety matters. The HSPA provides the day to day implementation of the health and safety program on behalf of the Program CIH. The HSPA is responsible for supporting and assisting the AGVIQ-CH2M HILL program staff in executing the required health and safety policies and procedures adopted by the program, for implementation. The HSPA responsibilities include, but are not limited to the following:

- Develop and/or review the project APP for final approval by the CIH.
- Provide review and comment on subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA) and request corrective actions are made, where required.
- Provide review and comment subcontractor training records, site-specific safety procedures or subcontractor safety performance submittals prior to start of subcontractor's field operations and request corrective actions are made, where required.
- Support the SSHO's oversight of subcontractor (and lower-tier subcontractors) Health, Safety, and Environment (HS&E) practices and interfaces with third parties, as necessary.
- Support and assist program staff in executing the HS&E policies and procedures adopted by the program for implementation, including the program Behavior Based Loss Prevention System (BBLPS) and overall Risk Management Process (RMP). Provide consultation and direction to project staff with regard to HS&E project and program requirements and industrial hygiene practices.
- Support the amendment of approved APPs as may be necessary to be new work assigned contract functions or unanticipated site conditions. However, Adjustments to this APP to address or mitigate potential exposure to site constituents of concern (COCs) or involving modifications to worker PPE or worker/site exposure monitoring (air monitoring) requirements will require review and approval by the Program Certified Industrial Hygienist (CIH).

#### 4.1.5 Site Supervisors

Site supervisors are the critical links to the success of our injury and illness prevention and overall implementation of our Risk Management Process (RMP). For this project, the site supervisor reports to the AGVIQ-CH2M HILL overall Project Manager on all project matters. Site supervisor responsibilities include but are not limited to the following:

- Implementing the health and safety aspects of the AGVIQ-CH2M HILL program and ensuring that any onsite AGVIQ-CH2M HILL personnel adhere to the requirements of this (APP), host facility conditions or other applicably health and safety requirements relayed to project personnel as part of the execution of this project.

- Report all accidents injuries, illness, property damage cases and near-miss incidents to the Project Manager (overall).
- Conveying hazard information, to which they are advised of, to subordinate employees at the contract project site or facility locations.
- Investigating AGVIQ-CH2M HILL accidents, injuries and illness, that occur under their supervision at the contract project site, in accordance with the accident investigation procedures identified for the program.
- Coordinating the equipment and material needs to be procured by AGVIQ-CH2M HILL for the proper execution of the project.
- Promotes proper field communication and coordination with the overall project manager, field staff and client, as necessary, to personnel assigned to promote the proper execution of the project.
- Providing adequate pre-project planning to allow for the effective procurement of appropriate equipment, materials, safety related systems or documents to facilitate the execution of individual project tasks in a safe and efficient manner;
- Implementing the components of the AGVIQ-CH2M HILL Behavior Based Loss Prevention System (BBLPS) including the execution of routine pre-job safety overviews at AGVIQ-CH2M HILL contract project locations as the project begins, as new tasks are planned, as new project hazards are identified or when new project team members are assigned to the project site.
- Taking prompt action to correct identified acts or conditions which are personally observed by a supervisor or brought to the attention of a supervisor that are not consistent with the conditions of this APP or AGVIQ-CH2M HILL health and safety program requirements.
- Promoting and ensuring an appropriate project safety culture for subordinate site personnel by positive example.
- Stopping or correcting questionable acts or identified conditions that are under a supervisor's responsibility and which are inconsistent with established safety standards, AGVIQ-CH2M HILL policies and procedures and requirements established by this APP. The site supervisor shall also have the authority to take prompt corrective measures to eliminate existing and predictable hazards and stop work when required.
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including named additional insured), bond, contractor's license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor's field operations.
- Manage and interface with third parties in a manner consistent with our contract/ subcontract agreements and the applicable standard of reasonable care.

#### 4.1.6 Site Safety and Health Officer

The SSHO is responsible for verifying that the project is conducted in a safe and healthy manner and includes the following specific obligations:

- The SSHO shall have the onsite responsibility and authority to modify or stop work or remove personnel from the site, if working conditions change or may affect onsite or offsite health and safety. The SSHO shall have the authority to immediately stop work when an employee is deemed to be in imminent danger of serious injury or loss of life.
- The SSHO will remain onsite at all times when work is in progress unless properly relieved by a qualified and designated SSHO alternate.
- Report all accidents injuries, illness, property damage cases and near-miss incidents to the Site Supervisor and Program CIH.
- Verify this APP remains current and amended when project activities or conditions change.
- Coordinates with the Site Supervisor and the Project Manager (overall) on all site matters and reports to the Program CIH (or HSPA as an alternate) on all health and safety matters.
- Verify AGVIQ-CH2M HILL site personnel and subcontractor personnel read, or have been briefed on the contents of this APP and SSHSP, and sign Attachment 2, APP/SSHSP "Acknowledgement Form" prior to commencing field activities.
- Verify AGVIQ-CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 6.0 of this APP.
- Verify adherence with the requirements of this APP and where applicable the subcontractor's health and safety plan(s).
- Act as the project "Hazard Communication Coordinator". Deliver or provide hazard communication information to AGVIQ-CH2M HILL site personnel as may be necessary.
- Act as the project "Emergency Coordinator" and perform the responsibilities outlined in this APP or as maybe required to properly coordinate the onsite response of emergencies, as they arise.
- Verify that safety meetings are conducted at least daily or more frequently as project tasks or hazards change and documented for the project record in accordance with the requirements of the BBLPS.
- Verify that project H&S forms and permits, found in Attachment 4, are being used as intended.
- Verify that Project Activity Self-Assessment Checklists, found in the CH2M HILL, Inc. SOPs referenced in this APP, are being used as intended.
- Verify that the Drug-Free Workplace Program is being implemented.

- Coordinate with the HSPA(s) or Program CIH regarding AGVIQ-CH2M HILL and subcontractor operational performance, and third-party interfaces.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The SSHO is responsible for coordinating with the AGVIQ-CH2M HILL individual responsible for site operations (i.e., Site Supervisor/Manager or Field Team Leader) and Project Manager, as necessary. In general, the Project Manager (overall) will contact the client in the event accidents, injuries or property damage occurs on the project site. The Program CIH (or HSPA(s) as necessary), should be contacted by the SSHO as appropriate.

#### 4.1.7 AGVIQ-CH2M HILL Program Participants

All AGVIQ-CH2M HILL Program participants (i.e., “employees”), regardless of job title, share the responsibility for executing their assigned tasks in a healthy and safe manner and must report any or acts or conditions that are not consistent with established health and safety procedures and protocols at the project site without fear of reprisal. It is imperative that AGVIQ-CH2M HILL Program participants observe the following minimum requirements in order to achieve a safe and healthy workplace:

- Program participants must familiarize themselves with the contents this APP and the general safety rules herein.
- Program participants must implement all health and safety requirements delivered or provided to them.
- Program participants shall wear the necessary PPE required for the job or task as specified by the APP or other applicable program requirements.
- Program participants must notify their immediate supervisor of any potential workplace hazard, condition, work practice or act that is not consistent with the AGVIQ-CH2M HILL health and safety policies and procedures.
- Program participants must report all accidents, injury, illness or property damage to an immediate supervisor regardless of the severity or cost. This includes all near misses (accidents without injury or damage).
- Program participants shall adhere to the requirements of their employer Drug Free Work Place Program. In addition, each program participant that is taking any prescription or over the counter medications that could alter the manner in which they could be treated in an emergency or effect their job performance/safety or other site personnel shall notify their supervisor of the condition prior to beginning any assigned work.
- Program participants shall be subject to the requirements of their employer’s policies and procedures for disciplinary action where it is determined that health and safety requirements are not followed or disregarded.

## 4.2 Employee Competency

Employee competency, as defined by 29 CFR 1926.32(f) and for areas of executable contract work for which an employee has responsibility, shall be established by the appropriate employer only (i.e., AGVIQ, LLC. or CH2M HILL, Inc.). Employee competency is determined by employee training, total work experience and/or on the job training, professional certification and/or educational degrees.

It is the opinion of AGVIQ-CH2M HILL that the professionals identified in this APP are competent in their areas of expertise with regard to the management, field execution of the specified contract work, or in the implementation of AGVIQ-CH2M HILL site specific or program health and safety requirements, as applicable.

In addition to the above, the AGVIQ-CH2M HILL Health and Safety Program utilizes a team of Health and Safety Professionals who are qualified by experience, training, educational degrees and professional certification (CIH, CSP, CHST, ASP) to act as the responsible program representatives with regard to the overall project specific and program wide implementation of the AGVIQ-CH2M HILL Health and Safety policies and procedures.

### 4.2.1 Presence of Competent Person On-Site

Executable onsite contract work for which there is a specific requirement for a competent person to oversee (i.e., excavation, scaffolding etc.), will not be conducted unless a competent person is available and present on the job site.

There are no identified DFOV that have a requirement for competent person during the execution of this project.

## 4.3 Requirements for Pre-task Safety and Health Analysis

Requirements for completing Pre-Task Safety and Health Analysis prior to the execution of onsite work must be, at a minimum, in accordance with sections 10.2 Pre-task Safety plans and Section 10.1 Activity Hazard Analysis of this APP. Activity Hazard Analysis (AHA) documents applicable to this project are included in Section 10.6, project Specific Activity hazard Analyses of this APP.

## 4.4 Lines of Authority

Safety responsibilities, accountability, and lines of authority for this project are as identified in Sections 4.1 through 4.2 of this APP and is as graphically represented in Figure 4-1, below.

FIGURE 4-1

**AGVIQ-CH2M HILL JV III (SBRAC)  
Incident Notification Process and Chain of Command**

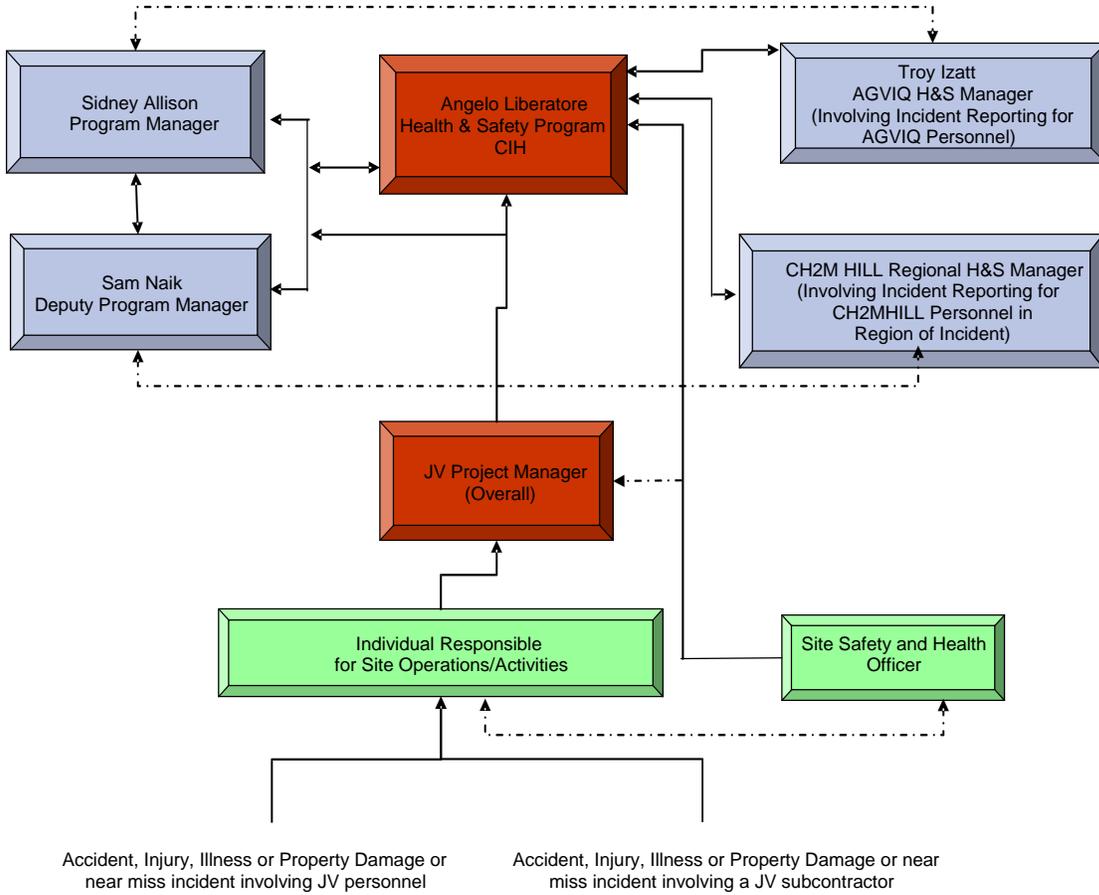


**1 Bold lines represent AGVIQ-CH2MHILL Primary Lines of Authority for this project.**

**2** Where the Program CIH is not immediately available for incident reporting contact a designated AGVIQ-CH2MHILL HSPA.

1 Bold lines represent AGVIQ-CH2MHILL Primary Lines of Authority for this project.

2 Where the Program CIH is not immediately available for incident reporting contact a designated AGVIQ-CH2MHILL HSPA.



## 4.5 Non Compliance with Safety Requirements

The duty for employee disciplinary action must be exercised by the employee's company line manager, supervisor, or corporate official only, as appropriate. Verbal or written reprimands, suspensions, or terminations shall be in accordance with the requirements established by the AGVIQ, LLC or CH2M HILL, Inc. employee's Corporate Employee Handbook, or internal policies and procedures and Standard Operating Procedures (SOPs). The content of these documents applies to employees of the specific employer and its authorized subsidiaries.

To ensure seamless project operations and the best possible work environment for AGVIQ-CH2M HILL program participants, both AGVIQ, LLC and CH2M HILL, Inc. in its business partnership (AGVIQ-CH2M HILL Joint Venture), expects its employees to follow rules of conduct that and established site procedures that will protect the health and safety of all AGVIQ-CH2M HILL personnel.

Where unacceptable employee behavior or workplace actions are identified, it is will be the intent of the employer to administer equitable and consistent disciplinary actions. It is in the best interest of AGVIQ, LLC and CH2M HILL, Inc. to ensure fair treatment of all employees by making certain that disciplinary actions are prompt, uniform, and impartial. The major purpose of any disciplinary action is to correct the problem, prevent recurrence, and prepare the employee for satisfactory service in the future.

Employee disciplinary actions are "typically" exercised in a three-step process;

- verbal warning,
- written warning,
- suspension with or without pay or up to termination of employment, depending on the severity of the problem and re-occurrences of similar unacceptable employee behavior or workplace actions.

By using progressive discipline, most employee problems can be corrected at an early stage, benefiting both the employee, AGVIQ, LLC, CH2M HILL, Inc. and the AGVIQ-CH2M HILL Joint Venture Program.

Both AGVIQ, LLC and CH2M HILL, Inc. recognize that there are certain types of employee problems that are serious enough to justify either a suspension, or, in extreme situations, termination of employment, without going through the usual progressive discipline steps, but this decision shall be solely determined by the employee's respective employer and not the AGVIQ-CH2M HILL Joint Venture.

## 4.6 Procedures for Holding Managers and Supervisors Accountable for Safety

It is the duty of first managers and supervisors to motivate employees and promote the adherence of AGVIQ-CH2M HILL's established health and safety policy and procedures and established hazard control measures identified for each work environment under their supervision.

When in doubt, they should seek the assistance of the Program CIH or designated HSPA, or other authorized program level representative, prior to initiating a task. If the task cannot be accomplished in a manner that is consistent with established AGVIQ-CH2M HILL program, regulatory or contract health and safety requirements, it will not be attempted.

Managers and supervisors must:

- Confirm subcontractor safety performance records/information and pre-mobilization contractual obligations (insurance, bonding, work plans, training documentation etc.) have been met prior to initiating onsite work.
- Allocate sufficient time for the training/orientation of AGVIQ-CH2M HILL personnel to ensure that everyone knows the appropriate requirements (health, safety procedural) for completing assigned tasks.
- Ensure that the AGVIQ-CH2M HILL program participants are outfitted with and wear PPE as specified by this APP other AGVIQ-CH2M HILL procedures, or as directed by the Program CIH, HSPA, Project Manager, or SSHO.
- Prevent new site personnel from performing any tasks until required training/orientation is completed.
- Verify program participants and subcontract personnel are completing assigned tasks in a manner that is consistent with established health and safety policies and as instructed.
- Immediately correct acts or conditions that are not consistent with AGVIQ-CH2M HILL Joint Venture policies and procedures, or OSHA and EM 385 1-1 requirements.
- Lead by setting a “good example.”
- Promote the creation of a healthy and safe work environment for site personnel in which program participants and subcontractors support the achievement of our safety goals.
- Monitor subcontractor performance during operations to ensure contractual requirements are met.
- Report all accidents, near misses, and property damage in accordance with the Incident Management and Reporting Procedure.

Section 4.7, 4g. Non Compliance with Safety Requirements of this APP identifies the procedures holding managers and supervisors and all other program participants accountable regarding non-compliance of safety requirements.

## 5.0 Subcontractors and Suppliers

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### 5.1 Identification of Subcontractors and Suppliers (if known)

All subcontractors who may be required to support the execution of this TO are either not identified or have not been issued a subcontract award at time this APP has been prepared for submission, and therefore cannot be included, herein at this time. Because of the potentially dynamic and evolving nature of contract requirements and resultant project scheduling at many points during the project evolution, only partial identification of potential subcontractors who may support this TO is available. To this end, continuously updating and amending this APP with potentially identified or newly selected subcontractors would not be practical or cost effective for all parties concerned. If, prior to the start of this TO, the Government Designated Authority (GDA) requires a list of awarded subcontractor entity information, then such information shall be prepared and provided by the AGVIQ-CH2M HILL project manager (overall) identified in this APP.

The AGVIQ-CH2M HILL procurement/contracting team maintains an extensive and detailed process for subcontractor procurement with the Federal Acquisition Regulations (FAR) as the primary driver. Subcontractor selection is based on scope of work pricing, qualifications, current and historical safety performance data and best value evaluations.

### 5.2 Safety Responsibilities of Subcontractor/Supplier

AGVIQ-CH2M HILL subcontractor safety performance and adherence to established industry standards and project policies and procedures will be reviewed prior to being issued a contract for Site work. AGVIQ-CH2M HILL subcontractors must be required to comply with the most stringent requirement defined by the Subcontractor's own policies and procedures, or requirements outlined in this APP, regulations or other requirements applicable to a project, such as contract flow-down requirements.

Typically, the subcontractor reports directly to the AGVIQ-CH2M HILL Project Manager. The AGVIQ-CH2M HILL Project Manager will typically designate daily subcontractor onsite reporting requirements to the AGVIQ-CH2M HILL site supervisor (i.e., Superintendent, foreperson, Field Team Leader or other appropriate designee).

AGVIQ-CH2M HILL subcontractors may be required to acknowledge and adhere to the requirements of the AGVIQ-CH2M HILL APP. Where subcontractor personnel are covered by this APP, they must be provided a copy of it to read or be provided a detailed briefing of its contents, and acknowledge the conditions of this APP to initiating work by application of subcontractor employee signatures on the APP/SSHSP Acknowledgement Form (**Attachment 2**).

However, if the AGVIQ-CH2M HILL APP does not address specific hazards associated with specialty tasks and equipment that the subcontractor has expertise in (e.g., electrical, scaffold erection, demolition), a subcontractor must be required to develop or implement their own APP which is equally or more stringent than AGVIQ-CH2M HILL APP or prime contract documents.

All subcontractor personnel shall be subject to the same training (or medical surveillance requirement, where applicable) as AGVIQ-CH2M HILL personnel, depending on job activity and OSHA requirements.

All subcontractor personnel actively engaged in onsite operations should be required to sign in daily at AGVIQ-CH2M HILL controlled project sites (**Attachment 4**) and either attend an AGVIQ-CH2M HILL sponsored daily safety meeting and work phase meeting (or be required to conduct their own) which addresses daily operations, site specific hazard awareness, or other pertinent issues associated with the scheduled work or complete their own meeting of similar intent. The requirements for implementing and documenting daily or periodic work phase meetings are detailed in Section 10.0, Risk Management Process (RMP), of this APP and will not be further elaborated upon in this section.

All incidents involving subcontractor personnel must be reported to the AGVIQ-CH2M HILL site supervisor and a copy of the subcontractor's incident or injury/illness report will be submitted to the AGVIQ-CH2M HILL site supervisor, Project Manager, program Manager and Program CIH as soon as possible, but no later than 24 hours.

Subcontractors are responsible for the health and safety procedures specific to the work, but it is critical that subcontractor work be performed in a manner that is consistent with applicable OSHA standards (29CFR1910, 29CFR1926, as applicable), EM 385 1-1 or other applicable health and safety plan(s)/protocols. Identified subcontractor health and safety performance or site conditions that are not consistent with established procedures must be corrected.

AGVIQ-CH2M HILL continuously endeavors to observe a subcontractors' safety performance. This process should be reasonable and include observing site hazards, practices and procedures that are not consistent with established HS& E requirements that are both readily observable and occur in common work areas. However, observance of subcontractor operations by AGVIQ-CH2M HILL does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s), protocols, or established safety regulations or contract conditions.

When apparent conditions or actions are observed that are not consistent with this APP, AGVIQ-CH2M HILL Health and Safety Program protocols or project/regulatory requirements, the designated subcontractor onsite supervisor or safety representative shall be notified of the condition so that the subcontractor can determine and implement the appropriate corrective action(s). When these identified conditions or practices/actions are repeated or persist, notify the designated subcontractor onsite supervisor or safety representative and require the condition be immediately corrected. Contact the Project Manager and evaluate the need to issue a stop work order (SWO) (**Attachment 4**) affected work until adequate corrective measures are implemented.

When an apparent imminent danger exists, immediately remove all affected AGVIQ-CH2M HILL and subcontractor personnel, notify onsite supervisor or safety representative and stop affected work until adequate corrective measures are implemented and also issue the SWO. Notify the Project Manager (overall) and Program CIH (or HSPA if necessary), as appropriate. Document all standard and imminent danger SWO related communications in project field logbook, daily reports, or other records.

# 6.0 Training

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## 6.1 New Hire SOH Orientation Training

The overall Safety and Occupational Health (SOH) orientation provided by AGVIQ, LLC and CH2M HILL, Inc. for their employees, incorporates the information necessary for the employee to perform as expected but also considers assigned job function, experience of the employee, personnel certifications and education level/degrees achieved by the employee completed as related to the employees assigned job function.

Because the AGVIQ-CH2M HILL Joint Venture is composed of two separate and distinct corporations operating together in a business partner arrangement, both corporations separately conduct new hire safety and occupational health (SOH) orientation training in accordance with each employer's (AGVIQ, LLC or CH2M HILL) established processes. Typically such orientations would be performed by an employee's line supervisor, human resource representative, intranet training or by employee review of information provided by the employer. In general, new hire SOH orientation training would most likely include the following components, depending on the employee's hire category.

- 1) Completion of hire evaluation new any employer specific Drug Free Work Place (DFWP) requirements
- 2) Introduction to company/corporate history
- 3) Organizational Structure
- 4) Briefing on job functions and employee performance expectations
- 5) Time keeping and/or expense reporting
- 6) Provision, review and acknowledgement of Corporate Policies and Procedures Manual (aka Employee Manual) or equivalent
- 7) Provision, review and acknowledgement of Corporate Health and Safety Program Plan or equivalent
- 8) Verification and update (as necessary) of prerequisite training and medical surveillance testing, where applicable for field work (Hazwoper/Construction)
- 9) Management and Supervisor training, as applicable

In order to promote the seamless operation of the AGVIQ-CH2M HILL Joint Venture program as a single entity, orientation to management and supervisory personnel who have not previously participated in the AGVIQ-CH2M HILL programs is provided. This orientation typically would include, but not be limited to the following:

- 1) Background history of the development and functionality of the AGVIQ-CH2M HILL Joint Venture Programs
- 2) Organizational Structure

- 3) Project and Program reporting requirements (incident, financial and chain of command)
- 4) Fund allocation, cost tracking, forecasting and invoicing procedures
- 5) Review processes for Client Request For Proposal (RFP) responses and project deliverables
- 6) Project concurrence or changed conditioned processes
- 7) Expectations with regard to Client/Customer and project team communications, project performance, Client/Customer expectations, health and safety and quality control performance
- 8) Resource allocation

All designated AGVIQ-CH2M HILL personnel, regardless of assignment responsibilities, who are engaged in site operations must review or be provided a detailed briefing on the contents of site specific health and plans, APP's, task specific Activity Hazard Analyses (AHAs) and daily safety briefings and must acknowledge such documents by signature.

## 6.2 Requirements for Mandatory Training and Certificates

AGVIQ-CH2M HILL engages in construction, environmental remediation and other consulting services and endeavors to comply with the health and safety training requirements mandated by governmental agencies, internal policies and client requirements.

Personnel will be provided sufficient training to execute their jobs in a safe and healthy manner. It is the responsibility of each employer (AGVIQ, LLC and CH2M HILL, Inc.) to ensure that their employees maintain the appropriate training requirements to complete their assigned duties. Direct employee supervisors, with support by the respective employer Senior Management and Health and Safety professionals, are responsible for determining the overall and project specific training requirements to ensure that personnel assigned to AGVIQ-CH2M HILL operations have the necessary requisite.

Designated employer personnel and electronic databases facilitate the maintenance of training records and applicable experience documentation. When an employee training is identified being insufficient to perform an assigned task, every effort will be made to provide the necessary training or to provide a trained and experienced alternate until the employee has achieved the required criteria.

Employee training records are available at corporate offices, by electronic means, and generally maintained on the project site. Depending on the size of the project crew and because of work crew dynamics and scheduling, the provision of hard copy employee training records (and medical surveillance records where applicable) for all anticipated personnel who may be assigned to this project, within the content of this APP is impractical. AGVIQ-CH2M HILL endeavors to maintain these documents onsite for review and will provide them to government officials for verification, upon request.

All AGVIQ-CH2M HILL personnel performing Hazardous Waste Operations and Emergency Response (HAZWOPER) Regulated Tasks are enrolled in a comprehensive health and safety program, which at a minimum, meets the requirements of 29CFR1910.120/29CFR1926.65 or 29CFR1910.134. The medical surveillance and training requirements associated with this project are summarized below.

Training or Medical Surveillance Requirement	Applicability
Initial HAZWOPER 29 CFR1910.120(e)(3)/29 CFR1926.65(e)(3) Note: 40-hour or 24-hour training as applicable to employee assigned duties. No periodic refresher performance so long as the requirements of 29 CFR1910.120(e)(8)/29 CFR1926.65(e)(8) are maintained.	All site personnel performing Hazwoper regulated activities identified in Section 2.4 of this APP.
8 hour HAZWOPER refresher 29 CFR1910.120(e)(8)/29 CFR1926.65(e)(8) on an annual basis	All site personnel performing Hazwoper regulated activities identified in Section 2.4 of this APP.
HAZWOPER Supervisor 29 CFR1910.120(e)(4)/29 CFR1926.65(e)(4) with no specific recertification requirements.	All site manager, supervisory or SSHO personnel performing Hazwoper regulated activities identified in Section 2.4 of this APP.
First Aid/CPR/AED/Blood Borne Pathogens 1st Aid – typically 3-year renewal CPR – 1- or 2-year renewal (depending on sponsor)	All designated manager, supervisory or SSHO site personnel (2 per site).
OSHA 10-hour Construction Safety Training	SSHO
Excavation Competent Person	Site Supervisor or delegated person
HAZWOPER Medical Clearance 29 CFR1910.120(f)/29 CFR1926.65(f) on an annual basis under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine	All site personnel performing Hazwoper regulated activities identified in Section 2.4 of this APP.
Respirator Clearance 29 CFR1910.134(e) on an annual basis under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine	All site personnel performing Hazwoper regulated activities identified in Section 2.4 of this APP and required to utilize respiratory protection
Hazardous Waste Transport 49CFR172.700 Renewal, every 3 years	Each person who offers for transportation in commerce or transports in commerce hazardous materials

It is our intent to require site personnel designated with management, Site Supervisor, or SSHO responsibilities to maintain current American Red Cross or American Heart Association sponsored First Aid and Cardio-Pulmonary Resuscitation (FA-CPR/AED/Blood Borne Pathogens) certifications. When a medical facility or physician is not accessible within 5 minutes of an injury to a group of two or more employees for treatment of injuries, at least two employees on each shift shall be trained to administer First Aid and CPR including AED. These individuals have also been provided training in exercising universal precautions against exposure to bloodborne pathogens as a component to FA/CPR training which meets the intent of 29 CFR1910.1030. This employee training is also regularly complemented by other regularly scheduled employer training curriculums that

are typically executed for the HAZWOPER industry, regulated under 29 CFR1910.120/29 CFR1926.26.

Site orientation training shall be described and carried out, to include at a minimum the elements below. This site-specific training will be documented in writing by date, name, content, and trainer and kept on file at the job site.

1. The content of the APP and SSHP
2. Potential site hazards (chemical, physical, and biological) and the means to control or eliminate them, including applicable AHAs
3. Selection, use, and limitations of required PPE
4. Emergency response procedures including emergency medical protocols
5. Bloodborne pathogen (BBP) briefing
6. Employee and supervisor responsibilities for reporting all accidents
7. Requirements and responsibilities for accident prevention and the maintenance of a safe and healthful work environment
8. Procedures for reporting and correcting unsafe conditions and practices
9. General safety and health policies and procedures

### **6.3 Procedures for Periodic Safety & Health Training of Supervisors and Employees**

Supervisor and employee training is routinely provided by the employee's employer (AGVIQ, LLC. or CH2M HILL, Inc.) as method of adhering to OSHA, DOT or other requirements. The types and frequency of routine training provided to AGVIQ-CH2M HILL program participants by AGVIQ, LLC. or CH2M HILL, Inc. is identified in Section 6.2 of this APP.

Supervisor and employee training is regularly supplemented through the regular implementation of AHA and daily safety meeting processes, which are detailed in Section 10.0 Risk Management Process of this APP. Implementation of AHAs and daily safety meetings as a regular component to our RMP provides a routine procedure for conducting additional supervisor and employee "awareness training." The desired result of the implementation of the RMP is to facilitate the identification and control of certain risks (or liabilities) that may be encountered during the execution of the project. Additionally, the implementation of our RMP processes establishes and maintains a level of expectation with regard to overall project and program health and safety performance.

### **6.4 Requirements for Emergency Response Training**

There are no specific requirements for emergency response training for this project other than the following:

- 29 CFR 1910.120(e)(3)/29CFR1926.65(e)(3) standard

- On the job experience associated with operations regulated by 29 CFR 1910.120(e)(3)/29CFR1926.65(e)(3) standard First Aid and CPR training and Blood Bourne pathogen training

## 7.0 Safety and Health Inspections

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The AGVIQ-CH2M HILL site supervisor or SSHO are required to perform site inspections using the checklists/forms included herein Attachment 4 of this APP or contained in the CH2M HILL, Inc. SOPs referenced herein. The forms included in Attachment 4, herein, are not intended to be an all-inclusive detail of inspection forms/checklists which may be needed during the execution of this project, but is intended to represent a submittal basis only. Other applicable forms or checklists are contained in CH2M HILL Standards of Practice (SOP), referenced through Section 9.0 of this APP, which are available in electronic format for AGVIQ-CH2M HILL program participants.

Site inspections/evaluations will be made by the site supervisor, SSHO or other designated AGVIQ-CH2M HILL representative, depending on assigned job function. Discrepancies or HS&E inconsistencies identified during inspection and evaluation process will be corrected as soon as practicable and documented on the Loss Prevention Observation (LPO) form and/or Deficiency Tracking System form included in Attachment 9 of this APP. Serious inconsistencies that represent potential immediate harm or danger to an employee will be corrected immediately or controlled to a condition where it does not represent a threat to the employee. Inspections that identify Imminent Danger or Immediately Dangerous to Life and Health (IDLH) situations will require that work be immediately stopped and personnel removed from the work area until the situation is abated, corrected, or controlled to a non-hazardous condition.

The site supervisor or SSHO (when designated by the Project Manager or site supervisor) is responsible for conducting and preparing reports of inspections of work processes, site conditions and maintaining these documents for the project record, as necessary. Corrective actions resulting from discrepancies identified during inspections will be reviewed with the Project Manager and implemented, as necessary. Copies of these reports are maintained on file at the project locations.

A member of AGVIQ-CH2M HILL senior management or their designated representative may periodically conduct site visits and perform additional assessments of project health and safety performance, at their own discretion or at the request of a corporate official employee, site supervisor or manager. Any discrepancies identified as part of these inspection processes will be addressed with the Project Manager by the senior management team and may be corrected in the field if minor in nature.

The following is a typical list of the type and frequency of inspections that may be associated with this project and what individuals should perform such inspections.

<b>Inspection Type</b>	<b>Designated Person</b>	<b>Frequency</b>
Loss Prevention Observation	Any site personnel, but typically the Site Supervisor, SSHO or QCM	Weekly
Deficiency Tracking Log (includes general site inspection)	Any site personnel, but typically the Site Supervisor, SSHO or QCM	Entered Daily
Fire Extinguishers	Any site personnel, but typically the Site Supervisor, SSHO or QCM	Once Monthly Once Annually
Earthwork Equipment	Trained and qualified operator	Daily
Biofilter System	Trained and qualified operator	Daily
First Aid Kits	Any site personnel, but typically the Site Supervisor, SSHO or QCM	Before onsite use and at least every 3 months or more frequently depending on use
Hand and Power Tools	Individual using tool	Before Use
Electric Cords and GFCI's	Individual using electric cord and GFCI	Before Use

## 7.1 External Inspections/Certifications

The following is a list of potential external inspections that may be or will be required by NAVFAC.

- Issuance of Navy Intrusive Work Permit by the facility representative, as necessary.

# 8.0 Accident Reporting and Investigation

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## 8.1 Exposure Data (man-hours worked)

Because the AGVIQ-CH2M HILL Joint Venture is composed of two separate and distinct corporations operating together in a business partner arrangement, both corporations separately record and report information related to annual labor hours and workplace injuries and illnesses as required by 29 CFR 1904. Where annual summary postings are required under 29 CFR 1904.32(b)(6), they will be posted as separate documents by AGVIQ, LLC, and by CH2M HILL, Inc., in our appropriate workplace environment(s). In addition, because AGVIQ-CH2M HILL operates as a business partnership and not as a single business entity, AGVIQ-CH2M HILL does not maintain a jointly established Experience Modification Rate.

However, designated employee representatives from the AGVIQ-CH2M HILL Joint Venture programs tabulate and track labor hours posted to the AGVIQ-CH2M HILL program and lost work day and recordable incident information attributable to the execution of all AGVIQ-CH2M HILL Joint Venture program contracts and issued contract task orders. This process is executed for the purpose of establishing a safety performance history associated for our business partnership. AGVIQ-CH2M HILL safety performance data is extrapolated from the following:

- Tabulated Employer Labor Hours
- Established Incident Reporting Processes
- Incident Investigation Reports
- Formal Project Audits

To date, the AGVIQ-CH2M HILL Joint Venture programs has expended over 920,000 labor hours since 2003. Last year the Joint Venture worked 11,444 hours with one OSHA recordable cases, and zero (0) fatalities.

No DART cases or other recordable cases have been experienced for AGVIQ, LLC or CH2M HILL, Inc. employees participating in the AGVIQ-CH2M HILL Joint Venture since 2008.

For the Construction (North American Industry Classification System [NAICS] code -23) and Remediation Services (NAICS code - 56291) industries, which is typical of the contract work that AGVIQ-CH2M HILL typically executes, the AGVIQ-CH2M HILL calculated DART and OSHA Recordable Incident Rates for our entire operating period, are currently well below DART Incident Rate (IR) and OSHA Recordable Incident Rate tabulated by the 2008 United States Bureau of Labor Statistics (USBLS) for these industries (see below).

- USBLS IR Construction Benchmark (2009): 4.2 <sup>1</sup>
- USBLS DART Construction Benchmark (2009): 2.3 <sup>1,2</sup>
- USBLS IR Remediation Services Benchmark (2009): 3.2 <sup>3</sup>
- USBLS DART Remediation Services (NAICS Code 56291) Benchmark (2009): 1.5 <sup>2,3</sup>

<sup>1</sup> NAICS Code 23

<sup>2</sup> DART total "all sizes"

<sup>3</sup> NAICS Code 56291

## 8.2 Accident Investigations, Reports and Logs

Completion of incident and near-miss incident investigation reports for the AGVIQ-CH2M HILL Joint Venture shall be performed using the forms in **Attachment 10** and using the procedures in this section. The AGVIQ-CH2M HILL Program CIH, HSPA, or their designee (SSHO, Site Supervisor, Project Manager), conducts accident/incident investigations and prepares the required incident or near-miss incident investigation reports for the following conditions:

- Near Miss Incidents
- DART or other OSHA recordable cases
- Spills, releases, discharges, or environmental violations
- Property damage incidents resulting in over \$1,000 of loss
- A fatal injury \*
- A hospitalization of three or more people resulting from a single occurrence \*
- A weight-handling equipment incident
- A permanent total disability
- A permanent partial disability

\* Within 8 hours after the death of any employee from a work-related incident or the in-patient hospitalization of three or more employees as a result of a work-related incident, you must orally report the fatality/multiple hospitalization by telephone or in person to the Area Office of the Occupational Safety and Health Administration, U.S. Department of Labor, that is nearest to the site of the incident. You may also use the OSHA toll-free central telephone number, 1-800-321-OSHA (1-800-321-6742).

Completed incident and near miss incident investigation reports are reviewed by the CIH/HSPA, Project Manager (overall), site management (SSHO, Site Supervisor) team and Program Management team. Incident and near-miss incident reports must be submitted to the Project Manager, Program CIH/HSPA, the Program Management team, and the NTR and RPM as soon as possible, but no longer than 24 hours. At a minimum the Project Manager and Program Management personnel, including the Program CIH must be verbally notified, immediately or in a case where emergency medical treatment is required, as soon as injured personnel have been transported to and received by a medical treatment facility.

In addition to the above, the Project Manager (or Site Supervisor when designated by the Project Manager or Program Management team) must also be responsible for reporting all injuries to the Navy as soon as reasonably possible but no later than 2 hours.

Where an incident has, or appears to have, any of the consequences listed below, these incidents shall be immediately reported to Navy NTR & RPM.

- An injury or illness that:
  - Involves an exposure to a hazardous substance above the PEL
  - Meets the OSHA recordable criteria
  - Results in permanent total or partial disability
  - Results in one or more worker hospitalizations

- Results in a worker fatality
- An injury or unexpected chemical exposure to a client or a member of the public
- Any material or weight-handling incident or near miss including overturned crane, collapsed boom, dropped load, or damage to crane or adjacent property
- Any property damage greater than \$20,000
- A fire, explosion or flash
- Safety-related events reported by an enforcing authority or client
- External regulatory inspections that result in findings or citations
- A spill or release resulting from contractor activities
- A permit exceedance
- Any event that could result in adverse public media interest

Except for rescue and emergency measures, the accident scene shall not be disturbed until it has been released by the investigating official. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. The Contractor shall assist and cooperate with personnel conducting investigations on behalf of the Navy.

In addition to the incident and near-miss incident investigation report forms contained in **Attachment 10** for all OSHA recordable accidents, property damage in excess of \$20,000 a Contractor Significant Incident Report (CSIR) must also be completed. The initial form is due within 4 hours of a serious accident. A CSIR form marked 'Follow-up' or 'Final' is required within 5 days.

#### **Process for Immediate Reporting to Navy**

1. The scene of any fatality, injury involving hospitalization, weight-handling incident, fire/explosion/flash or property damage exceeding \$20,000 will be secured from disturbance pending investigation and further instructions from the Navy and contractor's HSPA.
2. Contractor will make a verbal report to the NTR as soon as possible, or within 2 hours, with as much information as is available at that time.
3. NTR will complete the Heads-Up Initial Mishap Notification for internal Navy notification.
4. NTR will enter contractor data into the Contractor Information Reporting System (CIRS) module in Enterprise Safety Applications Management System (ESAMS) within 8 hours.
5. A hyperlink and password will be sent to the identified contractor point of contact (POC) with instructions for completing the Contractor Safety Incident Report (CSIR) via ESAMS.

6. Contractor POC will enter ESAMS using the hyperlink and password provided by the system automatic email. Contractor will then complete the CSIR within 5 days. The CSIR will be sent via email to the NTR for review of minimum requirements. Contractor will provide updates to CSIR as information becomes available.
7. NTR will review the CSIR for minimum notification content and resolve any issues or concerns.

### **8.2.1 Best Management Practices for Incident Investigation**

The causes of loss and near-loss incidents can be similar, so by identifying and correcting the causes of loss and near-loss incidents, future loss incidents may be prevented. When loss or near-loss incidents occur, identifying and correcting conditions or acts that create these incidents can be achieved by engaging the following processes:

1. Gathering all relevant facts, focusing on fact-finding, not fault-finding, while answering the "who, what, when, where, and how" questions.
2. Draw conclusions, putting facts together into a probable scenario.
3. Determine the incident root cause(s) and contributing factors of incidents. These are basic factors on why or how conditions or acts are created that result in incidents.
4. Develop and implement solutions, matching all identified root causes and contributing factors with solutions so that future conditions or acts that have attributed to incidents are eliminated in the future.
5. Communicate incident as a lesson learned to all project personnel.
6. File follow-up on implemented corrective action to confirm solution is appropriate.

The purpose of an incident investigation is to understand how the incident happened, analyze the root causes, and prevent recurrence by implementing corrective actions. To conduct an effective investigation, all information must be as detailed and comprehensive as possible. The investigation must be based on facts that clearly identify the sequence of events and the factors that contributed to the incident. The investigation team should not be involved with any punitive actions resulting from the investigation. Fairness and impartiality are essential. The following provides general Best Management Practice guidance in completing incident investigations.

1. An unbiased approach is necessary to obtain objective findings.
2. Visit the accident scene as soon as possible while the facts are fresh and before witnesses forget important details.
3. If possible, interview the injured worker at the scene of the accident and "talk" through re-enactment.
4. Conduct all interviews as privately as possible. Interview witnesses individually and separately. Talk with anyone who has knowledge of the accident/incident, even if he/she did not actually witness it. Only retrieve witness statement from individuals who actually observed the accident/incident. Document witness interviews.

5. Document details graphically. Use the IRF as well as sketches, diagrams, and photographs as needed. Take measurements where appropriate.
6. Focus on the causes and hazards leading to the accident/incident. Develop an analysis of what happened, how it happened and how it could have been prevented. Determine what caused the accident/incident itself, not just the injury.
7. Include a Corrective Action plan in every investigation. Describe how you will prevent such accidents in the future. Completion of the Root Cause Analysis may assist in the formulation of such plans.
8. Save any evidence if a third party or defective product contributed to the accident/incident. It should be critical to the recovery of claims costs.

# 9.0 Plans Required by the Safety Manual

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## 9.1 Layout Plans (04.A.01)

Site locus maps, layout plans, haul route maps, drawings, or sketches are included in the project Work Plan, for which this APP is an integral component of and need not duplicated in this section of this APP. Site locus maps, layout plans and drawings are identified in the project Work Plan as follows:

## 9.2 Emergency Response Plans (01.E)

### 9.2.1 Emergency Planning/Preparedness

**(Reference CH2M HILL SOP # HSE&Q 106, Emergency Planning)**

The site supervisor and/or SSHO performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with onsite parties, the NAVFAC POCs, and local emergency-service providers as appropriate. These pre-emergency planning activities include the following:

- Review any host facility emergency and contingency plans, where applicable, or determine how host facility emergency and contingency plans effect, or are implemented at the project site location.
- Determine what onsite communication equipment is necessary and available (e.g., two-way radio, air horn, nearest telephone, cell phones etc.).
- Verifying sufficient resources are available so that the “Buddy System” can be used for all assigned work.
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel. Posting of emergency contact information shall be posted in a commonly accessed area in clear view of the onsite workers.
- Review changed site conditions, onsite operations, and host facility/outside agency responders accessibility/availability in relation to emergency response conditions.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency (first aid kits/eye wash etc., equipment, supplies, and potable water).
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the components of the APP and emergency response procedures.

- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.

### 9.2.2 Emergency Equipment and Supplies

The site supervisor/SSHO shall verify the availability and readiness of emergency support equipment listed below.

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes) w/ annual maintenance and monthly inspection tags	Support Area
First aid kit/CPR Shield	Support Area or Field Vehicle
Eye wash	Support Area or Field Vehicle
Potable water	Support Area
Blood borne-pathogen kit	Support Area or Field Vehicle
Additional equipment (specify): Mobile phone and contact information	Support Area or Field Vehicle for site supervisor/site management and SSHO at a minimum
Spill Control/Clean-up Materials/Proper Spill Response PPE	Support Area/ AST fuel storage tank

### 9.2.3 Evacuation

The Site Supervisor/SSHO will direct the coordination of response to emergency or medical support situations. Response considerations include the following elements:

1. Evacuation routes and assembly areas will be specified at the commencement of field work. Evacuation route(s) and assembly area(s) will be designated by the site supervisor or SSHO before work begins and posted at the designated evacuation rally point or construction support facility.
2. Personnel shall be advised of the assembly and accounting process during emergency conditions, able to understand evacuation signals and know where final evacuation assembly areas are located. The site supervisor or SSHO will account for personnel assembly area(s).
3. Designation of a vehicle to be available to support emergency conditions or response actions.
4. Evaluation of existing and potential hazards that may be associated with any experienced emergency condition and mitigation measures necessary to control hazards so the response measures can be executed without additional danger.
5. Assessment of the situation and condition of any victims.

6. Determination of the resources needed for victim stabilization and transport and additional emergency support.
7. Enforcement of the Buddy System. No one will be permitted to perform a response to an emergency condition alone.
8. Removal of injured personnel from the area and/or control of the emergency condition.
9. Decontamination of injured parties will be accomplished after stabilization of their medical conditions, where necessary. Gross decontamination maybe required if their condition poses immediate threat to the victim's life. If decontamination may cause additional harm to an injured person, then alternate measures such as wrapping the injured person in material to prevent the spread of contamination during extrication and transport may be required. In this situation, emergency medical transport personnel and the receiving medical facility must be advised of potential contamination issues of injured personnel, as early as possible.

Evacuation signals for the project site are listed below.

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.
<b>(Verify signal does not coincide with evacuation signals for government personnel in close proximity to the site)</b>	
Severe Weather Warnings (radio, TV, internet)	Leave the region in accordance with the facility evacuation orders or directives from program/project management team

#### 9.2.4 Procedures and Tests (01.E.01)

It is the intention of the project team to verify that emergency response processes are in place and capable of being executed, prior to the start of field assignments. However, because of the secure nature of the facility, response to medical or fire emergencies will most likely be by installation personnel or even possibly by outside public responders with secured or escorted access. As such, it may be impractical and disruptive to the primary mission of these responders to perform "procedural response testing". In this case, the designated site supervisor or SSHO shall verify that emergency services are available for response, that contact information is appropriate, and that responders know how to access anticipated work areas.

#### 9.2.5 Spill Plans (01E.01, 06.A.02)

The initial response to any spill or discharge will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If for some reason a chemical spill is not contained within a dike or sump area, an area of isolation must be established around the spill. When any spill occurs, only those persons involved in overseeing or performing containment operations will be allowed within the designated hazard area and must maintain appropriate training and possess proper experience and PPE, to do so.

The onsite emergency coordinator will inform the proper agencies of all spills. A Project Emergency Contact List is provided in **Attachment 5** of this APP. For work at this site, it is the AGVIQ-CH2M HILL's understanding that chemicals or materials that could create a threat to the health or safety to the surrounding community in the event of a spill or release will not be brought onsite as part of our scheduled work.

Reporting of spills or releases of oil or hazardous materials to appropriate agencies and stakeholders (i.e., NAVFAC, U.S. Environmental Protection Agency, U.S. Coast Guard, State Department of Environmental Protection, etc.) must be performed when spilled or released quantities of oil or hazardous materials are in excess of established Reportable Quantities (RQs) for the material in questions.

In a spill or release response/containment, personnel shall take the following measures:

- Immediately warn any nearby workers and notify individual responsible for site operations.
- Assess the spill area to ensure that it is safe to respond.
- Evacuate area if spill presents an emergency.
- Provide notification to project stakeholders.
- Ensure all unnecessary persons are removed from the hazard area.
- Put on protective clothing and equipment.
- If a flammable material is involved, remove all ignition sources, and use only spark- and explosion-proof equipment for recovery of material.
- Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.
- Stop source of spill and establish site control for spill area.
- If wastes reach a storm sewer, dam the outfall by using sand, earth, sandbags, etc. Pump this material out into a temporary holding tank or drums as soon as possible.
- Place all small quantities of recovered liquid wastes (55 gallons or less) and contaminated soil into drums for incineration or removal to an approved disposal site.
- Apply appropriate spill control media (e.g., clay, sand, lime) to absorb discharged liquids.
- For large spills, establish diking around leading edge of spill using booms, sand, clay, or other appropriate material. If possible, use diaphragm pump to transfer discharged liquid to drums or holding tank. Follow proper ground and bonding procedures of

equipment during recovery efforts. Intrinsically safe equipment must be used in recovery operations.

- For small fires or chemical releases, actions to be taken include the following:
  1. Shut down operations and evacuate the immediate work area
  2. Notify appropriate response personnel
  3. Account for personnel at the designated assembly area(s)
  4. Assess the need for site evacuation, and evacuate the site as warranted

Instead of implementing a work-area evacuation, small fires or spills posing minimal safety or health hazards may be controlled by onsite personnel, assuming that personnel who respond to these emergencies are properly trained to do so and wearing appropriate PPE to protect themselves against hazards that may be associated with the response.

In addition to the above, AGVIQ-CH2M HILL will have project field staff that are trained in accordance with 29 CFR 1910.120, are enrolled in a medical surveillance program meeting the criteria of 29 CFR 1910.120(f) and have previous experience training to mitigate unanticipated small releases of materials that could occur on this project (i.e., Petroleum, Oil or Lubricants) and spill materials that will be readily available at the project site.

#### 9.2.5.1 Anticipated Hazardous Materials (06.A.02)

The following is a list of hazardous materials or chemicals that may be brought onsite and incorporated as part of the final completion of the work, generated during the execution of the decontamination work. These hazardous materials or chemicals may require spill prevention and countermeasure control processes to ensure sensitive environmental receptors are not adversely impacted in the event of a spill or release of these materials.

- Fuel & Grease

#### 9.2.5.2 Notification

In the event a spill occurs that requires notification, a project person shall follow the “AGVIQ-CH2M HILL Incident Notification Process and Lines of Authority” organizational chart identified in Section 4.4 of this APP.

In addition, the AGVIQ-CH2M HILL Project Manager shall make notification to the designated project NAVFAC Point of Contact (POC) and environmental compliance representative(s) or other designated NAVFAC personnel, such that additional appropriate community and/or federal/state agencies may be engaged and notified, as applicable. The AGVIQ-CH2M HILL overall Project Manager shall coordinate with the designated project NAVFAC POC for support with regard to adhering to local, state, or federal regulations for spill notification cleanup and closure requirements.

#### 9.2.6 Firefighting Plan (01.E.01, Section 19)

AGVIQ-CH2M HILL personnel ARE NOT considered Firefighting Organizations or Fire Brigades. Only “small/containable”, incipient stage fires that are containable by the use of first response fire protection equipment (i.e., 2.5- to 20-pound ABC fire extinguishers) may be controlled by AGVIQ-CH2M HILL personnel. All other response shall be considered firefighting measures and shall be conducted by facility provided or public agency firefighting teams.

All fire prevention measures and portable first response fire protection equipment shall be in accordance with the information identified in Section 9.7 Health and Safety Hazard Control Program – Fire Prevention, and Section 9.2 Emergency Response Plans of the APP, respectively.

### **9.2.7 Posting of Emergency Telephone Numbers (01.E.05)**

Emergency contact numbers appropriate to project operations are included in Attachment 5 of this APP and are referenced as the “Emergency Contact List”. For this project it is anticipated that a temporary project construction support trailer will be mobilized to and established at the project site. Posting of emergency contact information shall be posted in a commonly accessed area of the temporary construction trailer and in clear view of the onsite workers. This action shall be considered as meeting the intent of EM 385 1-1, 01.A.06 and 01.E.05.

### **9.2.8 Man Overboard / Abandon Ship (19.A.04)**

(Reserved)

Man overboard/abandon ship scenarios are not applicable to this TO.

### **9.2.9 Medical Support**

Location and direction to the local emergency medical support facility shall be posted in a commonly accessed area of the temporary construction trailer and in clear view of the onsite workers.

In addition, the project shall be outfitted with first aid kits of suitable size and quality (contents) to meet health and safety requirements for onsite first aid and CPR response. Personal protective devices shall be provided such that universal precautions against blood borne pathogens can be exercised while administering CPR or first aid. Eye wash stations, either portable or stationary, will be available.

Procedures for the decontamination and medical treatment of injured personnel are provided in Section 1.2.18 of Attachment 1 of this APP (Site Specific Safety and Health Plan).

An effective means of communication and to summon transportation of injured workers to medical treatment facilities must be evaluated and established prior to the start of field activities. Communication devices shall be tested in the area of use to assure functionality. When a medical facility or physician is not accessible within 5 minutes of an injury to a group of two or more employees for the treatment of injuries, at least two employees on each shift shall be qualified to administer first-aid and CPR.

Injuries and illnesses experienced by AGVIQ-CH2M HILL personnel must also be reported to the Project and Program Management team identified in Section 4.0 this APP and Human Resources contacts on the Emergency Contact List in Attachment 5 of the APP. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the designated employer medical consultant or seek the evaluation form any Emergency Medical Services (EMS) Support personnel, as applicable, who may respond to onsite emergencies.

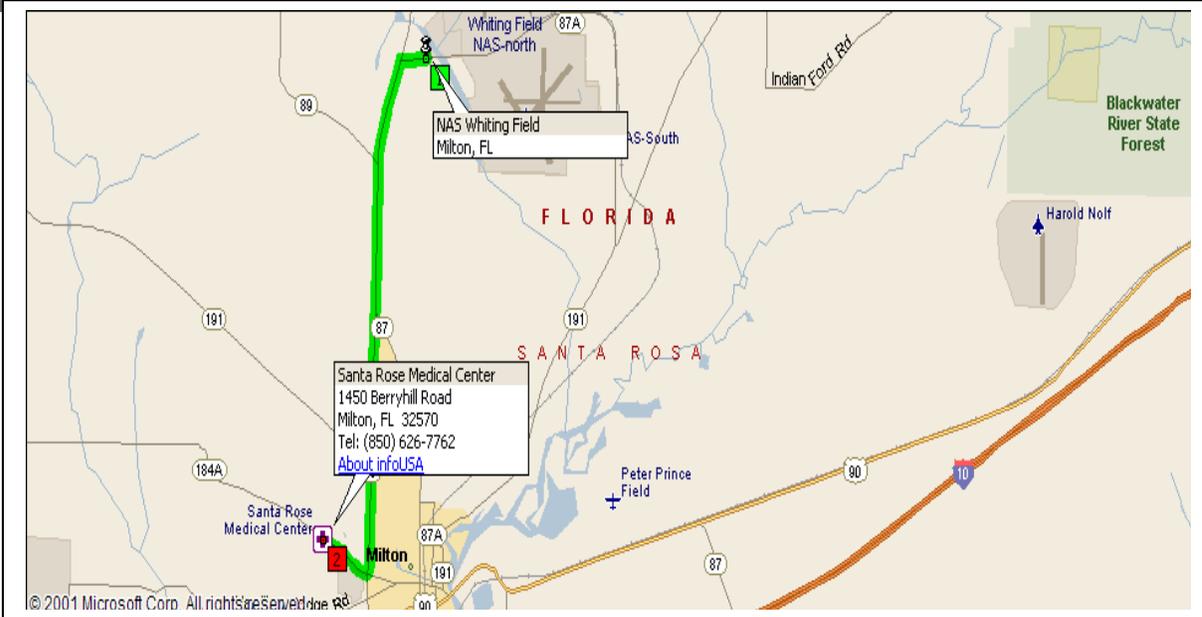
**It must be understood that for life threatening emergencies, get or summon medical attention immediately.**

During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities (e.g., 911).
- The Site Supervisor or SSHO will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible and where worker “Universal Precautions” to Blood borne Pathogens can be completed.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 8.0 and in accordance with the “Primary Lines of Authority identified in Section 4.4 of this APP.

A map showing the route to the local hospital is shown on Figure 9-1.

FIGURE 9-1 HOSPITAL ROUTE MAP



Directions	Distance
1) Depart NAS Whiting Field on SR-87A [Langley St] (West)	0.4 mi
2) Turn LEFT (South) onto SR-87	2.8 mi
3) Continue (South) on SR-89 [Dogwood Drive]	2.8 mi
4) Turn RIGHT (West) onto SR-184A [Berryhill Road]	0.8 mi
5) Arrive Santa Rose Medical Center	

**Santa Rose Medical Center**

1450 Berryhill Road  
 Milton, FL 32570  
 (850) 626-7762

**AGVIO-CH2MHILL Project – Emergency Contacts**

Sidney Allison – SBRAC Program Manager: Phone (843) 242-8018/ (843) 813-2672 (cell)  
 Sam Naik – SBRAC Deputy Program Manager: Phone (904) 777-4812 x 233/ (904) 219-6277 (cell)  
 Amy Twitty – Project Manager (overall): (850) 232-0320 (cell)

### 9.3 Plan for Prevention of Alcohol and Drug Abuse (01.C.02)

The AGVIQ-CH2M HILL policy statement on alcohol and drug abuse is provided in Section 10.5 of the APP, and will not be elaborated further upon in this section.

### 9.4 Site Sanitation Plan (2)

Toilet facilities for this project shall be of the pre-manufactured, temporary/portable type chemical toilets typical of construction projects and shall be constructed so the occupants are protected against weather and falling objects (reasonably sized); all cracks shall be sealed; and the door shall be tight-fitting, self-closing, and capable of being latched. Adequate ventilation (natural via vents) shall be provided and all windows and vents shall be screened. Toilet facilities shall be lighted via natural lighting. Provisions for routinely servicing and cleaning all toilets and disposing of the sewage shall be established before placing toilet facilities into operation. The method of sewage disposal shall be managed by the temporary/portable toilet vendor. Separate toilet rooms for each sex need not be provided if toilet rooms can only be occupied by one person at a time can be locked from the inside, and contain at least one toilet seat.

Washing facilities shall be provided within or adjacent to the temporary/portable type chemical toilet facilities and as needed to maintain healthful and sanitary conditions. If it is not practical to provide a water source for hand washing due to low ambient air temperatures (~32°F) running water, then hand sanitizers may be used as a substitute. Trash and garbage generated by the normal site operations must be properly stowed, containerized, and secured such that vermin will not be attracted and disposed of offsite on a regular basis.

Temporary sanitary facilities will be located adjacent to the construction support area trailer. The construction support trailer will contain necessary administrative support equipment, required to execute this TO.

### 9.5 Access and Haul Road Plan (4.B)

Site access and haul road details for the project site are identified in the Work Plan.

### 9.6 Respiratory Protection Plan (05.G)

**(References: CH2M HILL SOP # HSE&Q 121, Respiratory Protection, TIKIGAQ Corporation Respiratory Protection Program)**

(Reserved)

It is not anticipated that workers will be required to utilize respiratory protection during this TO to mitigate potential worker exposures to site COCs.

## 9.7 Health and Safety Hazard Control Program (06.A)

Exposure to certain project specific hazards in the work place may include injury/accidents, occupational illnesses or property damage due to execution of a variety of assigned tasks or as a result of existing site conditions. This section of the APP is provided to aid employees in the recognition of potential specific and general project hazards and provide procedures and practices to be implemented on the project site that may facilitate the reduction or elimination of occupational incidents that may be attributed to identified projects hazards. All AGVIQ-CH2M HILL personnel are required to contact the designated Project Manager, SSHO, Program CIH/HSPA identified in this APP regarding any questions or concerns to ensure the execution of this task order in a healthy and safe manner.

### 9.7.1 Adverse Weather

Sudden inclement weather can rapidly encroach upon field personnel. Because of the time of year that this project is being executed it is not anticipated that Hurricanes or tropical storms would have an impact or require a significant stoppage in scheduled tasks. However, because of the sites location its field crew members could experience a variety of adverse weather conditions during the course of a normal work assignment and should be prepared for the effects of adverse weather conditions.

Personnel performing work outdoors should carry clothing appropriate for foul weather conditions (rain gear, etc.) that may be expected. In severe weather conditions, (i.e., high wind, rain squalls, electrical storms), the field crews must evacuate from an outdoor work environment area and find safe shelter until the weather abates and until a decision is made to resume the field activities. Even though much of the field operations may be performed within sheltered environments, the following information is provided for field personnel subject to outdoor work environments as procedures must be exercised where adverse weather is encountered or is expected to occur during an assigned work day.

Frequently observe the skyline for rain squalls, thunder storms or other severe weather systems that may be developing. Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with the with home office support personnel who may be able to determine the severity of developing storm systems.

Shut down operations during heavy rain/lightning events, high wind or heavy snow conditions and identify "safe haven" location. Safe haven locations should be identified prior to the start of work. Safe haven structures must be grounded where there is a potential for a lightning event.

When excessively hot or cold ambient temperatures exist heat and cold stress monitoring must be implemented, as necessary, defined in Section 9.14 of this APP.

## 9.7.2 Lightning

Preparedness and caution are the best defenses against lightning. Many lightning deaths and injuries happen before or after a thunderstorm's peak. The site supervisor or SSHO shall monitor weather forecasts for predictions of electrical storms in the area. Lightning within 6 miles of the work site, all operations shall be stopped and only resumed when conditions permit. The site supervisor or SSHO shall monitor weather conditions to determine when it is appropriate to resume work. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap. Some other general precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.
- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers.
- Stay away from lakes, streams, pools, or any water.
- Stay away from railroad tracks that can carry lightning charges for long distances.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding. Do not stand on top of a hill.
- If you are caught in a level open area during an electrical storm and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of emergency.

## 9.7.3 Aerial Lifts

**(Reference CH2MHIILL SOP # HSE&Q-301, Aerial Lifts)**

(Reserved)

Aerial lifts will not be used on this project.

## 9.7.4 Air Compressor Operations

(Reserved)

Compressed air sources will not be used on this project. The requirements of EM 385 1-1, Section 26.I.01 are not applicable to the execution of this TO.

## 9.7.5 Asbestos

(Reference CH2MHIILL SOP # HSE&Q-502, Asbestos)

(Reserved)

Contact with Asbestos Containing Material (ACM) is not anticipated for this project. In the event that suspect PACM/ACM is discovered during site activities, personnel will secure/cover the material to the extent possible secure (i.e., in a manner that doesn't create a possible worker exposure) and exit the immediate work area until the nature of the material can be evaluated by qualified personnel. Personnel who do not possess proper qualifications and who are not enrolled in a medical surveillance program meeting the requirements of 29 CFR 1910.1001/29 CFR 1926.1101 will not disturb material that contains PACM/ACM.

## 9.7.6 Biological Hazards and Controls

The following sections provide information on potential biological hazards. Site personnel shall notify their overall supervisors and their project site supervisor of any potential allergic reactions that may occur as a result of contact with biological hazards in the workplace. If employee antidotes are required to counteract allergic reactions from biological hazard exposure, employees shall make personnel, who may be required to administer personal antidotes, aware of the location, type, and quantity of antidotes needed to counteract any potential allergic reaction(s).

### 9.7.6.1 Alligators

The habitat of the American Alligator includes coastal regions of much of the Southeastern United States. As such, personnel performing field activities must be aware of the potential to encounter alligators. The following safe work practices must be followed when accessing areas that can potentially be considered a viable alligator habitat.

- Always use the buddy system.
- With a buddy, survey the area for alligators or signs of alligators prior to entering areas that can be considered potential alligator habitats.
- Maintain radio and cellular phone communications with other team members.
- Avoid approaching the edge of the creek which could potentially be within striking distance of a submerged alligator.
- If an alligator is observed in the work area or signs of alligator presence is observed (tracks, nests, eggs) evacuate the work area immediately.
- Notify the project supervisor /project manager if alligators or signs of an alligator habitat are observed.



### 9.7.6.2 Venomous Snakes

Snakes typically are found in underbrush, tall grassy areas, near cover such as fallen logs, brush piles, rock walls, abandoned foundations, or rock ledges. They may be resting or waiting for prey. Watch where you place your hands and feet. Walk around, rather than over, fallen logs. When traveling through areas thought to contain venomous snakes, you can minimize the possibility of an encounter by using common sense. If you encounter a snake do your best to stay calm and look around as there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT apply ice, cut the wound, or apply a tourniquet.** Try to identify the type of snake: note color, size, patterns, and markings to assist medical personnel with proper treatment measures (see below – Identification of Poisonous Snakes).

Six species snakes native the Whiting field area are venomous and are as follows:

1. *Copperhead*

2. *Canebrake Rattlesnake*



3. Eastern Diamondback Rattlesnake



4. Pigmy Rattlesnake



5. Cottonmouth

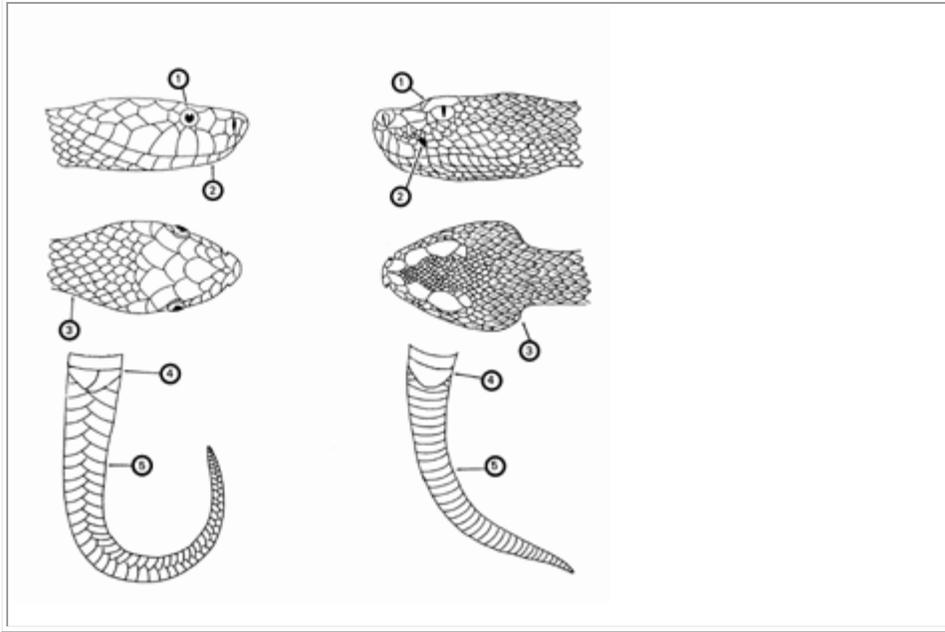


6. Coral Snake



**Identification of Poisonous Snakes**

Major Identification Features Non-venomous Snake	Major Identification Features Venomous Snake
<ol style="list-style-type: none"> <li>1. Round pupils</li> <li>2. No sensing pit</li> <li>3. Head slightly wider than neck</li> <li>4. Divided anal plate</li> <li>5. Double row of scales on the underside of the tail</li> </ol>	<ol style="list-style-type: none"> <li>1. Elliptical pupils</li> <li>2. Sensing pit between eye and nostril</li> <li>3. Head much wider than neck</li> <li>4. Single anal plate</li> <li>5. Single scales on the underside of the tail</li> </ol>



#### 9.7.6.2.1 Poisonous Plants

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas, which are common to the site. They are more commonly found in moist areas or along the edges of wooded areas. Shrubs are usually 12 to 30 inches high, or can also be a tree-climbing vine, with triple leaflets and short, smooth hair underneath. Plants are red and dark green in Spring and Summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds in Fall, but plants lose its (yellowed, then brown) leaves in Winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons.

Become familiar with the identity of these plants (see below). Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

**Poison Ivy**



**Poison Sumac**



**Poison Oak**



**Exposure:**

Contamination with poison oak, ivy or sumac can happen through several pathways. These include:

- Direct skin contact with any part of the plant.
- Contact with clothing that has been contaminated
- Contact from removing shoes that have been contaminated, as your shoes may be coated with oil)
- Sitting in a vehicle that has become contaminated
- Contact with any objects or tools that have become contaminated.

Exposure to poison oak, ivy or sumac often becomes an OSHA recordable illness. Take proper action if you are potential contaminated. The dermatitis is so severe that many people seek medical care and get prescription cortisone creams or steroid shots to reduce the suffering caused by the itch.

**Best Work Practices:**

If you must work on a Site that has been identified to potentially contain poison oak, ivy or sumac, the following precautions are necessary:

- Identify plants containing urushiol – The best way to prevent exposure is to recognize the plant and avoid working in areas where poison oak, ivy or sumac is present.
- If you must work in areas with urushiol containing plants, contact you project manager and health and safety manager to determine the best procedures to prevent contamination.
- Do not drive vehicles onto the Site where it will come into contact with poison oak, ivy or sumac. Vehicles which need to work in the area, such as drill rigs or heavy equipment must be washed and decontaminated as soon as possible after leaving the Site.
- All tools used in the area, including those used to cut back the plants, surveying instruments used in the area, air monitoring equipment or other test apparatus must be decontaminated before they are placed back into the Site vehicle. If on-Site decontamination is not possible, use plastic to wrap any tools or equipment until they can be decontaminated. If working on or near the ground surface, place plastic on the ground to cover the grass and foliage.
- Personal protective equipment (PPE), including Tyvek coveralls, gloves, and boot covers must be worn. PPE and plastic used to cover the ground must be placed into separate plastic bags and sealed if they are not disposed immediately into a trash receptacle.
- Shower as soon as possible to remove any potential contamination. Any body part with suspected or actual exposure should be washed with “Tecnu” or other product designed for removing urushiol. If you do not have Tecnu wash with cold water. Do not take a

bath, as the oils can form an invisible film on top of the water and contaminate your entire body upon exiting the bath.

- Zanafel™ may also be used to treat exposed areas that are experiencing signs and symptoms of poison oak, ivy or sumac contamination. Refer to the Zanafel™ information guide below for specific product and contact information.
- Use products such as IvyBlock™ to prevent poison oak, ivy and sumac contamination. IvyBlock™ is approved by the FDA to prevent the rash caused by poison oak, ivy and sumac.
- If there is exposure use the following first aid procedures, or others you may find to alleviate the pain and itching.

### **Poison Oak, Ivy, and Sumac First Aid :**

#### **Self-Care/First Aid**

- Wash (decontaminate) all affected areas with warm water and a strong soap.
- Keep your hands away from your eyes, mouth and face.
- Do not scratch or rub the rash.
- Apply any of these to the skin rash:
- Calamine (not Caladryl) lotion
- Zanafel™ lotion
- Zinc oxide ointment
- Paste made with baking soda - mix 3 teaspoons of baking soda with 1 teaspoon of water
- Take an over-the-counter antihistamine such as Benadryl, as stated on the label
- If self-care/first aid measures don't bring relief, call your doctor.

### **Urushiol Plant Facts:**

#### **Urushiol Oil is Potent**

- Only 1 nanogram (billionth of a gram) needed to cause rash
- Average is 100 nanograms for most people
- 1/4 ounce of urushiol is all that is needed to cause a rash in every person on earth
- 500 people could itch from the amount covering the head of a pin
- Specimens of urushiol several centuries old have been found to cause dermatitis in sensitive people.
- 1 to 5 years is normal for urushiol oil to stay active on any surface including dead plants
- Derived from **urushi**, Japanese name for lacquer

### **New Cream to Treat Exposure to Poison Plants:**

Exposure to poison oak, ivy and sumac can be uncomfortable, and in some cases the rash can become so severe that medical care is required. A relatively new product is available Zanafel™ ([www.zanafel.com](http://www.zanafel.com)) that helps prevent blistering and itching from becoming severe. If you are working in an area with poison oak, ivy or sumac, you can obtain this cream by contacting and notifying your supervisor of the need to purchase this material.

Please remember, the cream does not replace preventative measures, including:

- Avoiding contact with poison oak, ivy and sumac.
- Wearing Tyvek coveralls and gloves to prevent contact.
- Washing with Tecnu® (or a similar product) after potential exposure.
- Washing clothing and decontaminating equipment with an oil-cutting detergent.

### **More information about Zanafel (from Zanafel):**

Zanafel™ is an effective wash for urushiol-induced contact dermatitis. Urushiol is the toxin known to cause the itching and rash associated with poison oak, ivy, sumac, poisonwood, and related plants. Zanafel works by surrounding urushiol and bonding with it, thereby enabling it to be rinsed away. Unlike some products that require use within 10 to 20 minutes of contact or that required continued use until the rash is gone (which can take up to 5 weeks), Zanafel offers relief at any stages of the reaction and often with only one wash. Individuals with particularly severe reactions may require additional washes. Most individuals experience relief from the itching within 30 seconds of application. The rash will begin to subside within hours if the reaction is mild to moderate. Severe and systemic cases will still require medical attention. Severe cases are defined as breakouts that are present on more than 15-percent of the body, and new breakouts continue to develop after day 4.

#### **9.7.6.3 Ticks**

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into/taped to boots; spray **only outside** of clothing with permethrin or permethrin and spray skin with only N, N-diethyl-meta-polyamide (DEET); and check yourself frequently for ticks. Where exposure to ticks is verified, personnel shall consider wearing “bug-out” suits to minimize potential exposures to ticks or other biting insects (i.e., chiggers). However, when these suits are used when ambient air temperatures are elevated (> 70 degrees) heat stress preventive measures and monitoring protocols must be implemented. See the Heat Stress section in this APP for additional information.

### **Hazard Control:**

The methods for controlling exposure to ticks include, in order of most-preferred to least:

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acaricide

- Personal protection through use of repellants and protective clothing
- Frequent tick inspections and proper hygiene

Vaccinations are not available and preventive antibiotic treatment after a bite is generally not recommended.

### **Tick Identification:**

There are five varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These tick varieties include:

- Deer (Black Legged) Tick (eastern and pacific varieties)
- Lone Star Tick
- Dog Tick (American and Brown)
- Rocky Mountain Wood Tick
- Western Black-legged tick

### **Illnesses and Signs/Symptoms:**

There are six distinguishable tick-borne pathogens that cause human illness in the United States. These pathogens may be transmitted during a tick bite – normally hours after attachment. The illnesses, presented in approximate order of most common to least, include:

1. Lyme (bacteria)
2. Rocky Mountain Spotted Fever (RMSF) (bacteria)
3. Ehrlichiosis (bacteria)
4. Southern Tick-Associated Rash Illness (STARI) (bacteria)
5. Tularemia (Rabbit Fever) (bacteria)
6. Babesia (protozoan parasite)

Symptoms will vary based on the illness, and may develop in infected individuals typically between 3 and 30 days after transmission. Some infected individuals will not become ill or may develop only mild symptoms. These illnesses present with some or all of the following signs and symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, and small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or lesions. A variety of long-term symptoms may result when untreated, including debilitating effects and death.

### **Tick Removal:**

- Use fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.
- Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. (If this happens, remove mouthparts with tweezers. Consult your healthcare provider if infection occurs.)
- Do not squeeze, crush, or puncture the body of the tick because its fluids (saliva, hemolymph, and gut contents) may contain infectious organisms. Releasing these organisms to the outside of the tick's body or into the bite area may increase the chance of infectious organism transmission.

- Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, elderly persons, and immune-compromised persons may be at greater risk of infection and should avoid this procedure.
- After removing the tick, thoroughly disinfect the bite Site and wash your hands with soap and water.
- You may wish to save the tick for identification in case you become ill. Your doctor can use the information to assist in making an accurate diagnosis. Place the tick in a plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag. See “First Aid and Medical Treatment” information below.

Previously infected individuals are not conferred immunity – re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

#### **First-Aid and Medical Treatment:**

Tick bites should always be treated with first-aid. Clean and wash hands and disinfect the bite Site after removing embedded tick. Consult a healthcare professional if infection or symptoms and effects of tick-borne illnesses are developing.

Medical treatments for tick-borne infections include antibiotics and other medical interventions. Diagnosis of specific illness involves both clinical and laboratory confirmations. Preventive antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

#### **Tick Analysis Procedure for Lyme disease:**

For tick removal, follow the instructions in your tick removal kit using a fine pointed pair of tweezers. If the tick is alive, place it in two layered zip-lock bags. It is highly recommended that you wear gloves when removing the tick from the skin to avoid infection.

It is important to remove the entire tick and place it in a zip-lock bag. Place the zip-lock bag in an envelope and contact your applicable health care representative, project manager and health and safety representative (see Attachment 5 of this APP) for instructions on where to send the tick for analysis of certain tick-borne pathogens.

#### **9.7.6.4 Spiders - Brown Recluse**

It is regarded by many as the most dangerous spider in the United States. The Brown Recluse can be present as a result of interstate shipping/transportation the Brown Recluse spider can be found most anywhere in the United States.

Brown Recluse Spiders are usually 1 inch or larger in size, including the legs and can grow as large as 3 inches. Young Brown Recluse spiders are smaller and somewhat lighter in color. Brown recluse spider bites don't always hurt right away.



In fact, you may not know that you have been bitten until other symptoms appear. Symptoms of a brown recluse spider bite may include the following:

- Reddened skin followed by a blister that forms at the bite Site.
- Mild to intense pain and itching for 2 to 8 hours following the bite.
- An open sore with a breakdown of tissue (necrosis) that develops within a few hours to 3 to 4 days following the bite and the area may become painful, itchy, hot, swollen, red and tender. An irregular ulcerous sore, caused by necrosis, will often appear that is from 1/4 inch to 10 inches in diameter. Prompt attention is the best defense against preventing the necrosis. The wound is often described as being reddish and surrounded by a bluish area with a narrow whitish separation in between the red and the blue. This gives it the famous "bull's eye" pattern. In just hours, a bite from the highly venomous Brown Recluse spider can create blisters and cause tissue damage.

Some people have a severe, systemic (whole-body) reaction to brown recluse spider bites, including the rapid destruction of red blood cells and anemia. Signs and symptoms include:

- Fever and chills.
- Skin rash all over the body with many tiny, flat purple and red spots.
- Nausea or vomiting.
- Joint pain.

If you think you have been bitten by a brown recluse spider:

- Remain calm. Too much excitement or movement will increase the flow of venom into the blood.
- Try to collect the spider, without being bitten, (even a mangled specimen has diagnostic value), if possible, for positive identification by a spider expert. A plastic bag, small jar, or pill vial is useful and no preservative is necessary, but rubbing alcohol helps to preserve the spider.
- Apply a cool, wet cloth to the bite or cover the bite with a cloth and apply an ice bag to the bite.
- Do not apply a tourniquet. It may cause more harm than benefit.
- Try to positively identify the spider to confirm its type.
- Seek prompt medical attention.

A brown recluse bite can be serious and will likely require immediate medical care. Seek medical attention if you believe you have been bitten by a recluse spider, especially if severe symptoms develop throughout your body or an open sore and necrosis develop. A brown recluse spider bite is diagnosed through a physical examination and questions about the bite. You should be prepared to describe the spider, where and when the bite took place, and what you were doing at the time. Your health professional will ask what your main symptoms are, when they began, and how they have developed, progressed, or changed since the bite.

- Before utilizing outdoor temporary sanitary facilities, be sure to check the unit to verify there are not any spiders.

#### 9.7.6.5 Spiders - Widow

Black Widows can potentially be encountered at the site. Females range from 8-15 mm in body length; males are smaller, sometimes very small (2 mm). Most have globose, shiny abdomens that are predominantly black with red markings (although some may be pale and/or have lateral stripes), with moderately long, slender legs. These spiders are nocturnal and build a three-dimensional tangled web, often with a conical tent of dense silk in a corner where the spider hides during the day. In nature, most species are found under rocks and logs, but they readily adapt to human-altered environments, where they are most commonly found in outbuildings (sheds, barns, privies), water meter holes, nursery cans, and under any item or structure (e.g., barbeque grill, slide, sand box) that has been undisturbed for a lengthy period.

Formerly, many bites by black widows (usually by female spiders) occurred in outhouse structures, but widow bites occur most frequently when the spider is trapped against human skin, either by reaching under objects where the spider is hiding or when putting on clothing, gloves or shoes containing the spider. Widow spiders are generally very timid and only bite in self-defense when they accidentally contact humans.

Northern Black



Northern Black



Note: The northern widow is similar to the southern widow except the telltale red markings are shaped slightly different.

Bite symptoms are systemic, spreading through the lymphatic system, and usually start about 1-3 hours after the bite. The most common symptoms are intense pain, rigid abdominal muscles, muscle cramping, malaise, local sweating, nausea, vomiting, and hypertension. Other symptoms may include tremors, labored breathing, restlessness, increased blood pressure, and fever. If left untreated, widow bite symptoms usually last 3 to 5 days.

If bitten, remain calm, and immediately seek medical attention (contact your physician, hospital and/or poison control center). Apply an ice pack directly to the bite area to relieve swelling and pain. Try to collect the spider, without being bitten, (even a mangled specimen has diagnostic value), if possible, for positive identification by a spider expert. A plastic bag, small jar, or pill vial is useful and no preservative is necessary, but rubbing alcohol helps to preserve the spider. A hospital stay may be recommended, particularly for those with a heart condition or with health problems. A physician may administer a specific antivenin to counteract the venom or calcium gluconate to relieve pain. Calcium gluconate and/or antivenin may be administered to relieve or counteract symptoms.

- Before utilizing outdoor temporary sanitary facilities, be sure to check the unit to verify there are not any spiders.

#### 9.7.6.6 Blood borne Pathogens

Blood borne pathogens are pathogenic microorganisms present in human blood or other potentially infectious material that can cause disease. These pathogens include, but are not limited to, the Hepatitis B Virus (HBV) and the Human Immunodeficiency Virus (HIV). Other potentially infectious material includes any human body fluid that is visibly contaminated with blood, such as saliva or vomit. It also includes all body fluids in situations where it is difficult or impossible to differentiate between body fluids, such as during an emergency response and any unfixed tissue (other than intact skin) from a human (living or dead).

In emergency medical situations, certain employees may need to render first aid as a collateral duty in response to workplace accidents or injuries. This category includes the SSHO, site managers/supervisors, or individuals certified in FA and CPR and shall have received training in exercising universal precautions against exposure to blood borne pathogens as a component to FA/CPR training, which meets the intent of 29CFR1910.1030. However, additional worker training programs in to blood borne pathogens may also be required when it is expected that employees could contact landfill waste or other waste streams containing potentially infectious material. This situation is not reasonably expected for this project. Blood borne pathogen employee training is also complemented by other regularly scheduled employer training curriculums that are typically executed for the HAZWOPER industry, regulated under 29CFR1910.120/29CFR1926.26. The only worker exposure to blood borne pathogens anticipated for this project will potentially be to those individuals providing FA/CPR to an injured or “down” worker.

To eliminate or minimize employee exposure to blood borne pathogens, workers who may be exposed to blood borne pathogens or potentially infectious material must implement the following hazard control measures.

Employees expected to render first aid shall be cognizant of and adhere to the following with regard to potential exposure to blood borne pathogens:

- First aid kits and a Blood borne Pathogens Protection Kit shall be immediately available at the Site. The kit is commercially available through most safety or medical supply vendors.
- These kits shall contain gloves, masks, CPR protectors, biohazard disposal bags, antiseptic cleanser, splash-proof goggles, towels, wipes, and an absorbent powder to clean up spills. Gloves, masks, and other PPE measures must be donned by personnel responding to emergency or first aid situations where exposure to Blood borne Pathogens could occur.

A portable eye wash station or means of conducting eye washing or flushing shall be readily available at the project site location.

- Always wash your hands and face with antiseptic soap and running water after contacting potentially infectious material. If washing facilities are unavailable, use an

antiseptic cleanser with clean paper towels or moist towelettes. When antiseptic cleansers or towelettes are used, always rewash your hands and face with soap and running water as soon as available. Do not consume food or beverages, smoke, chew tobacco, or perform another hand to eye/face/mouth activity until after thoroughly cleaning your hand (with antiseptic soap and water), then your face and only after the employee has removed themselves from the designated work area that contains materials that can be reasonably considered being contaminated with blood borne pathogens.

- Use universal precautions when dealing with materials or situations where there is a potential for blood borne pathogens. Universal precaution is an approach to infection control whereby all human blood and potentially infectious material are treated as if known to be infectious for HIV, HBV, and other blood borne pathogens.
- Personnel who may be exposed to Blood borne Pathogens should review and implement all applicable components of CH2M HILL SOP # HSE&Q 202, Blood borne Pathogens.

#### 9.7.6.7 Mosquito Bites

Because of the detection of the West Nile Virus throughout the United States, it is recommended that preventive measures be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent.

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing pyrethrum or DEET because mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET. DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

#### **Symptoms of Exposure to the West Nile Virus:**

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

The West Nile Virus incubation period is from 3 to 15 days.

If you have any questions or to report any suspicious symptoms, contact our line supervisor, project health and safety representative and/or designated corporate occupational physician, as per your employers policy, for support with suspect exposures to West Nile Virus.

#### 9.7.6.8 Rabid Animals

Encounters with a rabid animal can lead to rabies transmission when virus from the animal's saliva, brain tissue, or spinal fluid enters open cuts or wounds in skin or mucous membranes. Therefore, not every encounter with a rabid animal is a true exposure requiring intervention. Treatment is often provided unnecessarily to people who have encountered but had no true exposure to a potentially rabid animal.

Any penetration of the skin by an animal's teeth is considered a "bite exposure." Local wound care should be performed immediately on anyone bitten by an animal. Local treatment of wounds involving immediate and extensive washing of all bite wounds, scratches, or other Sites of potential exposure for 10 minutes with soap and water is arguably the most important measure for preventing rabies following an exposure to a rabid animal. Experiments done in animals suggest that thorough and vigorous cleansing to the depth of the wound with a 20% soap solution can reduce the risk of developing rabies. Tetanus booster vaccine (Td) should be given if indicated. A health care provider should be consulted to determine whether other measures are necessary. When a bite exposure has been determined, laboratory testing of the animal, if available, may be indicated depending upon the circumstances of the exposure (such as whether it was provoked or not) and the species involved. The risks associated with bites from different animals vary from place to place. For work on this particular contract, contact with rabid dogs, cats, raccoons, and rats could be possible.

"Non-bite exposures" include any scratches, abrasions, or contamination of mucous membranes by an infected animal's saliva, brain tissue, or spinal fluid. Other types of contacts (such as with the blood, urine, feces, or fur of an animal) would not by themselves be considered exposures capable of transmitting rabies even if the animal were known to be rabid. The virus is not hardy; once dry, saliva containing rabies virus is considered non-infectious.

#### 9.7.7 Buried Objects/Utilities (locating)

Do not begin excavation or other ground disturbing activities until a check for underground utilities and similar obstructions has been conducted. Contact the local utility mark-out or locating service identified below to make a request to verify the presence or absence of underground utilities that may be within your proposed work area.

- **Local Utility Mark-Out Service**
- **Name:** Sunshine State One Call of Florida, Inc.
- **Phone:** (800) 432-4770
- **Website:** <http://www.callsunshine.com/corp/index.html>

In addition to contacting the local utility mark-out service/utility owner, review current and historic engineering or as-built drawings as a supplement to the mark-out service/utility owner location of known underground utilities that may be present in the area to be disturbed.

As a best management practice, or in areas where sufficient mark-out of utilities by the utility owner's representative is potentially insufficient or where available facility engineer drawings appear incorrect or erroneous data seems likely, then the services of an independent "third party" utility location surveyor must be secured to identify additional and potentially undiscovered/unconfirmed buried utilities in the proposed area of disturbance. The independent utility locator may need to use some or all of the following survey technologies to verify the location of potential buried utilities in the proposed disturbance area:

- **Ground Penetrating Radar (GPR)**, which can detect pipes, including both metallic and non-metallic gas pipes, tanks, conduits, and cables, at depths up to 30 feet depending on equipment. Sensitivity for both minimum object size and maximum depth detectable depends on equipment selected, soil conditions, etc.
- **Radio Frequency (RF)** involves inducing an RF signal in the pipe or cable and using a receiver to trace it. Some electric and telephone lines emit RF naturally and can be detected without an induced signal. This method requires knowing where the conductive utility can be accessed to induce RF field if necessary.
- **Dual RF** is a modified version of RF detection using multiple frequencies to enhance sensitivity but with similar limitations to RF.
- **Ferromagnetic Detectors** are metal detectors that will detect ferrous and non-ferrous utilities. Sensitivity is limited, e.g., a 100-mm iron disk to a depth of about one meter or a 25-mm steel paper clip to a depth of about 20 cm.
- **Electronic markers** are emerging technologies that impart a unique electronic signature to materials such as polyethylene pipe to facilitate location and tracing after installation. Promising for future installations but not of help for most existing utilities already in place.
- **Vacuum excavation** is not applicable to this TO.

#### 9.7.7.1 Procedure

The following procedures shall be used to identify and mark underground utilities during subsurface construction activities on the project.

- Contact the or the local state/regional utility protection service mark-out service (i.e., Miss Utility, Call Before You Dig, Dig Safe etc.) at least three (3) working days prior to executing the proposed work, and request that the location of underground installations be identified prior to the start of proposed ground disturbing activities. Keep copies of any written documentation (faxes, email printouts) regarding utility location verification provided by utilities owners in the office project file and in a working field file onsite.
- Request and review current/historic host facility as-built or engineering drawings, documents or records to support the location of potential underground utilities within the area to be disturbed.

- Obtain utility clearances for subsurface work on both public and private property. **Clearances are to be in writing, signed by the party conducting the clearance.** Written access approval/authorization may be necessary to perform these operations on private property.
- Secure an independent third party utility locate survey subcontractor as an additional means of locating underground utilities when necessary. The independent third party utility locate shall determine the most appropriate geophysical technique or combinations of techniques to identify the buried utilities on the project, based on the survey contractor's experience and expertise, types of utilities anticipated to be present, and specific site conditions. The utility locate survey contractor shall to survey the proposed path of subsurface construction work to confirm no buried utilities are present. Schedule the independent survey, as may be necessary.
- Identify host facility/customer specific permit and/or procedural requirements for conducting ground disturbing activities. Contact and coordinate with the host facility/Customer/ Client POC to obtain the appropriate authorization to engage in ground disturbing activities.
- Underground utility locations must be physically verified by hand digging using wood or fiberglass-handled tools when any adjacent subsurface construction activity (e.g., mechanical drilling, excavating) work is expected to come within 5 feet of the marked underground system. If subsurface construction activity is within 5 feet and parallel to a marked existing utility, the utility location must be exposed and verified by hand digging every 100 feet.
- Protect and preserve the markings of identified utilities until the markings for ground disturbing operations. If the markings of utility locations are destroyed or removed before ground disturbing operations are completed, the Project Manager or the site supervisor must notify the utility company or utility protection service to inform them that the markings have been destroyed and that a remark is required.
- Photo documentation of defined utility mark-out locations as related to proposed limits of ground disturbing activities should be conducted prior to the start of work.
- Conduct a site briefing for employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon during drilling or change in color, texture, or density during excavation that could indicate the ground has been previously disturbed).
- Update local utility companies or the state/regional utility protection service (i.e., Miss Utility, Call Before You Dig, Dig Safe etc.) utility verification request numbers as required. Include written responses to updated request verifications in the project file as verification the update was completed.

In addition to the information contained in this section, where personnel are required to perform hand augering operations for sample confirmation sampling activities, a fiberglass ground probe should be used to search ahead to the next sample interval prior to advancing the hand auger when there is a potential for encountering buried underground utilities. When performing environmental sampling decontamination of the fiberglass ground probe shall apply between sample intervals to prevent cross contamination.

#### **9.7.7.2 Unknown or Suspect Objects/Materials**

If unknown or suspect objects/materials are encountered (i.e., exposed or partially buried drums, biological waste, cylinders, munitions of explosive concern, unexpected stained/dischored soil) are encountered during site operations, ongoing activities shall be immediately suspended. AGVIQ-CH2M HILL or subcontractor personnel encountering unknown or suspect objects/materials shall:

1. Secure the area and identify the location of the object/material to the extent possible, without causing bodily injury to yourself or others and without disturbing the object,
2. Evacuate the work area,
3. Immediately notify the project manager of the encountered condition and
4. Prevent additional disturbance or otherwise handle the suspect object/material.

The site supervisor or SHSO shall contact the Project Manager and the CIH/HSPA to evaluate potential hazards associated with the specific situation encountered. The PM shall then immediately notify the Navy RPM and NTR. The project team will then address the need for the use of special procedures, engineering controls, PPE or specialized subcontract personnel to safely mitigate the situation.

#### **9.7.8 Chemical Injections**

(Reserved)

Chemical injection operations will not be performed as part of this TO.

#### **9.7.9 Concrete Work**

**(Reference CH2M HILL SOP # HSE&Q 302, Concrete & Masonry)**

(Reserved)

Concrete work will not be performed as part of this TO.

#### **9.7.10 Confined Space Entry**

**(Reference CH2M HILL SOP # HSE&Q-203, Confined Space)**

(Reserved)

Confined space entry operations will not be performed as part of this TO. The requirements of EM 385 1-1, Section 34 and 29 CFR 1910.146 are not applicable to the execution of this TO.

### 9.7.11 Cranes

(Reference CH2M HILL SOP # HSE&Q-303, Cranes)

(Reserved)

Crane operations will not be performed as part of this TO.

### 9.7.12 Demolition

(Reference CH2M HILL SOP # HSE&Q-305, Demolition)

(Reserved)

Demolition activities will not be performed as part of this TO. The requirements of EM 385 1-1, Section 23 and 29 CFR 1926 Subpart DD are not applicable to the execution of this TO.

### 9.7.13 Drilling/Direct Push Technology

(Reference CH2M HILL SOP # HSE&Q-203, Drilling)

(Reserved)

Drilling activities will not be performed as part of this TO.

### 9.7.14 Electrical Safety

(Reference CH2M HILL SOP # HSE&Q-206, Electric Safety)

Several types of electrical hazards may be encountered during the execution of the project. These hazards might include, but not be limited to, hazards associated with the establishment of temporary construction site facilities, sampling near or adjacent to utilities, use of generators/power sources, power cords or when using electric hand tools used during mobilization/demobilization operations. Where the electrical exposure hazards are possible in the work environment, the following standard work practices must be implemented.

- Review and implement all applicable components of CH2M HILL SOP # HSE&Q-206, Electrical Safety, except where other requirements may be more stringent.
- Maintain safe clearance distances between overhead power lines and sampling equipment unless the power lines have been verified as being de-energized and grounded or unless insulating barriers have been installed to prevent physical contact. To determine proper clearance from energized overhead electric lines, consult the reference table below.

Nominal System Voltage (kV)	Minimum Rated Clearance (feet)
Up to 50	10
51 - 200	15
201 - 350	20
351 – 500	25
501 – 650	30
651 – 800	35

Nominal System Voltage (kV)	Minimum Rated Clearance (feet)
801 - 950	40
951 - 1100	45

Clearance values calculated using:  
 $(\text{Initial kV} - 50\text{kV}) \times (4 \text{ in}/10 \text{ kV}) \times (1 \text{ ft}/12 \text{ in}) = \text{increased distance (ft) over 10 ft. Add this value to 10 ft to yield minimum rated clearance (All dimensions are distances from live part to employee)}$   
 Reference: US Army Corps of Engineers, EM 385 1-1, 15 Sept 08, Table 11-1.

- Only qualified personnel (by training, experience, and/or licensure) are permitted to work on electrical systems.
- Do not tamper with or access electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until hazardous energy control procedures (i.e., lock-out/tag-out) are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use electrical equipment that is identified as needed repair, improperly grounded or insulated or not operating in accordance with the manufacturers intended requirements. Remove these items from service, label the equipment or device as “Damaged – Do Not Use”. Ensure that all tools/equipment/power cords that are deemed damaged, dangerous or not operating in accordance with the manufacture’s requirements are removed from service and repaired by an authorized manufacturer repair technician or rendered inoperable and properly dispose of.
- Extension cords must be:
  - Inspected before use and events that may have caused damage to the cord before being put back into service.
  - Equipped with third-wire grounding.
  - Covered, elevated, or protected from damage when passing through work areas.
  - Protected from pinching if routed through doorways.
  - Not fastened with staples, hung from nails, or suspended with wire.
- Ground Fault Circuit Interrupters (GFCIs) as the standard method for protecting employees from the hazards associated with electric shock;
  - GFCIs shall be used on all 120-volt, single phase 15 and 20-amphere receptacle outlets which are not part of the permanent wiring of the building or structure.
  - Most generators come with GFCI. Test the GFCIs daily to determine whether they are working. If a generator is not equipped with GFCI protected circuits plug a portable GFCI into the generator and plug appliances, tools and lights into the portable GFCI.
- Electrical power tools and equipment must be effectively grounded or double-insulated and Underwriters Laboratory (UL) approved.

- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

### 9.7.15 Excavation Activities

#### (Reference CH2M HILL SOP # HSE&Q-307, Excavation & Trenching Safety)

The main focus of this CTO is the excavation of three trenches excavated to the approximate dimensions of 50 feet long, 6 feet deep, and 3 feet wide that will house the biofilter media and piping. Trench soils are expected to be uncontaminated and should be placed in a stockpile outside the biofilter footprint in an area that allows the loader to easily access each trench for backfill and allows the biofilter area to drain. Once all biofilter media have been mixed in the three stockpiles, one trench should be excavated at a time and backfilled from its own stockpile of media. Biofilter Trench 1 should be excavated and backfilled first, followed by Biofilter Trench 2 and Biofilter Trench 3.

Backfill should begin with a 4- to 6-inch layer of sand at the bottom of Biofilter Trench 1. Two 25-foot long horizontal sections of 2-inch perforated vapor distribution pipe with vertical risers at each end will be placed on the sand layer. Perforations on the vapor distribution pipes will face down, and the biofilter media will be backfilled over the piping and extend 6 inches above the top of the excavation. At this point, the Biofilter Trench 2 excavation can begin and the backfill sequence repeated. Finally, Biofilter Trench 3 will be excavated and backfilled.

Each trench will be excavated and backfilled with no anticipated employee entry. In accordance with EM 385-1-1 25.A.01, an AHA has been developed to identify the hazards and associated controls measures for this excavation. All excavations will meet or exceed the requirements defined by 29 CFR 1926, subpart P.

#### Other Excavation Activity Considerations

- Prior to opening an excavation, underground installations (i.e., utilities, fuel lines) shall be located and protected from damage or displacement. Utility companies (utility owners) and other responsible authorities shall be contacted to locate and mark the locations and, if they so desire, direct or assist with protecting the underground installations.
- When personnel will be in or around an excavation, a competent person shall inspect the excavation, adjacent areas, and protective systems daily, as needed throughout the work shifts and after every rainstorm or other hazard-increasing event. If evidence of a situation that could result in possible cave-ins, slides, failure of protective systems, hazardous atmospheres, or other hazardous condition is identified, exposed workers shall be removed from the hazard and all work in the excavation stopped until necessary safety precautions have been implemented. The competent person is also required to monitor and inspect equipment use in water removal operations (i.e., pump systems). Documentation of excavation inspections must be available on site at all times.
- A competent person is defined as:

*“An individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and who has authority to take prompt corrective measures to eliminate them.”*

- Note: The competent person should be an individual designated by the employee’s respective employer.
- Special Excavation Requirements defined by 29 CFR 1926.651 shall also be evaluated prior to the start of site excavation activities as follows:
  - The location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation. See Section 9.7.7 Buried Objects/Utilities (locating) of this APP.
  - Excavated material shall be placed at least 2 feet (0.6 meter) from the edge of excavation or greater distance as necessary to prevent excessive loading (and potential collapse) of the excavation face(s).
  - Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.
  - No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 29 CFR 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.
  - Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.
  - When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs
  - Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees. Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.
- AGVIQ personnel must notify and be granted authorization from the excavation-competent person prior to entering any excavation. AGVIQ personnel must follow all excavation requirements established by the competent person. A competent person is an individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to

employees and, who has authority to take prompt corrective measures to eliminate them. The competent person must be a person designated by the AGVIQ.

- The competent person must inspect the excavation every day and after every hazard increasing event. Documentation of this inspection must be available on site at all times.

### 9.7.16 Fall Protection

(Reference CH2M HILL SOP # HSE&Q-310, Fall Protection)

(Reserved)

### 9.7.17 Fire Prevention

#### 9.7.17.1 Major Workplace Fire Hazards

The major workplace fire hazards are as follows:

- Storage or spillage of gasoline in approved portable containers (< up to 4 -5 gallon metal safety containers).
- Electrical fires from operating site generators
- Smoking in unauthorized/ non-designated areas of the site.

#### Potential ignition sources of the above:

- Improper grounding or fuel pump equipment or generators
- Electrical malfunction of operating equipment
- Improper extinguishment of smoking materials
- Unauthorized hot work and improper hot work control procedures

#### 9.7.17.2 Fire Prevention Measures

The information provided below is the minimum Fire Prevention procedures that must be engaged for the project site operations.

- Personnel shall ONLY be allowed to smoke in designated areas, where allowed at all. Designated area must be free of combustible, flammable or potentially explosive materials.
- The project supervisor or SSHO (when designated) shall be responsible for securing, inspecting and maintaining appropriate first response, portable type fire extinguisher equipment and ensure that such equipment is kept in a state of readiness and easily accessible.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet. Use only metal safety cans for storage and transfer of fuel and use funnels and nozzles during fueling operations. Flammable liquids shall be kept in closed containers or tanks when not in use.
- Personnel performing fuel dispensing operations to heavy equipment or small engine equipment shall be responsible for the fuel sources its delivery to the intended equipment. In the event of a spill or release, the person conducting the dispensing

operation shall immediately notify the site supervisor so that appropriate corrective measures can be initiated.

- AGVIQ-CH2M HILL personnel incipient are only authorized to fight incipient stage fires to their level of training, and only when it is determined it is “safe”/appropriate to do so. Personnel responding to incipient stage fires shall consider their own personal safety when engaging such fires. Fires resulting from residual product in lines, tanks storage areas containing flammable/combustible waste should be handled by host facility or local agency Fire and Emergency Services. AGVIQ-CH2M HILL personnel ARE NOT considered Firefighting Organizations or Fire Brigades. Only “small/containable”, incipient stage fires that are containable by the use of first response fire protection equipment (i.e., 2.5- to 20-pound ABC fire extinguishers) may be controlled by AGVIQ-CH2M HILL personnel. All other response shall be considered firefighting measures and shall be conducted by facility provided or public agency firefighting teams. However, site personnel who may be required to use portable first response type fire extinguishers shall receive training meeting the requirements of 29 CFR 1910.157(g) prior to or upon mobilization to the site.
- All flammable or combustible wastes must be kept in a fire-resistant, properly labeled covered container until removed from the site.
- Sources of open flames, sparks and heat shall not be left unattended.
- A good housekeeping program that provides for the prompt removal and disposal of accumulations of combustible scrap and debris shall be implemented on the site. Self-closing containers shall be used to collect waste saturated with flammable or combustible liquids. Only non-combustible or UL labeled nonmetallic containers may be used to dispose of waste and rubbish.
- All sources of ignition shall be prohibited within 50’ of operations with a potential fire hazard.
- All sources of ignition shall be prohibited in areas where flammable and combustible liquids are stored, handled, and processed. Where it is necessary to identify such potential hazard suitable NO SMOKING, MATCHES, OR OPEN FLAME signs shall be posted in all such areas.
- Fire extinguishers will be provided so that the travel distance from any work area to the nearest extinguisher is less than 50 feet when 5 gallons or more of a flammable or combustible liquid is being used. Extinguishers must:
  - Be maintained in a fully charged and operable condition.
  - Be visually inspected each month.
  - Undergo a maintenance check each year.
  - The area in front of extinguishers must be kept clear.

- Appropriately sized, easily accessible ABC fire extinguisher in work area. Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.
- Fire extinguishers shall be approved by a nationally recognized testing laboratory and labeled to identify the listing and labeling organization and the fire test and performance standard that the fire extinguisher meets or exceeds.
- Combustible materials stored outside should be at least 10 feet from any building.
  - Mechanized equipment shall be shut down before and during fueling operations.
- Before conducting any hot work operations, a Hot Work Permit must be secured from the host facility designated fire department inspector/fire prevention officer or Government Designated Authority (GDA) when welding, cutting, heating operations or other spark producing operations are performed unless otherwise indicated by the GDA.

### 9.7.18 Flight Line Safety

(Reserved)

No TO activities will occur on, within, or immediately adjacent to or require the crossing of flight lines.

### 9.7.19 General Practices and Housekeeping

Maintaining proper site housekeeping measures promotes the elimination of slip, trip and fall hazards and exhibits a perception of pride in our work product and habits. Poor housekeeping can result in the basis of citations under 29CFR1926.25(a) or other applicable regulations. Good housekeeping practices must be implemented on every AGVIQ-CH2M HILL controlled project site and at a minimum shall be as follows:

- Maintain good housekeeping at all times in all project work areas.
- During the course of executed project operations, construction, alteration, or repairs, form and scrap lumber with protruding nails, and all other debris, shall be kept cleared from work areas, passageways, and stairs, in and around buildings or other structures.
- Combustible scrap and debris shall be removed at regular intervals during the course of construction. Safe means shall be provided to facilitate such removal.
- Containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. shall be equipped with covers and appropriately labeled. Garbage and other waste shall be disposed of at frequent and regular intervals.
- Establish common paths of travel and keep them free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.

- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Designate specific areas for the proper storage of materials.
- Store tools, equipment, materials, and supplies in an orderly manner.
- As work progresses, neatly store scrap and unessential materials or remove them from the work area.
- Provide containers for collecting trash and other debris and remove them at regular intervals.
- Clean up all spills quickly. Clean oil and grease from walking and working surfaces.

### 9.7.20 Hand and Power Tools

#### (Reference CH2M HILL SOP # HSE&Q 210, Hand and Power Tools)

Hand and power tools may be used intermittently during the support of all operations. When the use of hand and power tools is necessary to properly complete assigned tasks, the following work practices must be implemented, where applicable.

- Review and implement all applicable components of CH2M HILL SOP # HSE&Q 210, Hand and Power Tools except where other requirements may be more stringent.
- Disconnect power (electric, pneumatic) tools from energy sources when they are not in use, before inspecting them, performing cleaning/maintenance or when changing accessories (such as blades, bits, and cutters) so that an unexpected or accidental start-up of tool cannot occur.
- If an inspection of a power or hand tool indicates an item is in need repair, is improperly grounded or insulated or not operating in accordance with the manufacturers intended requirements, immediately remove the tool from service, label (or "tag") the equipment or device as "Damaged - Do Not Use". Ensure that all tools/equipment/power cords that are deemed damaged, dangerous or not operating in accordance with the manufacture's requirements are removed from service and repaired by an authorized manufacturer repair technician or rendered inoperable and properly dispose of.
- Hand tools will be used for their intended use and operated in accordance with manufacturer instructions and design limitations.
- Maintain all hand and power tools in a safe condition.
- Do not set power tools down in muddy or wet areas, which may damage the tool and/or or create a potential for electric shock.
- Use PPE (such as gloves, safety glasses, earplugs, and face shields) when exposed to a hazard from a tool. See table 1-1 of this **Attachment 1** (SSHSP) to this APP for details for Level D PPE.
- Do not carry or lower a power tool by its cord or hose.
- Portable electric power tools will be plugged into GFCI-protected outlets.

- Portable power tools will be UL listed and have a three-wire grounded plug or be double insulated.
- Safety guards on tools must remain installed while the tool is in use and must be promptly replaced after repair or maintenance has been performed.
- Store tools properly in a place where they will not be damaged or come in contact with hazardous materials.
- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications.
- Tools used in an explosive environment must be rated for work in that environment (that is, intrinsically safe, spark-proof).
- AGVIQ-CH2M HILL personnel must be provided proper training or be qualified by previous experience prior to using powder actuated tools/devices.
- When using a tool with a blade, stroke or cut away from the body with a smooth motion, where ever feasibly possible. Be careful not to use excessive force that could damage the tool, the material being cut or unprotected hands.

#### 9.7.20.1 Machine Guarding

Machine guarding for this task order is primarily associated with land clearing operations, but can also be applicable were power tools are used. The following measures must be considered to eliminate potential accidents and injuries with regard to machine guarding requirements.

- Ensure that all machine guards are in place to prevent contact with drive lines, belts, chains, pinch points or any other sources of mechanical injury.
- Maintenance and repair of equipment that results in the removal of guards or would otherwise put anyone at risk requires lockout of that equipment prior to work and this APP would have to be updated to include requirements for implementing a hazardous energy control program.

#### 9.7.20.2 Knife Use

Knives (fixed/utility) shall not be used. If it is demonstrated that a knife is the right tool for the job, this plan will be amended and the activity that knife use will be used for shall be reviewed.

#### 9.7.21 Haul Trucks

It is anticipated that haul trucks will be used for the delivery of products or materials to be incorporated into the project, and for the delivery and pick-up of equipment and waste.

All haul trucks must following the designated for the project site project. The site access and haul road for the project site has not been authorized by NAVFAC at the time this APP was prepared. It is assumed that the project haul route will be established on or before the project pre-construction meeting, but at this time it is anticipated to be as identified, in the Work Plan.

Where haul trucks are used on the project, the following work practices shall be implemented.

- Haul truck operators should ensure all persons are clear before operating trucks or equipment. Before moving, operators should sound horn or alarm. All haul trucks shall be equipped with an operational backing alarm. Haul trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots or a spotter.
- Employees shall stay off haul roads. When approaching a haul area, employees should make eye contact and communicate their intentions directly with the equipment operator.
- If material is being delivered to the site, personnel must not be positioned within the potential “flip-over” radius of the haul truck.
- Never approach operating equipment/ vehicles from the rear. Always make positive contact with the haul truck driver, and confirm that the operator has stopped the motion of the truck or does not intent to move the truck before proceeding.
- Where haul truck operators must exit the truck within the site boundary, the driver must be in the same level of PPE, maintain the same level of training and meet the same medical monitoring criteria as other site personnel in the work area. If this condition cannot be maintained, haul truck operators must remain in their truck cabs with the windows closed.
- Do not allow haul trucks operators to raise dump bed bodies underneath or in close proximity to overhead utilities or pull toward overhead utilities with dump bodies in the raised position. Haul truck operators must be cognizant of utility pole guy wires and transformers in the accessed work area.

### 9.7.22 Heavy Equipment

**(Reference CH2M HILL SOP # HSE&Q 306, Earth Moving Equipment)**

(Reserved)

Heavy equipment operations will not be performed as part of this TO.

### 9.7.23 Land Clearing Operations - General

(Reserved)

### 9.7.24 Lock-Out/Tag-Out

**(Reference CH2M HILL SOP # HSE&Q 310, Lock Out Tag Out)**

Lockout/tagout (LO/TO) will be performed prior to making electrical connections of the system to supply lines. Energy sources requiring lockout/tagout may include electrical, pneumatic, kinetic, and potential.

When lockout/tagout is necessary to perform maintenance/repair of a system, all the requirements of SOP HSE-310, Lockout and Tagout, shall be met including the following bulleted items:

- When AGVIQ-CH2M HILL controls the work, AGVIQ-CH2M HILL must verify that subcontractors affected by the unexpected operation of equipment develop a written lockout/tagout program, provide training on lockout/tagout procedures and coordinate its program with other affected subcontractors. This may include compliance with the owner or facility lockout/tagout program.
- When AGVIQ-CH2M HILL personnel are affected by the unexpected operation of equipment they must complete the electrical safety awareness module on the VO or equivalent. Authorized personnel shall inform the affected personnel of the LO/TO. Affected personnel shall not tamper with LO/TO devices.
- Standard lockout/tagout procedures include the following six steps: 1) notify all personnel in the affected area of the lockout/tagout, 2) shut down the equipment using normal operating controls, 3) isolate all energy sources, 4) apply individual lock and tag to each energy isolating device, 5) relieve or restrain all potentially hazardous stored or residual energy, and 6) verify that isolation and deenergization of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin.
- All safe guards must be put back in place, all affected personnel notified that lockout has been removed and controls positioned in the safe mode prior to lockout removal. Only the individual who applied the lock and tag may remove them.
- AGVIQ-CH2M HILL authorized employees shall complete the LO/TO training module on the VO and either the electrical safety training module on the VO or 10-hour construction training. The authorized employee must also be trained and qualified on the system they are working on (e.g., qualified electrician for working on electrical components of a system).
- When equipment-specific LO/TO procedures are not available or when existing procedures are determined to be insufficient, CH2M HILL authorized employees shall also complete the Equipment-Specific LO/TO Procedure Development Form, provided as an attachment to this HSP, to create an equipment-specific lockout/tagout procedure.

### 9.7.25 Manual Lifting

#### (Reference CH2M HILL SOP # HSE&Q 112, Manual Lifting)

Manual lifting is likely to occur during many phases of the project, but especially during all mobilization and demobilization activities as described herein and sampling events. Personnel executing assigned tasks where manual lifting is required should use the following procedures to help reduce the potential for personal injury.

- AGVIQ-CH2M HILL personnel should notify supervisors or designated safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities, such that AGVIQ-CH2M HILL may evaluate safe operational procedures with regard to the required task.
- Perform a muscle stretching routine or work warming regiment before engaging in manual lifting operations.
- Use proper lifting techniques (use of knees and not back) when lifting any object:

- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift – especially for heavy (>40 lbs.) or awkward loads.  
Note: If AGVIQ-CH2M HILL personnel are not capable of lifting 40 lbs., seek assistance from a team member to split the load.
- Make sure the path of travel is clear prior to the lift.

### 9.7.26 Noise

**(Reference CH2M HILL SOP # HSE&Q 108, Hearing Conservation Program)**

Unprotected exposure to excessive noise levels may lead to gradual and permanent hearing loss. The greater the intensity of a noise and the longer a person is exposed to the noise, the greater the chance of hearing loss. A hearing loss can be permanent or temporary. After certain noise exposures, a person may experience a temporary threshold shift (hearing loss) that results in the inability to hear certain sounds. The ability to hear will usually return. However, repeated or intense noise exposure can prevent this recovery, resulting in permanent hearing loss.

Employee hearing conservation is particularly important for the following site conditions/operations;

- Working around or adjacent to heavy earthmoving equipment.

Each employee is responsible for the following:

- Notify the site supervisor or SSHO of high-noise-level areas.
- Wear hearing protection when required.
- Complete noise training and audiometric testing (as required).
- Hearing protection will be worn when operations occur within or adjacent to high-noise sources (i.e., potentially exceeding 85 dB).

### 9.7.27 Pressure Washing Operations

Pressure washing operations may occur as part of decontamination work or prior to the final demobilization of equipment used at the site that may have contacted site COCs. Whenever pressure washing operations are performed at the site, the following procedures must be implemented.

- Rain gear (disposal coated chemical suits for Hazwoper operations), 16-inch-high, steel-toed rubber boots, safety glasses, hard hat with face shield, and inner and outer nitrile gloves should be worn, at a minimum during pressure washing operations.
- Only trained, authorized personnel may operate the high-pressure washer.
- Rinse waste from pressure washing operations must be collected and properly disposed.

- Follow manufacturer's safety and operating instructions.
- Inspect pressure washer before use and confirm dead man switch fully operational.
- The wand must always be pointed at the work area.
- The trigger should never be tied down
- Never point the wand at yourself or another worker.
- The wand must be at least 42 inches from the trigger to the tip.
- The operator must maintain good footing.
- Non-operators must remain a safe distance from the operator.
- No unauthorized attachment may be made to the unit.
- Do not modify the wand.

All leaking or malfunctioning equipment must be repaired immediately or the unit taken out-of-service.

### 9.7.28 Sample Handling

Sample handling, packaging, and preservation will be conducted during this TO. Proper work practices and procedures to be followed during sampling activities include:

- Avoiding all skin contact with water, soil, sediment or debris of undetermined chemical characterization or material that is known to be impacted by site COCs.
- PPE and Air Monitoring requirements shall be executed in accordance with in accordance with Tables 1-1 and 1-2, respectively, of **Attachment 1** (SSHSP) of the APP to minimize potential dermal and respiratory exposures to identified site contaminants of concern while conducting sample collection or characterization of potentially contaminated media (soil, water, drilling fluids/cuttings, PPE, soil vapor, etc.). In addition, good personal hygiene practices and procedures must be maintained (see Section 1.13, **Attachment 1** [SSHSP] of this APP).
- Caution should be exercised when filling bottles containing acid or base preservatives. Both liquid and vapor phases of acid can cause severe burns.
- Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents. Sample activities, sample collection, and equipment decontamination procedures.

### 9.7.29 Slips, Trips and Falls

Slip, trip and fall hazards exist in virtually ALL work environments. Even though slip, trip and fall hazards are typically thought of as posing low risk to workers, they account for a large percentage of worker injuries. As such, workers should be exercise caution about becoming complacent to recognizing and removing slip, trip and fall hazard from

designated work areas. To eliminate slip, trip and fall hazards from the work place the following should be implemented.

- Walk or climb only on equipment and/or surfaces designed for personnel access.
- Maintain three (3) points of contact when entering or exiting heavy equipment or when climbing or working from ladders.
- Observe, (mark where appropriate) and avoid areas of unprotected holes, ramps, drainage areas, and ground penetrations or protrusions ( curbs, utility structures etc.). If these conditions cannot be corrected, mark these hazards (i.e., high visibility pant, traffic cones etc.) so that workers may recognize and avoid them. Only mark where it does not mar or destroy government property, otherwise barricade as appropriate.
- Employees walking in ditches, uneven surfaces, swales and other drainage structures adjacent to roads, across undeveloped land or in controlled industrial work/process areas must use caution to prevent slips and falls, which can result in twisted or sprained ankles, knees, and backs.
- Clear/ remove materials from pathways and commonly traveled areas as soon as possible.
- Whenever possible work from areas which have flat, stable surfaces and do not enter steep sided ditches/excavations.
- Sturdy, hard toe boots that provide sufficient ankle support shall be used on AGVIQ-CH2M HILL project site.

### 9.7.30 Stairways and Ladders

**(Reference CH2M HILL SOP # HSE&Q 214, Stairways and Ladders)**

Below are the hazard controls and safe work practices to follow when using stairways and ladders. Ensure the requirements in the referenced SOP are followed.

- Stairway or ladder is generally required when a break in elevation of 19 inches (48.3 cm) or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Always obey and pay attention to warning labels or stickers on the specific ladder being used.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.

- Ladder safety training on safe use (e.g., review SOP HSE-214 as part of a safety meeting) must be documented and kept with the project files.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails.
- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials.
- Straight and extension ladders must be tied off to prevent displacement.
- Ladders that may be displaced by work activities or traffic must be secured or barricaded.
- Personnel climbing ladders shall face the ladder and maintain 3 points of contact with the ladder.
- Portable ladders must extend at least 3 feet (91.5 cm) above landing surface.
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder.
- Stepladders are to be used in the fully opened and locked position.
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder.
- Fixed ladders  $\geq$  24 feet (7.3 meters) in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet (1.8 meters) from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

### 9.7.31 Vacuum Truck Operations

(Reserved)

### 9.7.32 Vehicular Traffic (Exposure to)

**(Reference CH2M HILL SOP # HSE&Q 216, Traffic Control)**

The only significant anticipated employee exposure to vehicular traffic will be that traffic associated use and parking of site support vehicles. The information provided below is intended to provide standard work practices must be exercised when personnel are working in or around traffic, haul truck routes or near an area where traffic controls have been established.

- When parking your vehicle, park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so it can serve as a barrier.
- Shut off and secure Site vehicles prior to exiting them. Park on level ground where possible. If parking on an incline, engage parking brake. If the vehicle has a manual

transmission, ensure the transmission is in gear (not neutral) and the parking brake is engaged before exiting the vehicle.

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic-related hazards and required controls – sun glare, rain, wind, limited sight-distance, hills etc.
- Always remain aware of an escape route, such as behind an established barrier or parked vehicle.
- Always pay attention to moving traffic – never assume drivers are looking out for you.
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from a haul truck to perform assigned duties, a “buddy system” should be used, where one worker is looking toward traffic.
- Work area should be protected by a physical barrier.
- Lookouts should be used when physical barriers are not available or practical.

In addition to the above work practices, AGVIQ-CH2M HILL personnel and AGVIQ-CH2M HILL subcontractors shall adhere to the following procedures while operating motor vehicles or other motorized equipment on military/government facilities.

- Always use a seat belt while driving on military/government controlled facilities.
- Always observe posted speed limits, traffic signs and signals.
- Never use a cell phone or two-way radio while driving on military/government controlled facilities

Violating these requirements may result in loss of military/government facility driving privileges.

### **9.7.33 Visible Lighting**

Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness (including dusk and dawn) requires the set-up of supplemental lighting equipment. (Note: A general “rule of thumb” is that the illumination intensity must be sufficient to read a newspaper without difficulty).

At this time, it is that no work executed under this TO will be performed at night. If work is to be performed at night, a night operations lighting plan shall be developed to ensure that all activities. Although it is not anticipated that work executed under this TO will be performed during dusk, dawn or night time periods, the chart below provides a reference for illumination requirements for various construction related work environments.

Illumination (Foot Candles)	Illumination (Lux)	Area of Operation
5	~ 55	General construction area lighting
3	~ 33	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas
5	~ 55	Indoors: warehouses, corridors, hallways, and exit ways
5	~ 55	Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved caplights shall be acceptable for use in the tunnel heading)
10	~ 108	General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active store rooms, mess halls and indoor toilets and workrooms.)
30	~ 323	First aid stations, infirmaries, and offices

**Notes:**

A **foot candle** is a unit of illumination on a surface that is everywhere one foot from a point source of one candle.

A **lux** is a unit of measurement of the intensity of light. It is equal to the illumination of a surface one meter away from a single candle.

**CONVERSIONS**

Foot Candles (FC) = Lux x .0929

Lux = Foot candles x 10.76 - (i.e.: 50 FC = 538 LUX)

The following safe work practices shall be considered with regard to lighting in the workplace.

- Do not enter poorly lit areas without first providing portable illumination.
- Do not use non-explosion proof lighting in areas of flammable or combustible gases or liquids.

**9.7.34 Welding or Cutting Operations**

(Reference CH2M HILL SOP # HSE&Q 314, Welding & Cutting)

(Reserved)

Welding or cutting is not anticipated for this TO.

**9.7.35 Working Alone**

(Reserved)

No site personnel will be allowed to work alone on this project.

**9.7.36 Working Around Material Handling Equipment**

The operation of material handling equipment (forklift equipment, haul trucks) will be an integral component to the completion of the remedial objectives for the project and it is

important to observe the following measures when working in the same areas as heavy equipment and haul trucks.

- Never approach operating equipment/vehicles from the rear. Always make positive contact with the operator, and confirm that the operator has stopped the motion of the equipment.
- Never approach the side of operating equipment; remain outside of the swing and turning radius.
- Maintain distance from pinch points of operating equipment/vehicles.
- Never turn your back on any operating equipment/vehicles.
- Never climb onto operating equipment or operate subcontractor/client equipment/vehicles.
- Never ride equipment/vehicles unless authorized to do so and unless it is designed to accommodate passengers (equipped with firmly attached passenger seat).
- Suspended loads shall not pass over workers at any time.
- Site personnel shall be prohibited from passing under suspended loads.
- Never use equipment as a personnel lifts; do not ride excavator buckets, crane hook, or material handling equipment forks.
- Always stay alert and maintain a safe distance from operating equipment, especially equipment/vehicles on cross slopes and unstable terrain.
- AGVIQ-CH2MHILL personnel will pull to the side of the road when encountering heavy equipment. Even if the heavy equipment is not loaded with cargo, AGVIQ-CH2MHILL personnel will still pull to the side of the road and stop until the forklift has passed.

### 9.7.37 Working on or Over Water

(Reserved)

It is not anticipated that working on or over water will not be encountered on this TO.

## 9.8 Hazard Communication Program (06.B.01)

**(Reference CH2M HILL SOP # HSE&Q 316, Hazard Communication Program TIKIGAQ Corporation Hazard Communication Program)**

A hard copy of the AGVIQ, LLC, and CH2M HILL, Inc. Hazard Communication program information and MSDS material shall be provided at the project site.

In general, the site supervisor or SSHO will be the main contact in any onsite emergency coordination or communication situation and will ensure offsite emergency agencies have been contacted prior to the start of and verify that emergency contact numbers contained in this APP are accurate/operational work. The site supervisor or SSHO will communicate with all potential emergency response organizations that would respond to an onsite

emergency condition. In the event that during an emergency situation, the primary site supervisor or SSHO is not available or not capable of performing this function, an alternate site supervisor or SSHO or Site Supervisor can fulfill these duties. The site supervisor or SSHO or designee will serve as the Hazard Communication Coordinator, and will perform the following:

- Review the COCs and other applicable hazard communication information contained this APP.
- Request or confirm locations of MSDSs from the client, contractors, and subcontractors or material vendors for chemicals to which AGVIQ-CH2M HILL employees are potentially exposed. Maintain MSDSs in this APP (**Attachment 6**).
- Complete an inventory of chemicals brought onsite. See Attachment 6 of this APP. Give employees required chemical-specific HAZCOM training information using the format included in **Attachment 7** of this APP.
- Confirm that an inventory of chemicals brought onsite is available.
- Prior to, or as chemicals arrive onsite, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

### 9.8.1 Shipping and Transportation of Chemical Products

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the AGVIQ-CH2M HILL Project Manager and program regulatory specialist for additional information.

## 9.9 Process Safety Management (06.B.04)

(Reserved)

The requirements of EM 385 1-1, Section 06.B.04 are not applicable to this TO.

## 9.10 Lead Abatement Plan (06.B.05)

(Reserved)

A lead hazard evaluation has been performed for the site and the maximum levels of lead to be encountered at the site are not anticipated to have the potential to cause a lead exposure above the OSHA action level of 30  $\mu\text{g}/\text{m}^3$ . The type of work being performed does not fall into the category of lead abatement and therefore the requirements of EM 385 1-1, Section 06.B.05 are not applicable to this TO.

## 9.11 Asbestos Abatement Plan (06.B.05)

(Reserved)

The requirements of EM 385 1-1, Section 06.B.05 are not applicable to this TO.

## 9.12 Radiation Safety Program (06.E.03)

(Reserved)

There are no expected radiological hazards associated with the execution of this TO. The requirements of EM 385 1-1, Section 06.E.03 are not applicable to this TO.

## 9.13 Abrasive Blasting (06.H.01)

(Reserved)

There are no abrasive blasting operations associated with the execution of this TO. The requirements of EM 385 1-1, Section 06.H.01 are not applicable to this TO.

## 9.14 Heat/Cold Stress Monitoring Program (06.I.02)

### 9.14.1 Heat Stress Monitoring and Prevention

Because the work may be performed during periods where high ambient air temperatures could be prevalent, there is a potential for the development of heat stress related disorders. Workers should be aware of necessary procedures to prevent heat related disorders, be cognizant of the signs and systems that indicate heat related disorders are occurring and know when first aid or medical treatment may be required to treat heat related disorders. The following information is provided as procedural information to monitor and prevent heat related injuries to site workers, while performing assigned tasks.

- It is recommended that personnel drink 16 ounces of water before beginning work. Water maintained at 50°F to 60°F shall be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads.
- Use cooling devices, such as cooling vests, to aid natural body ventilation.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Whenever possible, avoid direct sun, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.

- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SSHO to avoid progression of heat-related illness.
- **To counteract the onset of heat stress symptoms, a work-break regimen must be established during the executed work.**

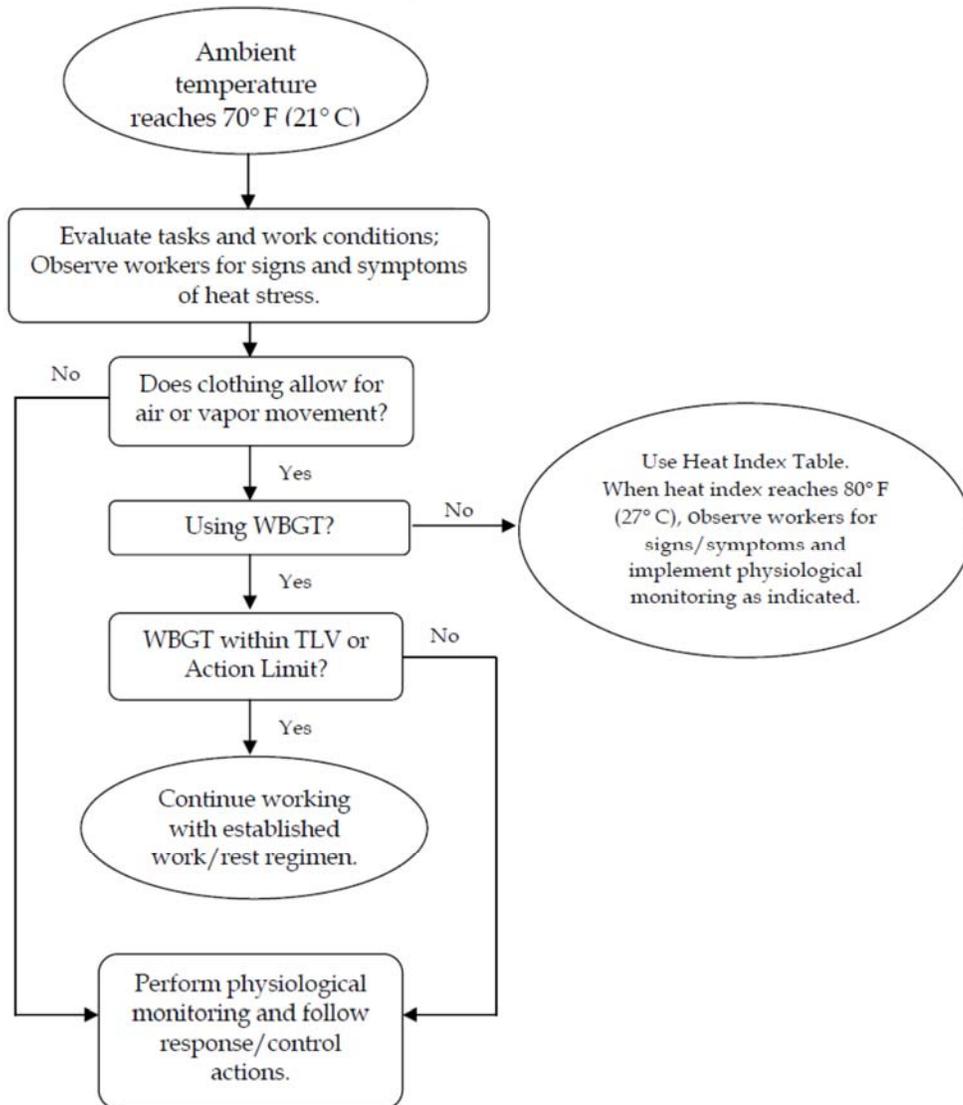
For employees in permeable work clothing, Wet Bulb Globe Temperature (WBGT) Index or physiological monitoring shall be conducted and work/rest regimens established.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
<b>Signs and Symptoms</b>	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature (104F or above).
<b>Treatment</b>	Remove to cooler area. Remove outer impermeable protective clothing. Rest victim lying down in supine position (on back, facing up) with head shoulders slightly elevated. Increase fluid intake. Recovery usually is prompt and complete. Where effected person is conscious, have them loosen their clothing to promote cooling surface between clothing/body.	Remove to cooler area. Remove outer impermeable protective clothing. Remove to cooler area. Remove outer impermeable protective clothing. Rest victim lying down in supine position (on back, facing up) with head shoulders slightly elevated.. Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection. Where effected person is conscious, have them loosen their clothing to promote cooling surface between clothing/body.	Remove to cooler area. Remove outer impermeable protective Rest victim lying down in supine position (on back, facing up) with head shoulders slightly elevated. Increase fluid intake. Where effected person is conscious, have them loosen their clothing to promote cooling surface between clothing/body.	Remove to cooler area. Rest victim lying down in supine position (on back, facing up) with head shoulders slightly elevated. Administer fluids by mouth. Seek medical attention immediately. Where effected person is conscious, have them loosen their clothing to promote cooling surface between clothing/body.	Remove to cooler area. Rest victim lying down in supine position (on back, facing up) with head shoulders slightly elevated. Where effected person is conscious, have them loosen their clothing to promote cooling surface between clothing/body. Call ambulance, and <u>get medical attention immediately!</u> Provide <u>sips</u> of cool water to if fully conscious and not nauseous or vomiting. Cool rapidly by soaking clothing in cool—but not cold—water. This procedure shall only be performed where directed by someone with medical training/ licensure (i.e., EMT, physician) and only as a life saving precaution. Evaluate employee's condition by an occupational physician prior to resuming normal assigned duties.

## 9.14.2 Monitoring Heat Stress

### Thermal Stress Monitoring

#### Thermal Stress Monitoring Flow Chart



#### Thermal Stress Monitoring – Permeable or Impermeable Clothing

When permeable work clothes are worn (street clothes or clothing ensembles over street clothes), regularly observe workers for signs and symptoms of heat stress and implement physiological monitoring as indicated below. This should start when the heat index reaches 80° F (27° C) [see Heat Index Table below], or sooner if workers exhibit symptoms of heat stress indicated in the table above. These heat index values were devised for shady, light wind conditions; exposure to full sunshine can increase the values by up to 15°F (8°C). Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

When wearing **impermeable clothing** (e.g., clothing doesn't allow for air or water vapor movement such as Tyvek), physiological monitoring as described below shall be conducted when the ambient temperature reaches 70° F (21° C) or at a lower temperature when workers begin to exhibit signs and symptoms of heat stress.

Heat Index	Possible Heat Disorders	Minimum Frequency of Physiological Monitoring
80°F - 90°F (27°C - 32°C)	Fatigue possible with prolonged exposure and/or physical activity	Observe Workers for signs of heat stress and implement physiological monitoring if warranted.
90°F - 105°F (32°C - 41°C)	Sunstroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity	Every 2 hours, or sooner, if signs of heat stress are observed.
105°F - 130°F (41°C - 54°C)	Sunstroke, heat cramps, or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.	Every 60 minutes or sooner if signs of heat stress are observed.
130°F or Higher (54°C or Higher)	Heat/Sunstroke highly likely with continued exposure.	Every 30 minutes or sooner if signs of heat stress are observed.
Source: National Weather Service		

### Procedures for when Heat Illness Symptoms are Experienced

**Always** contact the RHSM when any heat illness related symptom is experienced so that controls can be evaluated and modified, if needed.

In the case of cramps, reduce activity, increase fluid intake, move to shade until recovered.

In the case of all other heat-related symptoms (fainting, heat rash, heat exhaustion), and if the worker is a CH2M HILL worker, contact the occupational physician at 1-866-893-2514 and immediate supervisor.

In the case of heat stroke symptoms, call 911, have a designee give location and directions to ambulance service if needed, follow precautions under the emergency medical treatment of this HSP.

Follow the Incident Notification, Reporting, and Investigation section of this HSP.

## 9.15 Crystalline Silica Monitoring Plan (06.M)

(Reserved)

There are no anticipated potential worker exposures to crystalline silica associated with the execution of this TO.

## 9.16 Night Operations Lighting Plan (07.A.08)

(Reserved)

No operations will be performed at night. The requirements of EM 385 1-1, Section 07.A.08 are not applicable to this TO.

## 9.17 Fire Prevention Plan (09.A)

Fire prevention shall be conducted in accordance with the information identified in Section 9.7 of the APP, Health and Safety Hazard Control Program - Fire Prevention.

## 9.18 Wild Land Fire Management Plan(09.K)

(Reserved)

The requirements of EM 385 1-1, 09.K are not applicable to this TO as no USACE prescribed or planned wild land fire management operations or potential will be executed under this TO.

## 9.19 Hazardous Energy Control Plan (12.A.01)

Hazardous Energy Control (Lock-out/Tag-out) shall be conducted in accordance with the information identified in section 9.7 of the APP, Health and Safety Hazard Control Program and will not be further elaborated upon in this section.

## 9.20 Critical Lift Plan (16.H)

(Reserved)

No critical lifts will be performed during the execution of this TO. The requirements of EM 385 1-1, Section 16 and 29 CFR 1926 Subparts CC and DD are not applicable to the execution of this TO.

## 9.21 Contingency for Severe Weather Plan (19.A.03)

See Section 9.7 Health and Safety Hazard Control Program - "Adverse Weather." Although severe weather conditions can be experienced at the site, it is anticipated that the performance period of this TO will be during periods where hurricanes and similar severe tropical storm events are generally not a significant threat (November 30 through June 1) and therefore a Hurricane Preparedness Plan will not be prepared as part of this APP for this TO.

## **9.22 Float Plan (19.F.04)**

(Reserved)

The conditions of EM 385 1-1 19.F.04 are not applicable to this work.

## **9.23 Site Specific Fall Protection and Prevention Plan (21.C)**

(Reserved)

There are no anticipated significant fall protection hazards under the requirements of EM 385 1-1 Section 21.A that must be addressed by this APP.

## **9.24 Demolition Plan(23.A.01)**

(Reserved)

Demolition activities will not be performed during the execution of this TO. The requirements of EM 385 1-1, Section 23 and 29 CFR 1926 Subparts t and DD are not applicable to the execution of this TO.

## **9.25 Excavation/Trenching Plan (25.A.01)**

(Reserved)

Excavation or trenching activities will not be performed during the execution of this TO. The requirements of EM 385 1-1, Section 25 are not applicable to the execution of this TO.

## **9.26 Emergency Rescue (Tunneling) (26.A)**

(Reserved)

No tunneling will be performed during the execution of this TO. The requirements of EM 385 1-1, Section 26 are not applicable to the execution of this TO.

## **9.27 Underground Construction Fire Prevention and Protection Plan (26.D)**

(Reserved)

No underground construction will be performed during the execution of this TO. The requirements of EM 385 1-1, Section 26 are not applicable to the execution of this TO.

## **9.28 Compressed Air Plan (26.I.01)**

(Reserved)

No underground construction (tunnels), shafts or caissons work will be executed as part of this TO. The requirements of EM 385 1-1, Section 26.I.01 are not applicable to this TO.

## 9.29 Formwork Shoring and Removal Plan (27.C)

(Reserved)

The requirements of EM 385 1-1, Section 27 Concrete, Masonry, Steel Erection, and Residential Construction are not applicable to this TO.

## 9.30 Precast Concrete Plan (27.D)

(Reserved)

The requirements of EM 385 1-1, Section 27 Concrete, Masonry, Steel Erection, and Residential Construction are not applicable to this TO.

## 9.31 Lift Slab Plan (27.E)

(Reserved)

The requirements of EM 385 1-1, Section 27 Concrete, Masonry, Steel Erection, and Residential Construction are not applicable to this TO.

## 9.32 Steel Erection Plan (27.F)

(Reserved)

The requirements of EM 385 1-1, Section 27 Concrete, Masonry, Steel Erection, and Residential Construction are not applicable to this TO.

## 9.33 Site Safety and Health Plan of HRTW Work (28.B)

A Site Specific Safety and Health Plan addressing the requirements of section 28.B of EM 385 1-1 is located in Attachment 1 (SSHSP) of this APP.

## 9.34 Blasting Safety Plan

(Reserved)

No blasting operations will be conducted during the execution of this TO.

## 9.35 Diving Plan

(Reserved)

No diving operations will be conducted during the execution of this TO.

## 9.36 Confined Space Program

**(Reference SOP # HSE&Q 203, Confined Space)**

(Reserved)

Confined space entry operations will not be performed as part of this TO. The requirements of EM 385 1-1, Section 34 and 29 CFR 1910.146 are not applicable to the execution of this TO.

# 10.0 Risk Management Process

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AGVIQ-CH2M HILL utilizes a Behavior Based Loss Prevention System (BBLPS) to support the implementation of our Risk Management Process (RMP) by identifying, analyzing and controlling certain risks (or liabilities) that may be encountered during the execution of a its assigned projects. The BBLPS is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The five basic loss prevention tools that will be used to implement the BBLPS on this project include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Loss Prevention Observations (LPO)
- Loss and Near Loss Investigations (NLI)
- Drug Free Workplace Program (DFWP)

The Project Manager and site superintendent are responsible for implementing the BBLPS on the project site. These personnel typically delegate authority to the SSHO for the project specific implementation of the BBLPS, but the Project Manager and Site Superintendent/Supervisor or Field Team Leader remains accountable for its implementation.

In an effort to provide a safe and healthy workplace for all program participants, AGVIQ-CH2M HILL promotes and implements a Drug Free Workplace Program (DFWP). AGVIQ-CH2M HILL personnel must participate in and adhere to the requirements of the DFWP.

## 10.1 Activity Hazard Analysis

One of the key elements in executing our RMP, is the use of an Activity Hazard Analysis (AHA) for each major Definable Feature of Work (DFOW) and safety sensitive operation. An AHA defines the activity being performed, the hazards posed, and the necessary hazard control measures that must be implemented to facilitate the progression of the work in a safe and health manner. In addition, the equipment to be used to perform the activity, as well as inspection and training requirements, and competent person designations necessary to execute the task are also listed in the AHA.

Site workers review (or are briefed on the content) of the AHA before initiating the DFOW or safety sensitive operation. Worker input should be solicited where ever possible and included in the AHA. After employees review (or are briefed on the content of) each AHA applicable to their assigned task(s), they will acknowledge that this review was completed by adding their printed names, signatures, and the dates that the material was delivered to them or reviewed by them on the last page of the AHA form.

AGVIQ-CH2M HILL subcontractors will be required to provide AHAs specific to their scope of work on the project for acceptance by the SSHO, AGVIQ-CH2M HILL Program CIH or HSPA or other designated qualified safety professional associated with AGVIQ-CH2M HILL. Each subcontractor will submit AHAs for their field activities, as defined in their work plan/scope of work, along with their project-specific APP. Additions or changes in AGVIQ-CH2M HILL or subcontractor field activities, equipment, tools or material to perform work, or additional/ different hazard encountered that require additional/ different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

The AHA applicable to the current site operation(s), work phase or safety sensitive function must remain posted in a conspicuous place (project construction trailer, weather proof bulletin board, etc.) that all site or facility personnel can access. When the most current AHA is not in use and not required to be posted, these completed AHAs shall be filed on site in a neat and organized manner for review are kept onsite in a neat and organized manner for review by NAVFAC Points of Contact (POCs) or the AGVIQ-CH2M HILL project management or program management team, or health and safety representatives, if requested.

At the end of project operations, all completed hard copies of AHAs are included in the final project record.

**Table 10-1 of Section 10.6**, below summarizes identified hazards associated with the phases of work anticipated with the project execution. Table 10-1 provides the basis for the development of AHA documents included in Section 10.6 of this APP. **Section 10.6** of this APP contains applicable AHA documents that must be implemented during the execution of this TO. These AHAs, in addition to the content of this APP, are intended to reinforce project or program requirements and present project control measures for anticipated or encountered hazards that may occur during the execution of an employee's assigned tasks. Any changes in site conditions or processes, AHA must be updated prior to work proceeding.

## 10.2 Pre-Task Safety Plans

Daily safety meetings are held with all designated project site personnel in attendance to review the potential hazards that may be associated with daily work assignments. These meetings set forth various hazard control measures or policies, procedures or requirements that must be implemented by project staff to reduce or eliminate workplace incidents that could be associated with daily scheduled work. The topics developed and delivered during each production day safety meeting are documented on an AGVIQ-CH2M HILL PTSP planner. The PTSPs are held between the site line supervisor and work crews and are designed to focus on eliminating identified hazards associated with daily assigned work. An example PTSP is included in **Attachment 8** of this APP.

Daily safety topics typically include task-specific or site hazards and associated hazard control measures, health and safety processes, or “hazardous conditions” discovered and corrected and/or controlled during a previous work event that may still be applicable to the current daily production goals. Additionally, names of personnel, types of tools and equipment that will be used to perform the assigned daily task(s) are listed, along with the hazards posed and required health and safety procedures that have been identified in the task specific AHAs or the APP and are incorporated into each PTSP.

Preparation and delivery of the PTSP may be delegated to the SSHO by the site supervisor/field team leader (FTL) to facilitate site operations. At the start of each day’s activities, the line supervisor or SSHO completes a PTSP. Ideally, input from the work crew is solicited and integrated into the development and delivery of each PTSP. Implementing daily PTSPs enhances worker participation in the recognition and control of hazardous site conditions or undesirable site acts, while reinforcing the task-specific required H&S procedures with the crew each work day. In the event that more than one type of project task is scheduled in any one daily production event, multiple PTSPs may need to be completed and implemented.

After the delivery of each PTSP, all personnel in attendance at the daily safety meeting acknowledge the delivered material with the addition of their printed names, signatures, and the date on which the material was delivered to them on the last page of the form. Completed PTSPs are kept on site in a neat and organized manner for review by management or the client, as deemed necessary.

Completed PTSPs are kept onsite in a neat and organized manner for review by NAVFAC POCs or the AGVIQ-CH2M HILL project management or program management team, or health and safety representatives, if requested. The project manager and the site line supervisor may establish a process by which these completed PTSPs are scanned and emailed for inclusion in the electronic project file, where email communication capability is available. Where email capability is not available other suitable distribution methods shall be arranged between the overall project manager and the site supervisor/FTL.

At the end of the project or facility operations, all completed PTSP hard copies are included in the final project record.

After the delivery of each PTSP, all personnel in attendance of the daily safety meeting shall acknowledge the delivered material with the addition of their printed name, signature and date that the material was delivered to them on the last page of the form. These completed PTSPs shall be kept onsite in a neat and organized manner for review by management or project Owner, as deemed necessary.

The use of safety meetings via the use of a PTSP or other similar format is a common safety practice in the construction industry.

## 10.3 Loss Prevention Observations

A LPO is a tool to be used by management, site supervisors/FTLs, and SSHOs to determine whether workplace behaviors, acts, and conditions are consistent with established H&S procedures, project site-specific APP requirements, or other established health and safety standards. An LPO may also be completed by an individual work crew member to initiate necessary corrective actions, to identify a work crew member's positive performance or contribution, or to report an undesirable act that would endanger the employee or other co-workers or result in a loss. Completion of the LPO provides a mechanism for management to reinforce positive actions for work practices performed correctly, while also identifying and eliminating work procedures, site conditions, or behaviors that could result in eventual losses.

LPOs can be completed by any employee involved with or observing site operations, but are typically prepared by the site supervisor/FTL, SSHO, or project manager using the LPO form found in **Attachment 9** of this APP. The LPO is implemented as a comparison of the actual execution of work process observed against established work procedures identified in the project-specific APP, AHAs, established health and safety policies and procedures, or regulatory standards.

One LPO shall be completed weekly and forwarded to the overall AGVIQ-CH2M HILL Project Manager and their designated management team, the CH2M HILL Administrative Assistant designated to track project labor hours and completed LPO, as well as the designated project HSPA lead where email capability is available. Where email capability is not available other suitable distribution methods shall be arranged between the overall project manager and the site supervisor. When severe or critical deficiencies are observed by the LPO process, the project manager, site supervisor/FTL, or SSHO has a duty to notify the project manager and Chain of Command personnel of the condition for further review and development of corrective action requirements.

Completed LPOs are kept onsite in a neat and organized manner for review by management or NAVFAC, as deemed necessary. At the end of the project or facility operations, all completed LPO hard copies are included in the final project record.

### 10.3.1 Deficiency Tracking System

On NAVFAC contracts where adherence to the US Army Corps of Engineers' EM 385-1-1, "Safety and Health Requirements Manual" is required in addition to Occupational Safety & Health Administration (OSHA) regulations, the site supervisor is responsible for ensuring that the a "Deficiency Tracking System" or log is maintained. The deficiency tracking system is used to identify and monitor the status of safety and health "deficiencies" observed at the project-specific location, in chronological order. The deficiency tracking system includes the following information:

- Date deficiency identified
- Description of deficiency
- Name of person responsible for correcting deficiency
- Projected resolution date
- Date actually resolved

The deficiency tracking system or log is posted on a project bulletin board or other conspicuous place commonly accessed by project or facility personnel, updated daily, and available for review by the NAVFAC POCs or by AGVIQ-CH2M HILL Project Management, Senior Management or Health and Safety Representatives. At project or facility sites where the use of a Deficiency Tracking System is required, this log supplements the LPO process.

At the end of the project, or when facility operations are completed, hard copies of the deficiency tracking system data or logs are included in the final record.

## 10.4 Loss/Near-Loss Investigations

Loss and Near Loss Incident investigations are detailed in Section 8.0 “Accident Reporting and Investigation” of this APP and will not be further elaborated upon in this section. Incident reporting and investigation forms are included in **Attachment 10** of this APP.

## 10.5 Drug-Free Workplace Program

AGVIQ-CH2M HILL does not tolerate illegal drugs, or any use of drugs, controlled substances, or alcohol that impairs an employees work performance or behavior. AGVIQ-CH2M HILL has established a policy that its employees and subcontractors will not be involved in any manner with the unlawful manufacture, distribution, dispensation, possession, sale, or use of illegal drugs in the workplace. The use or possession of alcohol in the workplace is also prohibited. Any violation of these prohibitions may result in discipline or immediate discharge.

## 10.6 Project Specific Activity Hazard Analyses

Applicable project Activity Hazard Analysis (AHA) documents for each major phase of work anticipated for this contract are contained below. It is the intent of these AHAs to reinforce project or program requirements and present project control measures for anticipated or encountered hazards that may occur during the execution of an employee’s assigned tasks.

Table 10-1 below summarizes identified hazards associated with the phases of work anticipated with work scheduled at site 4A. Table 10-1 provides only the basis for the development of Activity Hazard Analysis documents, which must be implemented as part of the AGVIQ-CH2M HILL Health and Safety Program, BBLPS and overall RMP.

TABLE 10-1: ACTIVITY HAZARD ANALYSIS BASIS				
PROJECT HAZARDS	PROJECT ACTIVITIES			
	Mobilization, Site Preparation, and Utility Clearance	Biofilter Pilot Study	Site Cleanup and Restoration	Decontamination and Demobilization
Adverse Weather	X	X	X	X
Air Compressors				
Biological	X	X	X	X
Buried Utilities		X		
Brush cutters				
Chemical Exposure		X	X	X
Concrete and Masonry				
Confined Space				
Cuts/Abrasions	X	X	X	X
Cranes				
Dismantling				
Dredging				
Drilling/DPT				
Electrical Safety	X	X	X	X
Excavations		X		
Fall Prevention		X		
Fire/Explosion Prevention	X	X	X	X
Hand & Power Tools	X	X		X
Haul Truck Operations	X			
Heat Stress/Cold Stress	X	X	X	X
Heavy Equipment		X		
Housekeeping	X	X	X	X
Land Clearing				
Lockout /Tagout		X		
Manual Lifting	X	X	X	X
MEC/MPPEH				
Noise	X	X	X	X
Overhead Utilities	X	X	X	
Pinch/Struck by/Caught	X	X	X	X
Powered Industrial Trucks		X		
Pressure Washing Activities				X
Pressurized Lines				
Rigging or Material Handling		X		
Sample Handling		X		
Slips/Trips/Falls	X	X	X	X
Stairways & Ladders				
Vacuum Truck				
Vehicle Traffic / Driving	X	X	X	X
Visible Lighting	X	X	X	X
Welding and cutting				
Working Alone				
Working over water				

Section 10.6 (continued)  
Project Activity Hazard Analyses (AHAs)

## ACTIVITY HAZARD ANALYSIS

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Mobilization, Site Preparation, and Utility Clearance	
6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
12. Personal Protective Clothing and Equipment: Level D PPE D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
Mobilizing personnel and equipment	Preparedness	<ul style="list-style-type: none"> <li>• Verify that EMS services are available and can respond in a prompt manner prior to the start of work.</li> <li>• Base or Local Emergency medical Service and Fire Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>• Buddy System maintained for all phases of work.</li> </ul>	L
	Adverse Weather	<ul style="list-style-type: none"> <li>• Frequently observe the skyline for rain squalls and thunder storms systems that may develop.</li> <li>• Bring clothing suitable for anticipated daily weather conditions.</li> <li>• Shut down operations during heavy rain/lightning events or high wind conditions. For storms producing lightning, seek safe haven in a grounded structure or rubber vehicle. Implement 30 – 30 rule. Do not seek refuge under trees during electrical or high wind storm events.</li> <li>• Do not use telephones during electrical storms, except in the case of emergency.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>• Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>• Avoid exposure to blood borne pathogens if first aid must be provided. Use universal precautions against exposure to blood borne pathogens.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges or hand tools.</li> <li>• Avoid use of razor knives.</li> <li>• When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L
	Driving	<ul style="list-style-type: none"> <li>• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> </ul>	L
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L

### ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Mobilization, Site Preparation, and Utility Clearance</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	

**12. Personal Protective Clothing and Equipment: Level D PPE**  
 D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection

**13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.**

**14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.**

Job Steps	Hazards	Controls	Overall RAC
	Haul Trucks	<ul style="list-style-type: none"> <li>• Haul truck operators should ensure all persons are clear before operating trucks or equipment. Before moving, operators should sound horn/back-up alarm. All equipment should be equipped with an operational backing alarm.</li> <li>• Haulage trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots or a spotter must be provided.</li> <li>• Employees should stay off haul roads. When approaching a haul area, employees should make eye contact and communicate their intentions directly with the equipment operator.</li> <li>• All haul trucks must following the designated Haul Route established for the project site.</li> </ul>	L
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➤ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➤ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non- caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Mobilization, Site Preparation, and Utility Clearance</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	

**12. Personal Protective Clothing and Equipment: Level D PPE**  
 D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection

**13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.**

**14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.**

Job Steps	Hazards	Controls	Overall RAC: L
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments or in open cabs of heavy equipment or adjacent to operating heavy equipment shall wear hearing protection.</li> </ul>	L
	Overhead Utilities	<ul style="list-style-type: none"> <li>• Maintain proper separation between Power Transmission Lines and over overhead utilities during the operation of heavy equipment or haul truck deliveries.</li> <li>• Be cognizant of utility pole guy wire positions during haul truck deliveries.</li> </ul>	L
	Pinched/Struck-by/ Caught-in-between	<ul style="list-style-type: none"> <li>• Sufficient separation between ground support personnel and any operating heavy equipment must be maintained.</li> <li>• Wear reflective vests or high visibility clothing to promote visibility of ground personnel for equipment operators.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>• Ground personnel shall avoid positioning themselves between fixed objects, operating equipment.</li> <li>• Make/maintain eye contact with operators before approaching equipment.</li> <li>• Do not approach equipment from rear or from blind spot of operator.</li> <li>• Stay out of the swing radius of operating heavy equipment.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>• Ensure equipment has operable back-up alarms.</li> <li>• Step away from heavy equipment when adjustments (positioning) are made.</li> <li>• Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>• Ensure that all ground personnel have sufficient separation from tub grinding operations.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L

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6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
12. Personal Protective Clothing and Equipment: Level D PPE D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
	Other	<ul style="list-style-type: none"> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	L
Establishing a decontamination area	Adverse Weather	<ul style="list-style-type: none"> <li>Frequently observe the skyline for rain squalls and thunder storms systems that may develop.</li> <li>Bring clothing suitable for anticipated daily weather conditions.</li> <li>Shut down operations during heavy rain/lightning events or high wind conditions. For storms producing lightning, seek safe haven in a grounded structure or rubber vehicle. Implement 30 – 30 rule. Do not seek refuge under trees during electrical or high wind storm events.</li> <li>Do not use telephones during electrical storms, except in the case of emergency.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>Avoid exposure to blood borne pathogens if first aid must be provided. Use universal precautions against exposure to blood borne pathogens.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges or hand tools.</li> <li>Avoid use of razor knives.</li> <li>When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L
	Driving	<ul style="list-style-type: none"> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> </ul>	L
	Electric Safety	<ul style="list-style-type: none"> <li>Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>Inspect all electrical power circuits are sufficient prior to connection.</li> <li>If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Fire Prevention	<ul style="list-style-type: none"> <li>Use only metal safety cans for storage and transfer of fuel.</li> <li>Use funnels and nozzles during fueling operations.</li> <li>Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>Select and use the proper tool for the task.</li> <li>Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L

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<b>12. Personal Protective Clothing and Equipment: Level D PPE</b> D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection			
<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b> <b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			<b>Overall RAC: L</b>
Job Steps	Hazards	Controls	RAC
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non-caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast— be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift— especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments or in open cabs of heavy equipment or adjacent to operating heavy equipment shall wear hearing protection.</li> </ul>	L
	Overhead Utilities	<ul style="list-style-type: none"> <li>• Maintain proper separation between Power Transmission Lines and over overhead utilities during the operation of heavy equipment or haul truck deliveries.</li> <li>• Be cognizant of utility pole guy wire positions during haul truck deliveries.</li> </ul>	L

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<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b> <b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			<b>Overall RAC: L</b>
Job Steps	Hazards	Controls	RAC
	Pinched/Struck-by/ Caught-in-between	<ul style="list-style-type: none"> <li>• Sufficient separation between ground support personnel and any operating heavy equipment must be maintained.</li> <li>• Wear reflective vests or high visibility clothing to promote visibility of ground personnel for equipment operators.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>• Ground personnel shall avoid positioning themselves between fixed objects, operating equipment.</li> <li>• Make/maintain eye contact with operators before approaching equipment.</li> <li>• Do not approach equipment from rear or from blind spot of operator.</li> <li>• Stay out of the swing radius of operating heavy equipment.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>• Ensure equipment has operable back-up alarms.</li> <li>• Step away from heavy equipment when adjustments (positioning) are made.</li> <li>• Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>• Ensure that all ground personnel have sufficient separation from tub grinding operations.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
	Other	<ul style="list-style-type: none"> <li>• Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	L
Utility survey of trench sites	Adverse Weather	<ul style="list-style-type: none"> <li>• Frequently observe the skyline for rain squalls and thunder storms systems that may develop.</li> <li>• Bring clothing suitable for anticipated daily weather conditions.</li> <li>• Shut down operations during heavy rain/lightning events or high wind conditions. For storms producing lightning, seek safe haven in a grounded structure or rubber vehicle. Implement 30 - 30 rule. Do not seek refuge under trees during electrical or high wind storm events.</li> <li>• Do not use telephones during electrical storms, except in the case of emergency.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>• Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>• Avoid exposure to blood borne pathogens if first aid must be provided. Use universal precautions against exposure to blood borne pathogens.</li> </ul>	L

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Job Steps	Hazards	Controls	RAC
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges or hand tools.</li> <li>• Avoid use of razor knives.</li> <li>• When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non- caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L

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Job Steps	Hazards	Controls	RAC
	Manual Lifting	<ul style="list-style-type: none"> <li>AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
	Other	<ul style="list-style-type: none"> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	L

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> <li>Fire extinguisher (with fuel and electrical sources)</li> <li>Eye wash (small portable type)</li> <li>Miscellaneous power and manual hand tools.</li> <li>First Aid/BbPK/CPR shield</li> <li>Spill Kit</li> <li>Communication devices</li> </ul>	<ul style="list-style-type: none"> <li>Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>Emergency Response equipment Inspections (Fire Extinguishers, Eye wash First Aid/CPR etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Review APP for new site personnel.</li> <li>1<sup>st</sup> Aid/CPR 1<sup>st</sup> Aid/CPR (2 per site when medical attention a medical facility or physician is more than 5 minutes away to two or more employees.</li> <li>Supervisors - BBLPS, SC-HW, 10 hour OSHA Construction Safety Training or equivalent</li> </ul>

NOTES (Field Notes, Review Comments, etc.):

Overall Risk Assessment Code (RAC) (Use highest code)					
Risk Assessment Code (RAC) Matrix					
Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				E = Extremely High Risk	
				H = High Risk	
				M = Moderate Risk	
				L = Low Risk	

**Probability:** Likelihood of the hazard to cause an incident, near miss, or accident.

- Frequent - Occurs very often, known to happen regularly
- Likely - Occurs several times, a common occurrence
- Occasional - Occurs sporadically, but is not uncommon
- Seldom - Remotely possible, could occur at some time
- Unlikely - Can assume will not occur, but not impossible

**Severity:** Outcome/degree of the incident, near miss, or accident.

- Catastrophic - Death or permanent total disability; Major property damage
- Critical - Permanent partial disability or temporary total disability; Extensive damage to equipment or systems
- Marginal - Lost workdays due to injury or illness; Minor damage to equipment or systems, property, or the environment
- Negligible - First aid or minor medical treatment; Slight equipment or system damage, but fully functional or serviceable; Little or no property or environmental damage

PRINT

SIGNATURE

Date/Time

Supervisor Name: \_\_\_\_\_

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SSHO Name: \_\_\_\_\_

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**SITE PERSONNEL**

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## ACTIVITY HAZARD ANALYSIS

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Biofilter Pilot Study	
6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are Limited to Hands Only			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
Biofilter Materials Preparation	Preparedness	<ul style="list-style-type: none"> <li>• Verify that EMS services are available and can respond in a prompt manner prior to the start of work.</li> <li>• Base or Local Emergency medical Service and Fire Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>• Buddy System maintained for all phases of work.</li> </ul>	L
	Adverse Weather	<ul style="list-style-type: none"> <li>• Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>• Frequently observe the skyline for developing rain squalls and thunder storms systems that may develop.</li> <li>• Bring clothing suitable for anticipated daily weather conditions.</li> <li>• Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 - 30 rule.</li> <li>• Do not use telephones during electrical storms, except in the case of emergency.</li> <li>• Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L
	Buried Objects	<ul style="list-style-type: none"> <li>• Contact <b>Sunshine State One Call of Florida, Inc.</b> to secure a utility owner verification request number at <b>(800) 432-4770</b> for utility clearance verification. Keep copies of any written documentation (faxes, email printouts) regarding utility location verification provided by utilities owners in the office project file and in a working field file onsite.</li> <li>• <b>Update the utility verification request numbers as required. Include written responses to updated request verifications in the project file as verification the update was completed.</b></li> <li>• Photo document owner provided field utility mark-outs as related to proposed limits of ground disturbing activities prior to the start of work.</li> <li>• Conduct "third" party utility clearance when the locations of utilities may be in question and document results of third party utility location.</li> <li>• Update NAVFAC "Excavator Permit" as required.</li> <li>• Hand dig around identified utilities (within 5') or as otherwise required by the issued excavation permit.</li> <li>• Review base engineering records or drawings against utility owner or third party utility mark-out to verify any potential differences.</li> <li>• Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, utilities must be relocated/marked.</li> <li>• Where unknown or unanticipated buried objects are encountered (i.e., drums, tanks, cylinders, munitions of explosive concern, soil with unusual staining or odor) AGVIQ-CH2M HILL JV or subcontractor personnel shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Notify AGVIQ-CH2M HILL JV PM and program officials and applicable NAVFAC POCs and do not resume work until authorized to do so.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Biofilter Pilot Study</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	

**12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE**  
 Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are **Limited to Hands Only**

**13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.**

**14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.**

**Overall  
RAC: L**

Job Steps	Hazards	Controls	RAC
	Biological	<ul style="list-style-type: none"> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>• Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>• Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges of loads or rigging.</li> <li>• Keep fingers/hands/arms out of potential pinch points of rigging and loads.</li> <li>• Avoid use of razor knives.</li> <li>• When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.                             <ul style="list-style-type: none"> <li>1) <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul> </li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)</b>		<b>2. Contract Number: N62470-08-D-1006</b>	
		<b>3. Contract Task Order Number: JM19</b>	
<b>4. Project Location: Whiting Field Site 4</b>		<b>5. Job/Task: Biofilter Pilot Study</b>	
<b>6. Prepared By: Josh Painter</b>	<b>8. Reviewed By:</b>	<b>10. Modified By:</b>	
<b>7. Date Prepared: 3/5/14</b>	<b>9. Date Reviewed:</b>	<b>11. Date Modified:</b>	
<b>12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE</b> Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are <b>Limited to Hands Only</b>			
<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>			<b>Overall RAC: L</b>
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			
Job Steps	Hazards	Controls	RAC
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non-caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments or in open cabs of heavy equipment or adjacent to operating heavy equipment shall wear hearing protection.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
Excavation and Backfill	Adverse Weather	<ul style="list-style-type: none"> <li>• Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>• Frequently observe the skyline for developing rain squalls and thunder storms systems that may develop.</li> <li>• Bring clothing suitable for anticipated daily weather conditions.</li> <li>• Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 – 30 rule.</li> <li>• Do not use telephones during electrical storms, except in the case of emergency.</li> <li>• Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Biofilter Pilot Study</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	
<b>12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE</b> Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are <b>Limited to Hands Only</b>	
<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>Overall RAC: L</b>	

Job Steps	Hazards	Controls	RAC
	Buried Objects	<ul style="list-style-type: none"> <li>• Contact <b>Sunshine State One Call of Florida, Inc.</b> to secure a utility owner verification request number at (800) 432-4770 for utility clearance verification. Keep copies of any written documentation (faxes, email printouts) regarding utility location verification provided by utilities owners in the office project file and in a working field file onsite.</li> <li>• <b>Update the utility verification request numbers as required. Include written responses to updated request verifications in the project file as verification the update was completed.</b></li> <li>• Photo document owner provided field utility mark-outs as related to proposed limits of ground disturbing activities prior to the start of work.</li> <li>• Conduct "third" party utility clearance when the locations of utilities may be in question and document results of third party utility location.</li> <li>• Update NAVFAC "Excavator Permit" as required.</li> <li>• Hand dig around identified utilities (within 5') or as otherwise required by the issued excavation permit.</li> <li>• Review base engineering records or drawings against utility owner or third party utility mark-out to verify any potential differences.</li> <li>• Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, utilities must be relocated/marked.</li> <li>• Where unknown or unanticipated buried objects are encountered (i.e., drums, tanks, cylinders, munitions of explosive concern, soil with unusual staining or odor) AGVIQ-CH2M HILL JV or subcontractor personnel shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Notify AGVIQ-CH2M HILL JV PM and program officials and applicable NAVFAC POCs and do not resume work until authorized to do so.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>• Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>• Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Chemical Exposure	<ul style="list-style-type: none"> <li>• All personnel performing this task shall be trained and enrolled in a medical surveillance program in accordance with 29CFR1910.120.</li> <li>• Do not allow dermal contact or incidental ingestion of impacted soil/sediment or water.</li> <li>• Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or water) without first donning proper PPE.</li> <li>• Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Shower as soon as possible after leaving the site.</li> <li>• Only eat, drink, smoke or chew tobacco in designated areas.</li> <li>• Adhere to PPE and action monitoring requirements identified in Tables 1-1 and 1-2 respectively of <b>Attachment 1 of the APP, Site Safety and Health Plan</b> of the APP.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges of loads or rigging.</li> <li>• Keep fingers/hands/arms out of potential pinch points of rigging and loads.</li> <li>• Avoid use of razor knives.</li> <li>• When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)		<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>	
<b>4. Project Location: Whiting Field Site 4</b>		<b>5. Job/Task: Biofilter Pilot Study</b>	
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>	<b>10. Modified By:</b> <b>11. Date Modified:</b>	
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<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>			<b>Overall RAC: L</b>
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			
Job Steps	Hazards	Controls	RAC
	Excavation	<ul style="list-style-type: none"> <li>▪ An excavation competent person shall inspect the excavation every day and after everyday hazard increasing event. If evidence of a situation that could result in possible cave-ins, slides, failure of protective systems, hazardous atmospheres, or other hazardous condition is identified, exposed workers shall be removed from the hazard and all work stopped until necessary safety precautions have been implemented. No personnel entry into excavations is permitted. Documentation of this inspection must be maintained and recorded on the Daily Contractor Production Report and available as part of the project record. Documentation should be available on-site for inspection.</li> <li>• Provide Excavation Perimeter Protection and Warning signs as necessary to be in compliance with EM 385 11-1, Section 25B Safe Access and Appendix Q, "Perimeter Protection".</li> </ul>	L
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	Heavy equipment use	<ul style="list-style-type: none"> <li>▪ Only certified operators will be authorized to operate equipment. Certifications must be on site at all times.</li> <li>▪ High visibility vests will be worn at all times while working in or around heavy equipment.</li> <li>▪ All ground personal must maintain eye contact with operators at all times when approaching equipment. Do not proceed toward, or into blind spots of equipment without authorization to do so by operator.</li> <li>• All ground personal will stay outside the swing radius of equipment while in operation.</li> </ul>	L
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• 1) <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non- caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L

### ACTIVITY HAZARD ANALYSIS

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Biofilter Pilot Study	
6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
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13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			
Job Steps	Hazards	Controls	RAC
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments or in open cabs of heavy equipment or adjacent to operating heavy equipment shall wear hearing protection.</li> </ul>	L
	Overhead Utilities	<ul style="list-style-type: none"> <li>• Maintain proper separation between Power Transmission Lines and over overhead utilities during the operation of heavy equipment or haul truck deliveries.</li> <li>• Be cognizant of utility pole guy wire positions during haul truck deliveries.</li> </ul>	L
	Pinched/Struck -by/ Caught-in-between	<ul style="list-style-type: none"> <li>• Sufficient separation between ground support personnel and any operating heavy equipment must be maintained.</li> <li>• Wear reflective vests or high visibility clothing to promote visibility of ground personnel for equipment operators.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>• Ground personnel shall avoid positioning themselves between fixed objects, operating equipment.</li> <li>• Make/maintain eye contact with operators before approaching equipment.</li> <li>• Do not approach equipment from rear or from blind spot of operator.</li> <li>• Stay out of the swing radius of operating heavy equipment.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>• Ensure equipment has operable back-up alarms.</li> <li>• Step away from heavy equipment when adjustments (positioning) are made.</li> <li>• Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>• Ensure that all ground personnel have sufficient separation from tub grinding operations.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)</b>		<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>	
<b>4. Project Location: Whiting Field Site 4</b>		<b>5. Job/Task: Biofilter Pilot Study</b>	
<b>6. Prepared By: Josh Painter</b>	<b>8. Reviewed By:</b>	<b>10. Modified By:</b>	
<b>7. Date Prepared: 3/5/14</b>	<b>9. Date Reviewed:</b>		
<b>12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE</b> Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are Limited to Hands Only			
<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>			<b>Overall RAC: L</b>
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			
Job Steps	Hazards	Controls	RAC
Biofilter Piping/Materials Installation Final Piping Connections Blower Connections	Adverse Weather	<ul style="list-style-type: none"> <li>• Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>• Frequently observe the skyline for developing rain squalls and thunder storms systems that may developing.</li> <li>• Bring clothing suitable for anticipated daily weather conditions.</li> <li>• Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 - 30 rule.</li> <li>• Do not use telephones during electrical storms, except in the case of emergency.</li> <li>• Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>• Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>• Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges of loads or rigging.</li> <li>• Keep fingers/hands/ arms out of potential pinch points of rigging and loads.</li> <li>• Avoid use of razor knives.</li> <li>• When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	Haul Trucks	<ul style="list-style-type: none"> <li>• Haul truck operators should ensure all persons are clear before operating trucks or equipment. Before moving, operators should sound horn/back-up alarm. All equipment should be equipped with an operational backing alarm.</li> <li>• Haulage trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots or a spotter must be provided.</li> <li>• Employees should stay off haul roads. When approaching a haul area, employees should make eye contact and communicate their intentions directly with the equipment operator.</li> <li>• All haul trucks must following the designated Haul Route established for the project site.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Biofilter Pilot Study	
6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are Limited to Hands Only			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non- caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast— be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Biofilter Pilot Study</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
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<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>Overall RAC: L</b>	

Job Steps	Hazards	Controls	RAC
	Lockout/tagout (of hazardous energy sources)	<ul style="list-style-type: none"> <li>• Verify that subcontractors affected by the unexpected operation of equipment develop a written lockout/tagout program, provide training on lockout/tagout procedures and coordinate its program with other affected subcontractors. This may include compliance with the owner or facility lockout/tagout program.</li> <li>• Ensure effected personnel receive electrical safety awareness training. Authorized personnel shall inform the affected personnel of the LO/TO. Affected personnel shall not tamper with LO/TO devices.</li> <li>• Standard lockout/tagout procedures include the following six steps: 1) notify all personnel in the affected area of the lockout/tagout, 2) shut down the equipment using normal operating controls, 3) isolate all energy sources, 4) apply individual lock and tag to each energy isolating device, 5) relieve or restrain all potentially hazardous stored or residual energy, and 6) verify that isolation and deenergization of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin.</li> <li>• All safe guards must be put back in place, all affected personnel notified that lockout has been removed and controls positioned in the safe mode prior to lockout removal. Only the individual who applied the lock and tag may remove them.</li> <li>• Authorized employees shall complete the LO/TO training and either the electrical safety training or 10-hour construction training. The authorized employee must also be trained and qualified on the system they are working on (e.g., qualified electrician for working on electrical components of a system).</li> <li>• When equipment-specific LO/TO procedures are not available or when existing procedures are determined to be insufficient, authorized employees shall also complete the Equipment-Specific LO/TO Procedure Development Form, provided as an attachment to this HSP, to create an equipment-specific lockout/tagout procedure. Only trained personnel may apply lockout/tagout devices.</li> <li>• Follow Section 9.7.22 Lockout/Tagout of this APP.</li> <li>• After lockouts/tagouts are applied, check to ensure the system is deenergized.</li> </ul>	M
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Material Handling	<ul style="list-style-type: none"> <li>• Only load rated (tagged or labeled) rigging shall be utilized on AGVIQ-CH2MHILL projects. User shall familiarize themselves with design load rate capacities (i.e., vertical, basket/cradle or choker applications) for the selected rigging.</li> <li>• Any lifted loads shall have a tag line and so that there shall be no contact between the live load and personnel.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing material handling operations.</li> <li>• Any rigging used to unload/load turbidity boom shall be inspected before use.</li> <li>• Suspended loads shall not be passed over ground personnel.</li> <li>• Ground personnel shall not walk under or in front of suspended loads.</li> </ul>	L
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments or in open cabs of heavy equipment or adjacent to operating heavy equipment shall wear hearing protection.</li> </ul>	L
	Overhead Utilities	<ul style="list-style-type: none"> <li>• Maintain proper separation between Power Transmission Lines and over overhead utilities during the operation of heavy equipment or haul truck deliveries.</li> <li>• Be cognizant of utility pole guy wire positions during haul truck deliveries.</li> </ul>	L

### ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Biofilter Pilot Study</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	
<b>12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE</b> Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are <b>Limited to Hands Only</b>	
<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>Overall RAC: L</b>	

Job Steps	Hazards	Controls	RAC
	Pinched/Struck -by/ Caught-in-between	<ul style="list-style-type: none"> <li>• Sufficient separation between ground support personnel and any operating heavy equipment must be maintained.</li> <li>• Wear reflective vests or high visibility clothing to promote visibility of ground personnel for equipment operators.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>• Ground personnel shall avoid positioning themselves between fixed objects, operating equipment.</li> <li>• Make/maintain eye contact with operators before approaching equipment.</li> <li>• Do not approach equipment from rear or from blind spot of operator.</li> <li>• Stay out of the swing radius of operating heavy equipment.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>• Ensure equipment has operable back-up alarms.</li> <li>• Step away from heavy equipment when adjustments (positioning) are made.</li> <li>• Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>• Ensure that all ground personnel have sufficient separation from tub grinding operations.</li> </ul>	L
	Powered Industrial Trucks	<ul style="list-style-type: none"> <li>• A rated lifting capacity must be posted in a location readily visible to the operator.</li> <li>• A forklift truck must not be used to elevate employees unless a platform with guardrails, a back guard, and a kill switch is provided on the vehicle. When guardrails are not possible, fall arrest protection is required.</li> <li>• The subcontractor operating the forklift must post and enforce a set of operating rules for forklift trucks.</li> <li>• Only certified forklift operators shall operate forklifts.</li> <li>• Stunt driving and horseplay are prohibited.</li> <li>• Employees must not ride on the forks.</li> <li>• Employees must never be permitted under the forks (unless forks are blocked).</li> <li>• The driver must inspect the forklift once a shift and document this inspection.</li> <li>• The operator must look in the direction of travel and must not move the vehicle until all persons are clear of the vehicle.</li> <li>• Forks must be carried as low as possible.</li> <li>• The operator must lower the forks, shut off the engine, and set the brakes (or block the wheels) before leaving the forklift operator's position unless maintenance or safety inspections require the forklift to be running.</li> <li>• Trucks must be blocked and have brakes set when forklifts are driven onto their beds.</li> <li>• Extreme care must be taken when tilting elevated loads.</li> <li>• Every forklift must have operable brakes capable of safely stopping it when fully loaded.</li> <li>• Forklifts must have parking brakes and an operable horn.</li> <li>• When the operator is exposed to possible falling objects, industrial trucks must be equipped with overhead protection (canopy).</li> <li>• Forklifts must be inspected and documented daily using the forklift inspection form.</li> </ul>	L

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13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			
Job Steps	Hazards	Controls	RAC
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
Background Flux Sampling First Month Monitoring and Maintenance Ninety Day Biofilter Assessment Long Term Biofilter Assessment	Adverse Weather	<ul style="list-style-type: none"> <li>Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>Frequently observe the skyline for developing rain squalls and thunder storms systems that may develop.</li> <li>Bring clothing suitable for anticipated daily weather conditions.</li> <li>Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 - 30 rule.</li> <li>Do not use telephones during electrical storms, except in the case of emergency.</li> <li>Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained and enrolled in a medical surveillance program in accordance with 29CFR1910.120.</li> <li>Do not allow dermal contact or incidental ingestion of impacted soil/sediment or water.</li> <li>Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or water) without first donning proper PPE.</li> <li>Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Shower as soon as possible after leaving the site.</li> <li>Only eat, drink, smoke or chew tobacco in designated areas.</li> <li>Adhere to PPE and action monitoring requirements identified in Tables 1-1 and 1-2 respectively of Attachment 1 of the APP, Site Safety and Health Plan of the APP.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges of loads or rigging.</li> <li>Keep fingers/hands/arms out of potential pinch points of rigging and loads.</li> <li>Avoid use of razor knives.</li> <li>When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>Select and use the proper tool for the task.</li> <li>Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
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<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>	
<b>Overall RAC: L</b>	

Job Steps	Hazards	Controls	RAC
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.                              1) <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i> </li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non-caffeinated fluids to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Sample Handling	<ul style="list-style-type: none"> <li>• All personnel performing this task shall be trained and enrolled in a medical surveillance program in accordance with 29CFR1910.120.</li> <li>• Do not allow dermal contact or incidental ingestion of impacted soil/sediment or water.</li> <li>• Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or water) without first donning proper PPE.</li> <li>• Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Shower as soon as possible after leaving the site.</li> <li>• Only eat, drink, smoke or chew tobacco in designated areas.</li> <li>• Adhere to PPE and action monitoring requirements identified in Tables 1-1 and 1-2 respectively of <b>Attachment 1 of the APP, Site Safety and Health Plan</b> of the APP.</li> <li>• Caution should be exercised when filling bottles containing acid or base preservatives. Both liquid and vapor phases of acid can cause severe burns.</li> <li>• Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents. Sample activities, sample collection, and equipment decontamination procedures.</li> <li>• Properly contain and label all decontamination solutions used for the cleaning of sampling equipment and tools.</li> <li>• Review applicable MSDS information.</li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Biofilter Pilot Study	
6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are Limited to Hands Only			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
System Startup	Adverse Weather	<ul style="list-style-type: none"> <li>• Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>• Frequently observe the skyline for developing rain squalls and thunder storms systems that may develop.</li> <li>• Bring clothing suitable for anticipated daily weather conditions.</li> <li>• Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 - 30 rule.</li> <li>• Do not use telephones during electrical storms, except in the case of emergency.</li> <li>• Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>• Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>• Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Chemical Exposure	<ul style="list-style-type: none"> <li>• All personnel performing this task shall be trained and enrolled in a medical surveillance program in accordance with 29CFR1910.120.</li> <li>• Do not allow dermal contact or incidental ingestion of impacted soil/sediment or water.</li> <li>• Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or water) without first donning proper PPE.</li> <li>• Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Shower as soon as possible after leaving the site.</li> <li>• Only eat, drink, smoke or chew tobacco in designated areas.</li> <li>• Adhere to PPE and action monitoring requirements identified in Tables 1-1 and 1-2 respectively of Attachment 1 of the APP, Site Safety and Health Plan of the APP.</li> </ul>	L
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/ampereage of equipment.</li> </ul> </li> </ul>	M

### ACTIVITY HAZARD ANALYSIS

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Biofilter Pilot Study	
6. Prepared By: Josh Painter 7. Date Prepared: 3/5/14	8. Reviewed By: 9. Date Reviewed:	10. Modified By: 11. Date Modified:	
12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are Limited to Hands Only			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments or in open cabs of heavy equipment or adjacent to operating heavy equipment shall wear hearing protection.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
<ul style="list-style-type: none"> <li>• Fire extinguisher (with fuel and electrical sources)</li> <li>• Eye wash (small portable type)</li> <li>• Miscellaneous power and manual hand tools.</li> <li>• First Aid/BbPK/CPR shield</li> <li>• Spill Kit</li> <li>• Forklift</li> <li>• Communication devices</li> </ul>	<ul style="list-style-type: none"> <li>• Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>• Emergency Response equipment Inspections (Fire Extinguishers, Eye wash First Aid/CPR etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Review APP for new site personnel.</li> <li>• Certified forklift operator</li> <li>• 1<sup>st</sup> Aid/CPR 1<sup>st</sup> Aid/CPR (2 per site when medical attention a medical facility or physician is more than 5 minutes away to two or more employees.</li> <li>• Training and medical surveillance per 29CFR1910.120.</li> <li>• Supervisors - BBLPS, SC-HW 10 hour OSHA Construction Safety Training or equivalent</li> </ul>	

NOTES (Field Notes, Review Comments, etc.):

Overall Risk Assessment Code (RAC) (Use highest code)					
Risk Assessment Code (RAC) Matrix					
Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				E = Extremely High Risk	
				H = High Risk	
				M = Moderate Risk	
				L = Low Risk	

**Probability:** Likelihood of the hazard to cause a incident, near miss, or accident.

- Frequent - Occurs very often, known to happen regularly
- Likely - Occurs several times, a common occurrence
- Occasional - Occurs sporadically, but is not uncommon
- Seldom - Remotely possible, could occur at some time
- Unlikely - Can assume will not occur, but not impossible

**Severity:** Outcome/degree of the incident, near miss, or accident.

- Catastrophic - Death or permanent total disability; Major property damage
- Critical - Permanent partial disability or temporary total disability; Extensive damage to equipment or systems
- Marginal - Lost workdays due to injury or illness; Minor damage to equipment or systems, property, or the environment
- Negligible - First aid or minor medical treatment; Slight equipment or system damage, but fully functional or serviceable; Little or no property or environmental damage



### ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL</b> (Small Business Remedial Action Contract)	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Site Cleanup and Restoration</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 3/5/14</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	

**15. Personal Protective Clothing and Equipment: Level D PPE**  
 D<sub>1</sub>: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection (inner and outer chemical resistant gloves) when chemical hazards are **Limited to Hands Only** OR  
 D<sub>2</sub>: D<sub>1</sub>+ chemical resistant suits and boot covers when chemical hazards **Not Limited to the Hands Only**.

**12. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.**  
**13. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.**

**Overall RAC: L**

Job Steps	Hazards	Controls	RAC
Site Cleanup and Restoration	Preparedness	<ul style="list-style-type: none"> <li>Verify that EMS services are available and can respond in a prompt manner prior to the start of work.</li> <li>Base or Local Emergency medical Service and Fire Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Buddy System maintained for all phases of work.</li> </ul>	L
	Adverse Weather	<ul style="list-style-type: none"> <li>Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>Frequently observe the skyline for developing rain squalls and thunder storms systems that may developing.</li> <li>Bring clothing suitable for anticipated daily weather conditions.</li> <li>Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 - 30 rule.</li> <li>Do not use telephones during electrical storms, except in the case of emergency.</li> <li>Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained and enrolled in a medical surveillance program in accordance with 29CFR1910.120.</li> <li>Do not allow dermal contact or incidental ingestion of impacted soil/sediment or water.</li> <li>Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or water) without first donning proper PPE.</li> <li>Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Shower as soon as possible after leaving the site.</li> <li>Only eat, drink, smoke or chew tobacco in designated areas.</li> <li>Adhere to PPE and action monitoring requirements identified in Tables 1-1 and 1-2 respectively of <b>Attachment 1 of the APP, Site Safety and Health Plan</b> of the APP.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges of loads or rigging.</li> <li>Keep fingers/hands/arms out of potential pinch points of rigging and loads.</li> <li>Avoid use of razor knives.</li> <li>When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L

### ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)</b>		<b>2. Contract Number: N62470-08-D-1006</b>	
		<b>3. Contract Task Order Number: JM19</b>	
<b>4. Project Location: Whiting Field Site 4</b>		<b>5. Job/Task: Site Cleanup and Restoration</b>	
<b>6. Prepared By: Josh Painter</b>	<b>8. Reviewed By:</b>	<b>10. Modified By:</b>	
<b>7. Date Prepared: 3/5/14</b>	<b>9. Date Reviewed:</b>	<b>11. Date Modified:</b>	
<b>15. Personal Protective Clothing and Equipment: Level D PPE</b>			
D <sub>1</sub> : Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection (inner and outer chemical resistant gloves) when chemical hazards are <b>Limited to Hands Only</b> OR			
D <sub>2</sub> : D <sub>1</sub> + chemical resistant suits and boot covers when chemical hazards <b>Not Limited to the Hands Only</b> .			
<b>12. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>			<b>Overall RAC: L</b>
<b>13. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			
Job Steps	Hazards	Controls	RAC
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:               <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.               <ul style="list-style-type: none"> <li>➢ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➢ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non- caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast– be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L

**ACTIVITY HAZARD ANALYSIS**

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
4. Project Location: Whiting Field Site 4		5. Job/Task: Site Cleanup and Restoration	
6. Prepared By: Josh Painter	8. Reviewed By:	10. Modified By:	
7. Date Prepared: 3/5/14	9. Date Reviewed:	11. Date Modified:	
15. Personal Protective Clothing and Equipment: Level D PPE D1: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection (inner and outer chemical resistant gloves) when chemical hazards are <b>Limited to Hands Only</b> OR D2: D1+ chemical resistant suits and boot covers when chemical hazards <b>Not Limited to the Hands Only</b> .			
12. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
13. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			
Job Steps	Hazards	Controls	RAC
	Housekeeping	<ul style="list-style-type: none"> <li>During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L
	Manual Lifting	<ul style="list-style-type: none"> <li>AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift— especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Overhead Utilities	<ul style="list-style-type: none"> <li>Maintain proper separation between Power Transmission Lines and over overhead utilities during the operation of heavy equipment or haul truck deliveries.</li> <li>Be cognizant of utility pole guy wire positions during haul truck deliveries.</li> </ul>	L
	Pinched/Struck -by/ Caught-in-between	<ul style="list-style-type: none"> <li>Sufficient separation between ground support personnel and any operating heavy equipment must be maintained.</li> <li>Wear reflective vests or high visibility clothing to promote visibility of ground personnel for equipment operators.</li> <li>Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>Ground personnel shall avoid positioning themselves between fixed objects, operating equipment.</li> <li>Make/maintain eye contact with operators before approaching equipment.</li> <li>Do not approach equipment from rear or from blind spot of operator.</li> <li>Stay out of the swing radius of operating heavy equipment.</li> <li>Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>Ensure equipment has operable back-up alarms.</li> <li>Step away from heavy equipment when adjustments (positioning) are made.</li> <li>Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>Ensure that all ground personnel have sufficient separation from tub grinding operations.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L

**ACTIVITY HAZARD ANALYSIS**

1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)		2. Contract Number: N62470-08-D-1006 3. Contract Task Order Number: JM19	
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12. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 13. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L
<b>EQUIPMENT REQUIRED</b>		<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	
<ul style="list-style-type: none"> <li>Fire extinguisher (with fuel and electrical sources)</li> <li>Eye wash (small portable type)</li> <li>Miscellaneous power and manual hand tools.</li> <li>First Aid/BbPK/CPR shield</li> <li>Spill Kit</li> <li>Communication devices</li> </ul>	<ul style="list-style-type: none"> <li>Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>Emergency Response equipment Inspections (Fire Extinguishers, Eye wash First Aid/CPR etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Review APP for new site personnel.</li> <li>1st Aid/CPR 1st Aid/CPR (2 per site when medical attention a medical facility or physician is more than 5 minutes away to two or more employees.</li> <li>Training and medical surveillance per 29CFR1910.120.</li> <li>Supervisors - BBLPS, SC-HW 10 hour OSHA Construction Safety Training or equivalent</li> </ul>	

L

NOTES (Field Notes, Review Comments, etc.):

Overall Risk Assessment Code (RAC) (Use highest code)					
Risk Assessment Code (RAC) Matrix					
Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
<b>Step 1:</b> Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
<b>"Probability"</b> is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.					<b>RAC Chart</b> <b>E = Extremely High Risk</b> <b>H = High Risk</b> <b>M = Moderate Risk</b> <b>L = Low Risk</b>
<b>"Severity"</b> is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					
<b>Step 2:</b> Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.					

**Probability:** Likelihood of the hazard to cause an incident, near miss, or accident.

- Frequent - Occurs very often, known to happen regularly
- Likely - Occurs several times, a common occurrence
- Occasional - Occurs sporadically, but is not uncommon
- Seldom - Remotely possible, could occur at some time
- Unlikely - Can assume will not occur, but not impossible

**Severity:** Outcome/degree of the incident, near miss, or accident.

- Catastrophic - Death or permanent total disability; Major property damage
- Critical - Permanent partial disability or temporary total disability; Extensive damage to equipment or systems
- Marginal - Lost workdays due to injury or illness; Minor damage to equipment or systems, property, or the environment
- Negligible - First aid or minor medical treatment; Slight equipment or system damage, but fully functional or serviceable; Little or no property or environmental damage

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**SITE PERSONNEL**

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## ACTIVITY HAZARD ANALYSIS

<b>1. Contractor: AGVIQ-CH2M HILL (Small Business Remedial Action Contract)</b>	<b>2. Contract Number: N62470-08-D-1006</b> <b>3. Contract Task Order Number: JM19</b>
<b>4. Project Location: Whiting Field Site 4</b>	<b>5. Job/Task: Decontamination and Demobilization</b>
<b>6. Prepared By: Josh Painter</b> <b>7. Date Prepared: 12/23/11</b>	<b>8. Reviewed By:</b> <b>9. Date Reviewed:</b>
<b>10. Modified By:</b> <b>11. Date Modified:</b>	

**12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE**  
 Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR  
 Modified D<sub>1</sub>: Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are **Limited to Hands Only** OR  
 Modified D<sub>2</sub>: D<sub>1</sub>+ chemical resistant suits and boot covers when chemical hazards **Not Limited to the Hands Only**.

**13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.**  
**14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.**

**Overall  
RAC: L**

Job Steps	Hazards	Controls	RAC
Decontamination and Demobilization	Preparedness	<ul style="list-style-type: none"> <li>Verify that EMS services are available and can respond in a prompt manner prior to the start of work.</li> <li>Base or Local Emergency medical Service and Fire Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Buddy System maintained for all phases of work.</li> </ul>	L
	Adverse Weather	<ul style="list-style-type: none"> <li>Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available onsite to monitoring local weather or marine forecasts. If onsite internet or radio monitoring are not available, check with home office support personnel who may be able to verify pending regional severe weather conditions.</li> <li>Frequently observe the skyline for developing rain squalls and thunder storms systems that may developing.</li> <li>Bring clothing suitable for anticipated daily weather conditions.</li> <li>Shut down operations during heavy rain/lightning events or high wind conditions. Seek refuge in the properly grounded construction trailer or rubber tire vehicle for storms producing lightning. Implement 30 - 30 rule.</li> <li>Do not use telephones during electrical storms, except in the case of emergency.</li> <li>Do not execute boating operations when adverse weather is pending or occurring.</li> </ul>	L
	Biological	<ul style="list-style-type: none"> <li>Prior to starting field activities, notify supervisors of known allergies to stinging insects and location of antidotes.</li> <li>Use insect repellent with DEET or other insect repellent to deter being bit by mosquitoes or other stinging/biting insects.</li> <li>Avoid exposure to blood borne pathogens if the administration of First Aid is required. Use universal precautions against exposure if administering first aid is required.</li> </ul>	L
	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained and enrolled in a medical surveillance program in accordance with 29CFR1910.120.</li> <li>Do not allow dermal contact or incidental ingestion of impacted soil/sediment or water.</li> <li>Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or water) without first donning proper PPE.</li> <li>Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Shower as soon as possible after leaving the site.</li> <li>Only eat, drink, smoke or chew tobacco in designated areas.</li> <li>Adhere to PPE and action monitoring requirements identified in Tables 1-1 and 1-2 respectively of <b>Attachment 1 of the APP, Site Safety and Health Plan</b> of the APP.</li> </ul>	L
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges of loads or rigging.</li> <li>Keep fingers/hands/arms out of potential pinch points of rigging and loads.</li> <li>Avoid use of razor knives.</li> <li>When cutting with knives, cut away from the body and never towards another worker.</li> </ul>	L

### ACTIVITY HAZARD ANALYSIS

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12. Personal Protective Clothing and Equipment: Level D and Modified Level D PPE Level D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and leather work gloves OR Modified D <sub>1</sub> : Level D + hand protection (inner and outer chemical resistant gloves) when chemical hazards are <b>Limited to Hands Only</b> OR Modified D <sub>2</sub> : D <sub>1</sub> + chemical resistant suits and boot covers when chemical hazards <b>Not Limited to the Hands Only</b> .			
13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task. 14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.			Overall RAC: L
Job Steps	Hazards	Controls	RAC
	Electric Safety	<ul style="list-style-type: none"> <li>• Ensure that electric connections from generator set to temporary construction facilities are performed by qualified electricians.</li> <li>• Inspect all electrical power circuits are sufficient prior to connection.</li> <li>• If/when electrical extension cords are required to complete work, extension cords must be:                             <ul style="list-style-type: none"> <li>✓ Equipped with third-wire grounding.</li> <li>✓ Covered, elevated, or protected from damage when passing through work areas.</li> <li>✓ Protected from pinching if routed through doorways.</li> <li>✓ Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>✓ Rated to handle the voltage/amperage of equipment.</li> </ul> </li> </ul>	M
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Fire extinguishers must be inspected monthly (inspection tag) and have an annual maintenance/inspection certification (tag) attached to the extinguisher.</li> <li>• Only smoke in designated areas. Designated area must be free of combustible/flammable materials.</li> <li>• ASTs for heavy equipment fuel storage should have secondary containment capabilities.</li> </ul>	L
	Hand Tools	<ul style="list-style-type: none"> <li>• Select and use the proper tool for the task.</li> <li>• Do not use tools that have been damaged or repaired in a manner which is not consistent with manufacturer's requirements.</li> </ul>	L
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.</li> <li>• <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ul>	L

## ACTIVITY HAZARD ANALYSIS

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<b>13. Competent Person Requirement: Not Applicable. There is no Competent Person requirement for this task.</b>			<div style="background-color: #90EE90; padding: 5px; border: 1px solid black;"> <b>Overall RAC: L</b> </div>
<b>14. Competent Person Name: Not Applicable. There is no Competent Person requirement for this task.</b>			
Job Steps	Hazards	Controls	RAC
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate waterproof gear is a must in where wet weather occurs during cool low ambient temperatures.                             <ul style="list-style-type: none"> <li>➤ Frostbite: Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.</li> <li>➤ Hypothermia: Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.</li> </ul> </li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non-caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>• Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance.</li> <li>• Wear layered clothing, moisture wicking clothes next to body, weather resistant exterior.</li> </ul>	L
	Housekeeping	<ul style="list-style-type: none"> <li>• During the course of executed project operations all debris, shall be kept cleared from work areas and passageways. Establish common paths of travel and keep them free from the accumulation of materials. Store tools, equipment, materials, and supplies in an orderly manner.</li> </ul>	L
	Manual Lifting	<ul style="list-style-type: none"> <li>• AGVIQ-CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, especially lifting operation involving repetitive motions.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. Use heavy equipment to transfer heavy or awkward loads wherever possible. Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads. Do not attempt to manually lift objects that should otherwise be lifted with heavy equipment.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. Avoid carrying heavy objects above shoulder level.</li> </ul>	L
	Overhead Utilities	<ul style="list-style-type: none"> <li>• Maintain proper separation between Power Transmission Lines and over overhead utilities during the operation of heavy equipment or haul truck deliveries.</li> <li>• Be cognizant of utility pole guy wire positions during haul truck deliveries.</li> </ul>	L

	Pinched/Struck-by/ Caught-in-between	<ul style="list-style-type: none"> <li>• Sufficient separation between ground support personnel and any operating heavy equipment must be maintained.</li> <li>• Wear reflective vests or high visibility clothing to promote visibility of ground personnel for equipment operators.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>• Ground personnel shall avoid positioning themselves between fixed objects, operating equipment.</li> <li>• Make/maintain eye contact with operators before approaching equipment.</li> <li>• Do not approach equipment from rear or from blind spot of operator.</li> <li>• Stay out of the swing radius of operating heavy equipment.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>• Ensure equipment has operable back-up alarms.</li> <li>• Step away from heavy equipment when adjustments (positioning) are made.</li> <li>• Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>• Ensure that all ground personnel have sufficient separation from tub grinding operations.</li> </ul>	L
	Pressure Washing	<ul style="list-style-type: none"> <li>• Inspect pressure washer before use and confirm dead man switch fully operational.</li> <li>• The wand must always be pointed at the work area.</li> <li>• The Wand trigger should never be tied down in the open position.</li> <li>• Never point the wand at yourself or another worker.</li> <li>• The wand must be at least 42 inches from the trigger to the tip.</li> <li>• The operator must maintain good footing.</li> <li>• Non-operators must remain a safe distance from the operator.</li> <li>• No unauthorized attachment may be made to the unit.</li> <li>• Do not modify the wand.</li> <li>• All leaks or malfunctioning equipment must be repaired immediately or the unit taken out-of-service.</li> <li>• Rain gear (disposal coated chemical suits for Hazwoper operations), 16-inch-high steel-toed rubber boots, safety glasses, hard hat with face shield, and inner and outer nitrile gloves should be worn, at a minimum during pressure washing operations.</li> </ul>	L
	Slips, Trips, Falls/ housekeeping	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet surfaces on piers/ramps, unprotected holes, drainage areas, rip rap, utilities, ground protrusions. Observe, mark and avoid any of these identified conditions. Use sturdy hard-toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible.</li> <li>• Three points of contact when enter/exiting equipment or when using stairways/ladders.</li> </ul>	L
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	L

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> <li>• Fire extinguisher (with fuel and electrical sources)</li> <li>• Eye wash (small portable type)</li> <li>• Miscellaneous power and manual hand tools.</li> <li>• First Aid/BbPK/CPR shield</li> <li>• Communication devices</li> </ul>	<ul style="list-style-type: none"> <li>• Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>• Equipment inspections and maintenance.</li> <li>• Emergency Response equipment Inspections</li> <li>• (Fire Extinguishers, Eye wash First Aid/CPR etc.)</li> <li>• Inspections of hand tools (power) and extension cords if used.</li> </ul>	<ul style="list-style-type: none"> <li>• Review AHA with all task personnel</li> <li>• Review Site Safety and Health Plan for new site personnel.</li> <li>• 1st Aid/CPR (2 per site when medical attention a medical facility or physician is more than 5 minutes away to two or more employees.</li> <li>• Training and medical surveillance per 29CFF1910.120.</li> <li>• Supervisors - BBLPS, 10 hour OSHA Construction Safety Training or equivalent</li> </ul>

NOTES (Field Notes, Review Comments, etc.):

Overall Risk Assessment Code (RAC) (Use highest code)					
Risk Assessment Code (RAC) Matrix					
Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
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**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above)

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RAC Chart	
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**SITE PERSONNEL**

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**Attachment 1**  
**Site Safety and Health Plan**

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# Site Safety and Health Plan

Enhanced In Situ Biofilter Pilot Study  
Site 4 - North AVGAS Tank Sludge Disposal Area  
Naval Air Station Whiting Field  
Milton, Florida

Contract No. N624670-08-D-1006

Task Order No. JM19

Submitted to:



Prepared by:



July 2015  
Revision No. 00

# Contents

<b>Acronyms and Abbreviations .....</b>	<b>v</b>
<b>1.0 Site Safety and Health Plan of HRTW Work (28.B) .....</b>	<b>1</b>
1.1 Occupational Safety and Health Hazards with Site Cleanup 28.B.01.a.....	1
1.2 Site Description and Contamination Characterization 28.B.02.a.....	1
1.2.1 Potential Routes of COC Exposure .....	3
1.3 Hazard/Risk Analysis 28.B.02.b .....	3
1.4 Staff Organization, Qualifications, and Responsibilities 28.B.02.c .....	3
1.4.1 Training, General and Project-Specific 28.B.02.d .....	3
1.5 Medical Surveillance 28.B.02.f .....	3
1.6 Personal Protective Equipment and Exposure Monitoring/ Air Sampling 28.B.02.e&g.....	3
1.6.1 Air Monitoring Equipment Calibration Requirements.....	6
1.7 Heat and Cold Stress 28.B.02.h.....	6
1.8 Standard Operating Safety Procedures, Engineering Controls, and Work Practices 28.B.02.i.....	6
1.8.1 Site Rules and Prohibitions 28.B.02.i(1).....	6
1.9 Work Permit Requirements 28.B.02.i(2) .....	6
1.10 Material Handling Procedures 28.B.02.i(3).....	7
1.10.1 Drum, Container, Tank Handling 28.B.02.i(4).....	7
1.11 Comprehensive AHA of Treatment Technologies 28.B.02.i(5) .....	7
1.12 Site Control Measures – General 28.B.02.j.....	7
1.12.1 Site Control Measures – Hazwoper .....	8
1.12.2 Exclusion Zone.....	9
1.12.3 Contamination Reduction Zone .....	9
1.12.4 Support Zone .....	9
1.12.5 HAZWOPER Compliance Plan.....	10
1.13 Personal Hygiene and Decontamination 28.B.02.k.....	10
1.13.1 Decontamination Specifications .....	11
1.13.2 Equipment Decontamination.....	13
1.14 Emergency Equipment and First Aid 28.B.02.m .....	13
1.14.1 Emergency Response and Contingency Procedures 28.B.02.n .....	13
1.14.2 Route Map to Emergency Medical Facilities 28.B.02.n(5).....	14
1.14.3 Criteria for Alerting Medical Facilities 28.B.02.n(6) .....	14
1.14.4 Responsibilities 28.C .....	14
1.14.5 Training 28.D.....	15
1.14.6 Medical Surveillance 28.E .....	15
1.14.7 RCRA TSD Facilities 28.F .....	15
1.14.8 Facility/Construction Project Emergency Response 28.G.....	15

**Tables**

- 1-1 Personal Protection Equipment Requirements
- 1-2 Air Monitoring Requirements
- 1-3 Air Monitoring Equipment Calibration Requirements

# Acronyms and Abbreviations

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APP	Accident Prevention Plan
AGVIQ-CH2M HILL	AGVIQ-CH2M HILL Joint Venture III (Small Business Remedial Action Contract)
APP	Accident Prevention Plan
BBLPS	Behavior Based Loss Prevention System
CBRNE	Chemical, Biological, Nuclear, Radiological, Explosive
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COC	chemical of concern
CRZ	Contamination Reduction Zone
DFOW	Definable Feature of Work
DFWP	Drug Free Workplace Program
EMS	Emergency Medical Services
EZ	Exclusion Zone
GDA	Government Designated Authority
HSPA	Health and Safety Program Administrator
LLC	Limited Liability Company
mg/m <sup>3</sup>	milligrams per cubic meter
NAS	Naval Air Station
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Limit (OSHA)
PPE	Personal Protective Equipment
ppm	Parts per million
PTSP	Pre-Task Safety Plan
SBRAC	Small Business Remedial Action Contract

SOH	Safety and Occupational Health
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SZ	Support Zone
TO	Task Order

# 1.0 Site Safety and Health Plan of HRTW Work (28.B)

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## 1.1 Occupational Safety and Health Hazards with Site Cleanup 28.B.01.a

All site work shall be performed in accordance with the project Accident Prevention Plan (APP) and this Site Safety and Health Plan (SSHP). In accordance with the allowance of EM 385 1-1, section 28.B.02 *“general information adequately covered in the APP (introduction, site background, SOH organization and lines of authority, general site control and layout and general site safety procedures, logs, reports and inspections) need not be duplicated.”* Health and safety hazard control measures policies and procedures, and means and methods or other information presented throughout this APP that sufficiently addresses the requirements of EM 385 1-1, section 28.B.02 will not be further elaborated upon in this SSHP.

## 1.2 Site Description and Contamination Characterization 28.B.02.a

A site description for the project site is provided in Section 2.0 “Background Information” of the APP and will not be further elaborated upon in this section of the SSHP.

Summarized site contamination characterization data is provided by the list of maximum site COC concentrations identified below.

Constituents	Maximum Concentration	Exposure (PEL)	IDLH ppm	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)
Arsenic	SB: 6.4 mg/kg SS: 5.5 mg/kg	0.01 mg/m <sup>3</sup>	5 mg/m <sup>3</sup> as As Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
AVGAS / Gasoline Range Organics (TPH)	SB: 57480 ppm	100 mg/m <sup>3</sup> (REL)	NL	Eye, skin and mucous membrane irritation; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, chemical pneumonia on aspiration, possible liver and kidney damage	UK
Benzene	SB: 24.6 ppm	0.5 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
Ethyl Benzene	SB: 935 ppm	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Lead	SB: 27 mg/kg	0.05 mg/m <sup>3</sup>	100 mg/m <sup>3</sup> as Pb	Weakness lassitude, facial pallor, pal eye, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	NA
PNAs (Limits as Coal Tar Pitch)	SB: 8.7 mg/kg	0.2 mg/m <sup>3</sup>	80 Ca	Dermatitis and bronchitis	UK
Toluene	SB: 2000 ppm	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Xylenes (total) (as O, M, or P Xylene)	SB: 1540 ppm	100 ppm (PEL)	900 ppm	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, uncoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	8.56

**Footnotes:**

<sup>a</sup> Specify sample-designation and media: SB (Soil Boring/Subsurface Soil), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil/Sediment), SL (Sludge), SW (Surface Water), SD (Sediment), SG (Soil Gas)

<sup>b</sup> Appropriate value of PEL, REL, or TLV listed.

<sup>c</sup> IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

<sup>d</sup> PIP = photoionization potential; NA = Not applicable; UK = Unknown.

<sup>e</sup> Denotes a ceiling value ( C ) (15 minutes) unless otherwise identified.

<sup>f</sup> Denotes a value established by the ACGIH.

<sup>g</sup> Denotes a value established by the ACGIH and a ceiling value (15 minutes).

ppb Denotes sample concentration is in Parts per Billion unless otherwise noted.

PEL = Denotes OSHA Permissible Exposure Limit unless otherwise identified.

Ca = Potential Occupational Carcinogen

ST = Short Term Exposure Limit or "excursion limit usually a 15 minute duration unless otherwise noted.

SKIN = Indicates the potential for dermal absorption; skin exposure should be prevented as necessary through the use of good work practices, gloves, coveralls, goggles, and other appropriate equipment.

### 1.2.1 Potential Routes of COC Exposure

**Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of personal protective equipment (PPE), as specified in Table 1-1 of this Site Specific Health and Safety Plan (SSHSP).

**Inhalation:** Air Bourne particulates impacted by PCB or other particulates. This route of exposure is minimized through proper use of dust control during executed site operations and by monitoring particulate (dust) concentrations in the worker breathing zone in accordance with the requirements of Table 1-2 of this SSHSP.

**Other: *Inadvertent ingestion of contaminated media:*** This route should not present a concern if good hygiene practices are followed (e.g., wash hands/face before eating, drinking, or smoking).

## 1.3 Hazard/Risk Analysis 28.B.02.b

Hazard/Risk Analysis for this project is provided in section 10.6 "Project Specific Activity Hazard Analyses" of the APP and will not be elaborated upon further in this section.

## 1.4 Staff Organization, Qualifications, and Responsibilities 28.B.02.c

Staff organization, qualifications and responsibilities is identified in section 4.0 "Responsibilities and Lines of Authority" and section 6.0 "Training" of the APP and will not be elaborated upon further in this section.

Qualifications of key site personnel must be provided to the government designated authority (GDA), under separate cover for review well in advance

### 1.4.1 Training, General and Project-Specific 28.B.02.d

General and project specific training is identified in section 6.0 "Training" of the APP and will not be elaborated upon further in this section.

## 1.5 Medical Surveillance 28.B.02.f

Site worker medical surveillance requirements is identified in section 6.0 "Training" of the APP and will not be further elaborated upon in this section of the SSHP.

## 1.6 Personal Protective Equipment and Exposure Monitoring/Air Sampling 28.B.02.e&g

The requirements for the use of PPE and worker exposure monitoring and air sampling in connection with the execution of identified project definable features of work (DFOWs) are provided in Tables 1-1 and Table 1-2, respectively, below.

TABLE 1-1 Personal Protective Equipment Requirements<sup>a</sup>

Task	Level	Body	Head	Respirator <sup>b</sup>
1. Mobilization <ul style="list-style-type: none"> <li>Mobilizing personnel and equipment</li> <li>Establishing a decontamination area</li> <li>Utility survey of excavation sites</li> </ul>		<ul style="list-style-type: none"> <li>Designated and appropriate work clothes</li> <li>Hard-toe work boots that provide sufficient ankle support (preferable leather)</li> <li>Work gloves (cut resistant) or liquid resistant for wet work environments</li> <li>Reflective traffic vest</li> </ul>	<ul style="list-style-type: none"> <li>Hardhat<sup>c</sup></li> <li>Safety glasses</li> <li>Hearing protection (as applicable)<sup>d</sup></li> </ul>	
2. Enhanced In Situ Biofilter Pilot Study <ul style="list-style-type: none"> <li>In Situ Biofilter Materials and Construction                             <ul style="list-style-type: none"> <li>Biofilter Materials Preparation</li> <li>Excavation and Backfill</li> <li>Biofilter Piping/Materials Installation</li> <li>Final Piping Connections (clean materials)</li> <li>Blower Connections (clean materials)</li> </ul> </li> <li>In Situ Biofilter Test Procedures                             <ul style="list-style-type: none"> <li>Background Flux Sampling</li> <li>System Startup</li> </ul> </li> </ul>	D			None required
3. Site Cleanup and Restoration (clean areas)				
4. Decontamination/Demobilization				
Any function identified in this APP where potential dermal contact with site chemicals used on-site <b>IS limited to the hands only.</b>				
1. Enhanced In Situ Biofilter Pilot Study <ul style="list-style-type: none"> <li>In Situ Biofilter Materials and Construction                             <ul style="list-style-type: none"> <li>Final Piping Connections</li> <li>Blower Connections</li> </ul> </li> <li>In Situ Biofilter Test Procedures                             <ul style="list-style-type: none"> <li>Background Flux Sampling</li> <li>System Startup</li> <li>First Month Monitoring and Maintenance</li> <li>90-Day Biofilter Assessment</li> <li>Long-Term Biofilter Assessment</li> </ul> </li> </ul>	Modified D1	<ul style="list-style-type: none"> <li>Designated and appropriate work clothes;</li> <li>Boots: Hard-toe work boots that provide sufficient ankle support (preferable leather); with outer rubber boot covers or hard-toe chemically resistant rubber boots with steel shank</li> <li>Work gloves (cut resistant) when handling items that pose a cut hazard</li> <li>Gloves: Inner surgical-style nitrile chemical resistant Nitrile gloves and leather work gloves</li> </ul>	<ul style="list-style-type: none"> <li>Hardhat<sup>c</sup></li> <li>Safety glasses</li> <li>Ear protection (as applicable)<sup>d</sup></li> <li>Face shields and goggles (required when pressure washing)</li> <li>Reflective safety vest</li> </ul>	None required.
2. Decontamination/Demobilization				
Any function identified in this APP where potential dermal contact with site COCs is <b>NOT limited to the hands only.</b>				
1. Decontamination/Demobilization	Modified D2	<ul style="list-style-type: none"> <li>Coveralls: Poly coated (or equivalent) chemical resistant disposable coveralls.</li> <li>Boots: Hard-toe work boots that provide sufficient ankle support (preferable leather); with outer rubber boot covers or hard-toe chemically resistant rubber boots with steel shank</li> <li>Gloves: Inner surgical-style nitrile and outer chemical resistant Nitrile gloves.</li> </ul>	<ul style="list-style-type: none"> <li>Hardhat<sup>c</sup></li> <li>Ear protection (as applicable)<sup>d</sup></li> <li>Face shields and goggles (required when pressure washing)</li> </ul>	None required.

**Reasons for Upgrading or Downgrading Level of Protection**

Upgrade <sup>f</sup>	Downgrade
<ul style="list-style-type: none"> <li>Request from individual performing tasks.</li> <li>Change in work tasks that will increase contact or potential contact with hazardous materials.</li> <li>Known or suspected presence of dermal hazards.</li> <li>Instrument action levels exceeded (when implemented).</li> </ul>	<ul style="list-style-type: none"> <li>New information indicating that situation is less hazardous than originally thought.</li> <li>Change in site conditions that decrease the hazard.</li> <li>Change in work task that will reduce contact with hazardous materials.</li> </ul>

<sup>a</sup> Modifications are as indicated. AGVIQ-CH2M HILL will provide PPE only to AGVIQ-CH2M HILL employees.

<sup>b</sup> No facial hair that would interfere with respirator fit is permitted.

<sup>c</sup> Hardhat and splash-shield areas are to be determined by the SSSHO.

<sup>d</sup> Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

<sup>e</sup> Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range --then at least every 4 hours.

If encountered conditions are different than those anticipated in this APP, contact the HSPA/CIH. **Where AGVIQ-CH2M HILL personnel are required to use a respirator to provide respiratory protection, AGVIQ-CH2M HILL personnel shall receive respiratory protection awareness training. Contact the HSPA/CIH to receive this training, prior to using any respiratory protective device.**

<sup>f</sup> Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level D modified/Level C) is permitted only when the PPE requirements have been approved by the HSPA/CIH, and an SSSHO qualified at that level is present.

TABLE 1-2  
AIR MONITORING EQUIPMENT REQUIREMENTS

Instrument	Tasks	Action Levels <sup>a</sup>	Level of Protection/ Response Action	Frequency <sup>b</sup>	Calibration
<b>PID: MultiRAE or equivalent (10.6 eV lamp) Or FID</b>	1. Enhanced In Situ Biofilter Pilot Study	< 0.5 ppm (above background) (in worker BZ)	Level D, Modified D and continue work.	<ul style="list-style-type: none"> <li>Initially and periodically during the execution of activities where PID/FID monitoring is required.</li> <li>Any activity where free phase product is observed/encountered during the execution of listed Tasks.</li> <li>Continuously upon re-start of any ceased work to verify PID/FID readings are below Action Levels in worker BZ.</li> </ul>	Daily
	<ul style="list-style-type: none"> <li>In Situ Biofilter Materials and Construction                             <ul style="list-style-type: none"> <li>Final Piping Connections</li> <li>Blower Connections</li> </ul> </li> <li>In Situ Biofilter Test Procedures                             <ul style="list-style-type: none"> <li>Background Flux Sampling</li> <li>System Startup</li> <li>First Month Monitoring and Maintenance</li> <li>90-Day Biofilter Assessment</li> <li>Long-Term Biofilter Assessment</li> </ul> </li> </ul>	0.5 - 1 ppm (above background) (sustained 5 mins. in worker BZ)	Begin compound specific air monitoring for Benzene (as described below). If Benzene is not present continue in appropriate PPE and continue work up to 5 ppm.		
		> 0.5 ppm with Benzene present (above background, sustained 5 minutes in worker BZ)	Stop work. Evacuate area for 10 minutes and recheck BZ and work area. If levels persist, consult Program RHSM for additional engineering and/or administrative controls and PPE upgrade requirements.		
	2. Decontamination/Demobilization	5-10 ppm with no Benzene Present (above background, sustained 5 minutes in worker BZ)	Begin compound specific air monitoring for Toluene (as described below). If Toluene is not present continue in appropriate PPE and continue work up to 20 ppm.		
		>10 ppm with Toluene Present (above background, sustained 5 minutes in worker BZ)	Stop work. Evacuate area for 10 minutes and recheck BZ and work area. If levels persist, consult Program RHSM for additional engineering and/or administrative controls and PPE upgrade requirements.		
		< 25 ppm with no Benzene or Toluene present	Continue in appropriate PPE and continue work, increase monitoring frequency.		
		> 25 ppm	Stop work. Evacuate area for 10 minutes and recheck BZ and work area. If levels persist, consult Program RHSM for additional engineering and/or administrative controls and PPE upgrade requirements.		
<b>Dräger Chip Measurement System (CMS)</b> Benzene = Chip # 64 06030 Toluene = Chip # 64 06250	Any task where the above PID action levels are exceeded	See action levels above if Benzene or Toluene are indicated	Follow actions above for PID/FID monitoring	Where the PID/FID action level is exceeded.	Not applicable

<sup>a</sup> Action levels apply to sustained breathing-zone measurements, above background.

<sup>b</sup> The exact frequency of monitoring depends on field conditions and is to be determined by the SSHO; generally, every 5 to 15 minutes is acceptable; more frequently may be appropriate. Monitoring results shall be recorded in the Air Monitoring Log contained in **Attachment 3 of APP** and included in the final project record. Documentation shall include instrument and calibration information, time, measurement results, personnel/area monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).

<sup>c</sup> **Note: Worker breathing zone ambient air monitoring results must be logged on an Air Monitoring Log (See Attachment 3 of APP).**

## 1.6.1 Air Monitoring Equipment Calibration Requirements

Air Monitoring equipment calibration specifications for air monitoring equipment identified in Table 1-2 are listed in Table 1-3, below.

TABLE 1-3

Air Monitoring Equipment Calibration Requirements

Instrument	Gas	Span	Reading	Method
<b>PID: 10.6 eV Lamp</b>	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing/ tedlar bag
<b>FID</b>	“zero air” gas followed by 100 ppm methane	RF = 1.0	100 ppm	1.5 lpm reg T-tubing/ tedlar bag “zero air” gas followed by methane

Note: Air monitoring equipment calibration measures must be logged on the Project Air Monitoring Logs (**See Attachment 3 of APP**) and included in the final project record.

## 1.7 Heat and Cold Stress 28.B.02.h

The procedures for heat and cold stress monitoring are presented in section 9.14 “Heat and Cold Stress Monitoring Program” of the APP and will not be further elaborated upon in this section of the SSHP.

## 1.8 Standard Operating Safety Procedures, Engineering Controls, and Work Practices 28.B.02.i

### 1.8.1 Site Rules and Prohibitions 28.B.02.i(1)

Site rules and prohibitions and requirements are defined by the sections identified below and will not be further elaborated upon in this section of this SSHP.

Section 8.0 of the APP:	Accident Reporting and Investigation
Section 9.2 of the APP:	Emergency Response Plans
Section 9.7 of the APP:	Health Hazard Control Program
Section 1.2.8.7 of the SSHP:	Site Control Measures
Section 10.5 of the APP:	Drug Free Work Place Program

### 1.9 Work Permit Requirements 28.B.02.i(2)

Any work permit requirements necessary to execute the assigned work is identified in section 7.1 “External Inspections/Certifications” of the APP and will not be further elaborated upon in this section of the SSHP.

## 1.10 Material Handling Procedures 28.B.02.i(3)

Hazard Control Measures for haul truck activities, and working around material handling equipment are included in section 9.7 "Health and Safety Hazard Control Program" of the APP and will not be further elaborated upon in this SSHP.

### 1.10.1 Drum, Container, Tank Handling 28.B.02.i(4)

(Reserved)

There will be no significant drum, container or tank handling during the execution of this CTO.

## 1.11 Comprehensive AHA of Treatment Technologies 28.B.02.i(5)

(Reserved)

No treatment technologies will be executed during this CTO.

## 1.12 Site Control Measures – General 28.B.02.j

Access to the site will be limited to only those authorized personnel designated to work at the site. Site workers and visitors shall sign-in and sign-out as they enter and exit the site work boundaries (see **Attachment 3 of APP**). In addition to these procedures, the following measures shall be implemented as general site control processes.

- Project managers and team leaders are to:
  - 1) Evaluate and ensure worker safety in remote/secluded work areas,
  - 2) Confirm if potentially dangerous activities could be occurring in or adjacent to any AGVIQ-CH2M HILL work areas that may jeopardize worker health and safety and
  - 3) Reschedule field activities when potentially dangerous activities are not occurring adjacent to AGVIQ-CH2M HILL work locations. Ensure proper two-way communications with workers in remote work areas. Utilize buddy system.
- Evaluate and ensure worker safety in remote/secluded work areas.
- Confirm if potentially dangerous activities could be occurring in or adjacent to any AGVIQ-CH2M HILL work areas that may jeopardize worker health and safety.
- Reschedule field activities when potentially dangerous activities are occurring adjacent to AGVIQ-CH2M HILL work locations. Ensure proper two-way communications with workers in remote work areas.
- **Establish and maintain the "Buddy System."**
- **Designate an emergency evacuation route (see Figure 9-1 of the APP).**
- **Designate an evacuation assembly area.**
- Topics for briefing on site safety: Review the site Accident Prevention, site-specific hazards, locations of work zones, site contaminants, PPE and air requirements, equipment, special procedures, emergencies.

- The SSHO records safety briefing attendance in a logbook and documents the topics discussed.
- Ensure that applicable AGVIQ-CH2M HILL personnel have received the behavior based loss prevention system (BBLPS) training.
- Be aware of any potential for hazardous chemical exposure and know what precautions/training are required.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Know how an emergency should be reported.
- Identify exact facility location and position (where possible) when contacting Emergency Medical System (EMS)/Fire Dispatch.
- Have readily available copy of the Hospital Route Map.
- Establish onsite communication consisting of the following:
  1. Line-of-sight and hand signals
  2. Air horn
  3. Two-way radio or cellular telephone if available
- Establish offsite communication.
- Know how, what, when injuries/accidents are reported and treated.

The site supervisor, SSHO or other authorized designee is to conduct periodic inspections of work practices and site conditions to determine the effectiveness of this plan. Such inspections should identify site conditions or actions that are not consistent with the policies and procedures of the H&S program, report to the AGVIQ-CH2M HILL Project Manager (overall) and the AGVIQ-CH2M HILL Certified Industrial Hygienist (CIH) or health and safety program administrator (HSPA). The project team shall develop and implement corrective action procedures in a timely manner.

### 1.12.1 Site Control Measures – Hazwoper

For the tasks executed under this CTO that are designated as “Hazwoper Regulated”, only personnel trained in accordance with 29 CFR 1910.120/29 CFR 1926.65, that possess skills, experience and knowledge to execute tasks without risk for exposure to site COCs or create an increased risk of cross contamination of areas of the site not previously impacted by site COCs will be allowed in active site work. As such, the implementation of a three-zone site control and decontamination process for site personnel and equipment must be established for the execution of designated Hazwoper regulated activities. Establishment of this three zone site control and decontamination process shall be implemented in accordance with the guidelines set below and utilizing the steps illustrated in Section 1.10 “Personal Hygiene and Decontamination” of this SSHSP.

This APP recommends that the area surrounding each of the work areas be divided into three distinct zones; the exclusion zone (EZ), the contamination reduction zone (CRZ), and the support zone (SZ).

### 1.12.2 Exclusion Zone

Where it is necessary to establish an EZ at the site, will be constructed to surround the area where the greatest potential for worker exposure to identified site COCs may exist.. The EZ may also incorporate any available “permanent” perimeter fencing or other established physical barriers. Other temporary barriers (i.e. caution tape, high visibility construction fencing), maybe used to supplement existing permanent barriers to demarcate the EZ to identify the restricted access. To prevent both exposure of unprotected personnel and migration of contamination, work areas and personal protective equipment requirements should be clearly identified/ delineated. Access to the EZ will be restricted to personnel wearing the prescribed level of protective equipment and meeting the training and medical criteria of this plan

Only individuals who meet the requirements of 29 CFR 1910.120/29CFR1926.65 and who are authorized by the AGVIQ-CH2M HILL site supervisor or SSHO shall be allowed entry into the EZ and CRZ. Suitable means and methods (high visibility fencing, caution tape signage, other physical barriers) shall be employed to demarcate the EZ and CRZ boundaries at this site to prevent unauthorized entry into these controlled work zones. A CRZ for decontamination shall be established adjacent to the EZ. The SZ shall be kept free from contamination.

### 1.12.3 Contamination Reduction Zone

Each CRZ zone should be established as a clearly marked corridor between the EZ and the SZ in which tools and equipment are decontaminated and personnel can don, doff and dispose of and/or decontaminate PPE. The CRZ for each area will be located immediately adjacent to the EZ. This area should also demarcated/identified from support areas with yellow tape, high visibility construction fencing or other suitable barriers.

The CRZ is where personnel will begin the sequential decontamination process when exiting the EZ. To prevent cross contamination and for accountability purposes, all personnel must enter and leave the EZ through the CRZ.

Contaminated personnel tools and equipment will exit the EZ directly to the CRZ. Each CRZ will contain a constructed decontamination stations for personnel and equipment. If possible, the CRZ will be located upwind of each EZ, however due to site constraints this may not be possible. Temporary support zones for each work area will be located adjacent to the CRZs.

### 1.12.4 Support Zone

Temporary support zones and staging areas will be established at the entrance of each control area. Potable water, an eye wash, and first aid supplies will be located at each temporary support zone. No hazardous or potentially hazardous materials will be allowed in the support zone unless it is in a properly labeled container that has no external contamination. Eating, drinking and smoking will only be allowed in this area, at designated locations.

Portable bathroom facilities will be located near the work areas. In addition, potable water and water and soap for hand washing will be available at the support zone, along with containers for solid waste for use by site personnel, in addition to first aid stations and administrative information.

### 1.12.5 HAZWOPER Compliance Plan

Certain parts of the site work are covered by state or federal Hazardous Waste Operations and Emergency Response (HAZWOPER) standards and therefore require training and medical monitoring. Anticipated HAZWOPER tasks (Section 2.4 or otherwise determined) might occur consecutively or concurrently with respect to non-HAZWOPER tasks. This section outlines procedures to be followed when approved activities specified in Section 2.4 of this APP do not require 24- or 40-hour training. Non-HAZWOPER-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to vapors, particulates or mist before non-HAZWOPER-trained personnel are allowed on the site, or while non-HAZWOPER-trained staff are working in proximity to HAZWOPER designated activities. Other data (e.g., soil) also must document that there is no potential for exposure. The Program CIH must approve the interpretation of these data.
- When non-HAZWOPER-trained personnel are at risk of exposure, the site Supervisor or SSHO must post the exclusion zone and inform non-HAZWOPER-trained personnel of the:
  - Nature of the existing contamination and its locations
  - Limitations of their access
  - Emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-HAZWOPER-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminated media.

When exposure is possible, non-HAZWOPER-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.

## 1.13 Personal Hygiene and Decontamination 28.B.02.k

Regardless of whether a CRZ or other decontamination zones must be established to ensure proper decontamination or personnel or equipment, established procedures must be adhered to ensure that direct and indirect worker contact with COCs or hazardous materials does not occur. This is generally achieved by workers adhering to good personal hygiene practices. These practices include but are not limited to the following:

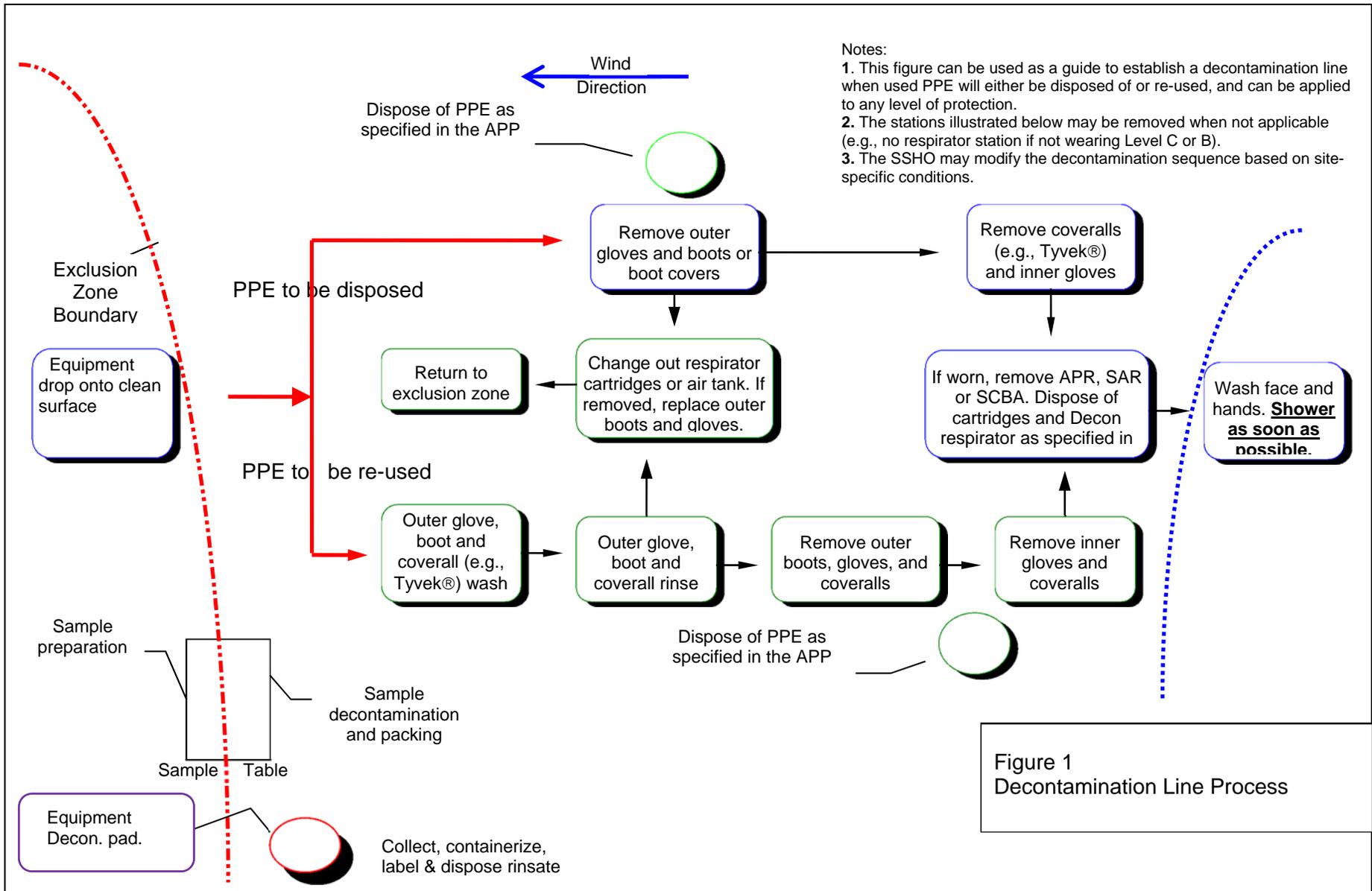
- 1) Eating, drinking, smoking and tobacco use shall only be conducted in designated areas and not in areas where there is any exposure to hazardous material/waste, flammable/combustible liquids and gases may exist;
- 2) Wash hands and face, before eating, drinking, smoking or using tobacco and at the end of the work-shift.
- 3) shower as soon as feasible after completing field activities.

The site supervisor or SSHO shall establish areas for eating, drinking, and smoking at the site so that incident exposure to site COCs does not possibly occur.

### 1.13.1 Decontamination Specifications

When the establishment of an EZ and CRZ is required, the site supervisor or SSHO must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by site supervisor or SSHO. The site supervisor or SSHO must ensure that procedures are established for disposing of materials generated on the site. For this project, the use of Modified Level D and Level C PPE may or may not be required, depending on the actual site conditions that are encountered and whether direct contact with contaminated material is needed to execute site operations. If it is determined that the establishment of decontamination coordinators (i.e. EZ/CRZ) are needed, and respirator cleaning stations will be warranted, than it is essential for workers to maintain good positive personal hygiene practices and proper containerization, labeling, storage, disposal and overall management of spent disposable PPE. Where the establishment of an EZ and CRZ decontamination corridors are required the detail below identifies a typical worker/equipment decontamination sequence. Figure 1, below, graphically represents personnel and equipment decontamination processes.

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none"> <li>- Boot wash/rinse</li> <li>- Glove wash/rinse</li> <li>- Outer-glove removal</li> <li>- Body-suit removal</li> <li>- Inner-glove removal</li> <li>- Respirator removal</li> <li>- Hand wash/rinse</li> <li>- Face wash/rinse</li> <li>- Shower ASAP</li> <li>- Collect, properly containerize, label and dispose of all spent of PPE</li> <li>- Collect, properly containerize, label and dispose of all spent decontamination fluid contain for offsite disposal</li> </ul> <p><b>(Do not dispose of spent PPE or similar waste in government disposal receptacles.)</b></p>	<ul style="list-style-type: none"> <li>- Wash/rinse equipment</li> <li>- Solvent-rinse equipment</li> <li>- Contain solvent waste for offsite disposal</li> <li>- Collect, properly containerize, label and dispose of all spent of decontamination fluid and residual solids for offsite disposal</li> </ul>	<ul style="list-style-type: none"> <li>- Power wash</li> <li>- Steam clean</li> <li>- Collect, properly containerize, label and dispose of all spent of decontamination fluid or residual solids</li> </ul>



## 1.13.2 Equipment Decontamination

The sequence and location of equipment decontamination is defined by Section 1.2 and Figure 1, Decontamination Procedure. Procedures for establishment of site control zones, such as EZ or CRZ, as related to equipment decontamination processes are defined in Sections 1.2.9 through 1.2.9.4 in this SSHSP.

## 1.14 Emergency Equipment and First Aid 28.B.02.m

The requirements for emergency preparedness, equipment and supplies is provided in Section 9.2 "Emergency Response Plans" of the APP and will not be elaborated upon further in this SSHP.

### 1.14.1 Emergency Response and Contingency Procedures 28.B.02.n

The requirements for emergency preparedness, equipment and supplies is provided in Section 9.2 "Emergency Response Plans" of the APP and will not be elaborated upon further in this SSHP.

#### 1.14.1.1 Pre-Emergency Planning 28.B.02.n(1)

The requirements for emergency response and contingency procedures are provided in Section 9.2 "Emergency Response Plans" of the APP and will not be elaborated upon further in this SSHP. The requirements for pre-emergency planning are provided in Section 9.2 "Emergency Response Plans" of the APP and will not be elaborated upon further in this SSHP.

#### 1.14.1.2 Personnel and Lines of Authority - Emergency Situations 28.B.02.n(2)

Personnel and lines of authority for both chain of command and emergency situations are included in section 4.0 "Responsibilities and Lines of Authority" of the APP and will not be elaborated upon further in this SSHP.

#### 1.14.1.3 Criteria and Procedures for Emergency Recognition and Site Evacuation 28.B.02.n(3)

Procedures of emergency recognition and site evacuation is outline in Section 9.2 "Emergency Response Plans" of the APP and will not be elaborated upon further in this SSHP.

#### 1.14.1.4 Decontamination and Medical Treatment of Injured Personnel 28.B.02.n(4)

In the event a worker in an Exclusion Zone (EZ) needs medical assistance primary consideration must be given to remove all site contaminants before transfer of the employee to an uncontaminated area or atmosphere or before being handled by untrained/protected medical response personnel. Decontamination of personnel exposed to site COCs should be decontaminated as quickly as possible via the following procedures:

- After removal from the contaminated area, the exposed individual(s) will be decontaminated by washing the contaminated areas with appropriate decontamination solutions and flushing with potable water. In particular, direct skin (dermal) contact must be addressed via decontamination with soapy water. Decontamination operations must be performed as quick as possible, as time is off the essence in emergency medical situations. Field team personnel shall utilize

disposable PPE wherever possible to promote rapid decontamination of personnel in the EZ.

- If a respirator is used in the EZ, the respirator mask is left on the exposed individual until decontamination has been completed unless it has been determined that areas of the face were contaminated and the mask must be removed to decontaminate.
- After decontamination, the contaminated clothing is removed and skin contamination washed away. If possible, decontamination is completed before the exposure individual is taken to a medical facility.
- ONLY potable water will be used when flushing the eyes or mouth.
- All receptacles used for containing protective clothing shall be equipped with lids that can be closed to prevent the release of contaminants and the introduction of rainfall.
- Initiate first aid and CPR, upon completion of decontamination operations.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 8.0 "Accident Reporting and Investigation" of the APP.
- A map showing the route to the local hospital is shown on Figure 9-2 of the APP and will not be reproduced in this SSHSP.

Note: For CH2M HILL personnel who experience a minor non-life threatening emergency that requires medical attention, please refer to for the "Emergency Nurse Instructions" and "Initial Medical Treatment Form" in Attachment 9 of the APP.

#### **1.14.2 Route Map to Emergency Medical Facilities 28.B.02.n(5 )**

The route map to area emergency medical facilities is provided by Figure 9-1 of Section 9.2.9 "Medical Support" of the APP and need not be reproduced in this SSHP.

#### **1.14.3 Criteria for Alerting Medical Facilities 28.B.02.n(6 )**

There are no specific or unusual hazards [i.e. Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE)] that requires notification to area responders prior to the start of site operations. Any unanticipated medical, fire or security issue that may result during the execution of this

#### **1.14.4 Responsibilities 28.C**

The responsibilities for HAZWOPER regulated activities will be the same as for non-HAWOPER regulated activities. Both project level and AGVIQ-CH2M HILL program level responsibilities for all operations are included in Section 4.0 "Responsibilities and Lines of Authority" of the APP and will not be further elaborated upon in this SSHP.

#### **1.14.5 Training 28.D**

All training requirements for this project are discussed in Section 6.0 "Training" of the APP and will not be elaborated upon further in this SSHP.

#### **1.14.6 Medical Surveillance 28.E**

All worker surveillance requirements for this project are discussed in Section 6.0 "Training" of this APP and will not be elaborated upon further in this SSHP.

#### **1.14.7 RCRA TSD Facilities 28.F**

Not Applicable. The criteria of EM 385 1-1, section 28 are not applicable to the site operations nor are Treatment, Storage and Disposal (TSD) facility conditions under the requirements of 40 CFR 264/265 applicable to this project.

#### **1.14.8 Facility/Construction Project Emergency Response 28.G**

Facility/construction project emergency response emergency procedures is outlined in Section 9.2 "Emergency Response Plans" of the APP and will not be elaborated upon further in this SSHP.

**Attachment 2**  
**Accident Prevention Plan and Site Specific**  
**Health and Safety Plan Acknowledgement Form**

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**Attachment 3**  
**Subcontractor H&S Tracking Form**

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**Attachment 4**  
**Project H&S Forms/Permits**

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## EQUIPMENT INSPECTION FORM

This form will be used to document AGVIQ-CH2M HILL earthmoving equipment inspections. Earthmoving equipment will be inspected each day and shift prior to use. All components will be inspected for damage and proper operation. Any component failing the inspection will be corrected prior to earthmoving equipment use. Check each box after passing inspection and initial bottom of form each day.

Equipment Name: \_\_\_\_\_ Identification #: \_\_\_\_\_ Week of: \_\_\_\_\_

INSPECTION ITEM	Mon	Tue	Wed	Thu	Fri	Sa	Sun
<b>Visual Checks</b>							
Operating manual – present							
Controls - labeled as to their function, visible and legible, safety latches/guards present							
Tires/tracks – proper inflation/tension, not excessively worn or damaged							
Fluid levels/leaks - engine, transmission, hydraulic, radiator, swing motor and PTO oils.							
Lubrication - to the manufacturer's specifications							
Air filter gauge - gauge is not in the red zone.							
Hydraulics – no fluid leaks, connections tight, hoses, cylinders free of damage.							
Hoses/belts – held securely, not loose or rubbing, no excessive wear or crimping							
Fuel system - tank free of damage, all valves/hoses secure, no leaks							
Body & ground-engaging tools – no damage, cracks, bends, or excessive wear.							
Cylinders/articulation joints– no worn pins, loose connections or other damage.							
Roll-over protective structures (ROPS) - no damage, no cracks or bends							
Seat belt/bar – required unless operator stands or no ROPS							
Handrails, steps, platforms – clean, free from grease, oil, clear of obstructions.							
Cab glass – safety glass, clean, no cracks or visible distortion							
Mirrors – properly adjusted, no cracks or visible distortion							
Windshield wipers, fluid, and defroster - functioning							
Machine guards – present and in good condition							
Fire extinguisher – present and charged							
<b>Operational Checks – check items through normal maneuvers</b>							
Horn & back-up alarm – operating and distinguishable from surrounding noise							
Lights, directional signals, and brake lights - functioning							
Gauges/indicators – visible and working properly							
Operating controls - lift and tilt functioning properly							
Outriggers, if present – functioning properly							
Accelerator - even acceleration, does not stick							
Brakes (service & parking) - brings to complete stop, holds in fixed position							
Steering – responsive, minimal looseness							
Exhaust system – guarded if potential for contact, no signs of sparks/leaks							
<b>Inspector's Initials</b>							







# Stop Work Order Form

**REPORT PREPARED BY:**

Name:	Title:	Signature:	Date:

---

**ISSUE OF NONPERFORMANCE**

<b>Description:</b> _____ _____ _____ _____ _____	<b>Date of Nonperformance:</b> _____
---	---

**SUBCONTRACTOR SIGNATURE OF NOTIFICATION:**

Name:	Title:	Signature:	Date:

---

*\* Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.*

**SUBCONTRACTOR'S CORRECTIVE ACTION**

<b>Description:</b> _____ _____ _____ _____ _____	<b>Date of Corrective Actions:</b> _____
---	---

**SUBCONTRACTOR SIGNATURE OF CORRECTION:**

Name:	Title:	Signature:	Date:

**Attachment 5**  
**Emergency Contact List**

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# Emergency Contact List

**24-hour CH2M HILL Serious Incident Reporting Contact/Pager: 720-286-4911**  
**CH2M HILL 24-hour Nurse Number: 866-893-2514**

<ul style="list-style-type: none"> <li>- <b>Medical Emergency – 911</b></li> <li>- <b>Fire – 911</b></li> <li>- <b>Security Emergency – 911</b></li> <li>- <b>Utility Emergency – 911</b></li> </ul>	<p><b>CH2M HILL- Medical Consultant</b>  WorkCare  Dr. Peter Greaney M.D.  300 S. Harbor Blvd, Suite 600  Anaheim , CA 92805  800-455-6155  714-978-7488  (After hours calls will be returned within 20 minutes)  <b>AGVIQ Medical Consultant(s)</b>  Refer to AGVIQ VBO office for a detailed list of Medical Facilities/contacts.</p>
<p><b>AGVIQ-CH2M HILL SBRAC Program Manager</b>  Name: Sidney Allison AGVIQ, LLC  Phone (843) 242-8018 / (843) 813-2672 (cell)</p> <p><b>Project Manager</b>  Name: Amy Twitty, CH2M HILL  Phone: (850)232-0320 (cell)</p>	<p><b>AGVIQ-CH2M HILL SBRAC Deputy Program Manager</b>  Name: Sam Naik, CH2M HILL  Phone: (770) 604-9182 x54248 /(678) 860-9626 (cell)</p>
<p><b>FIELD OPERATIONS-CONTACTS</b></p> <p><b>AGVIQ-CH2M HILL Site Superintendent</b>  Name: To be Determined</p> <p><b>AGVIQ-CH2M HILL Joint Venture Program SSHO</b>  Name: To be Determined</p>	<p><b>AGVIQ-CH2M HILL Program CIH</b>  Name: Angelo Liberatore  Phone: (678) 530-4210/ (770) 335-2076 (cell)</p> <p><b>AGVIQ-CH2M HILL HSPA</b>  Name: Mark Orman  Phone: (414) 847-0597/ (414) 712-4138 (cell)</p> <p><b>AGVIQ-CH2M HILL HSPA</b>  Name: Josh Painter  Cell Phone: (303) 993-9274</p>
<p><b>AGVIQ Corporate Human Resources Department &amp; AGVIQ Worker’s Compensation &amp; Auto Claims</b>  Name: Sabrina Ben  TIKIGAQ Corp. Anchorage, AK  Phone: (907) 365 6129/ (907) 341-6139 (fax)</p> <p>AGVIQ personnel to report all accidents or injuries to AGVIQ Corporate HSM or HSO immediately but no later than 24 hrs. Fatalities and hospitalizations shall require immediate notification to AGVIQ Corporate HSM.</p>	<p><b>CH2M HILL Worker’s Compensation &amp; Auto Claims</b>  Zurich American Ins. Co  1400 American Lane  Schaumburg IL 60196-1056  1 (800) 987-3373</p> <p>Contact Business Group Human Resources Dept. to have form completed or contact Albert Jerman after hours: (303) 741-5927  Rental: Linda Anderson/COR (720) 286-2401  CH2M HILL owned vehicle: Linda George (720) 286-2057  Fatalities and hospitalizations shall require immediate notification to AGVIQ-CH2M HILL Program CIH.</p>
<p><b>AGVIQ Corporate HSM</b>  Name: Troy Izatt  Office phone # (907) 365-6182  Cell phone # (907) 748-3697</p>	<p><b>Federal Express Dangerous Goods Shipping</b>  Phone: (800) 238-5355</p> <p><b>Emergency Number for Shipping Dangerous Goods</b>  Phone: (800) 255-3924</p>
<p><b>Facility Alarms:</b>  Sound vehicle horn three times. (Site 4A)</p>	<p><b>Evacuation Assembly Area(s):</b>  See map posted at site.</p>
<p><b>Facility/Site Evacuation Assembly Area/Route:</b> See map posted at site.</p>	
<p><b>Hospital Name/Address</b> Santa Rose Medical Center , 1450 Berryhill Road, Milton, FL 32570  (850) 626-7762 (See Figure 9-1 of this APP)</p>	

## Emergency Nurse Assistance Instructions (CH2M HILL personnel only)

- After informing their supervisor (AGVIQ-CH2M HILL Project Manager and/or AGVIQ-CH2M HILL Deputy Program Manager), the injured employee calls CH2M HILL's contracted Occupational Nurse.
- 24-hour CH2M HILL Emergency Nurse Assistance (1-866-893-2514)
- The Occupational Injury Nurse listens to the injured employee to understand the injury/illness.
- Employee is provided guidance on appropriate treatment options (triage).
- If instructed to visit a medical facility by the Occupational Injury Nurse, the Supervisor is responsible for instructing the injured employee to take a copy of the **CH2M HILL Initial Medical Treatment Form (Attachment 9- For Use by CH2M HILL Personnel Only)** with them to the physician, clinic or hospital.
- Appropriate treatment details are handled by the Occupational Injury Nurse, and Workers Compensation Groups.
- Nurse communicates and troubleshoots with and for employee through full recovery
- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the AGVIQ-CH2M HILL PM (overall) and AGVIQ-CH2M HILL Program Manager, Project Manager and CIH/HSPA.
- For work-related injuries or illnesses to CH2M HILL personnel, contact and help Human Resources administrator complete a Hours and Incident Tracking System (HITS) Form. HITS must be completed within 24 hours of incident.

For AGVIQ-CH2M HILL subcontractor incidents, complete the IRF, Near Loss Investigation Report and Root Cause Analysis and submit to the AGVIQ-CH2M HILL PM and CIH/HSPA.

**Attachment 6**  
**Material Safety Data Sheets (provided onsite)**

**Attachment 7**  
**Chemical Specific Training Form and**  
**Project Specific Chemical Product Hazard**  
**Communication Form**

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# CHEMICAL-SPECIFIC TRAINING FORM

Location:	Task Order:
SSHO:	Trainer:

## TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

## REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:


The SSHO will use the product MSDS to provide the following information concerning each of the products listed above.

- Physical and health hazards
- Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants will have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and the written hazard communication program will be made available for employee review in the facility/project hazard communication file.



**Attachment 8**  
**Pre-Task Safety Plan**

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Daily Pre-Task Safety Plan (PTSP)

Project: _____		Date: _____
Location: _____		
Superintendent: _____		Site Safety & Health Officer: _____
Job Description:		
Specific Tasks:		
Tools/Equipment Required for Tasks (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools):		
<input type="checkbox"/> Chemical burns/contact	<input type="checkbox"/> Trench, excavations, cave-ins	<input type="checkbox"/> Ergonomics
<input type="checkbox"/> Pressurized lines/equipment	<input type="checkbox"/> Overexertion	<input type="checkbox"/> Chemical splash
<input type="checkbox"/> Thermal burns	<input type="checkbox"/> Pinch points	<input type="checkbox"/> Poisonous plants/insects
<input type="checkbox"/> Electrical	<input type="checkbox"/> Cuts/abrasions	<input type="checkbox"/> Eye hazards/flying projectile
<input type="checkbox"/> Weather conditions	<input type="checkbox"/> Spills	<input type="checkbox"/> Inhalation hazard
<input type="checkbox"/> Heights/fall > 6 feet	<input type="checkbox"/> Overhead Electrical hazards	<input type="checkbox"/> Heat/cold stress
<input type="checkbox"/> Noise	<input type="checkbox"/> Elevated loads	<input type="checkbox"/> Water/drowning hazard
<input type="checkbox"/> Explosion/fire	<input type="checkbox"/> Slips, trip and falls	<input type="checkbox"/> Heavy equipment
<input type="checkbox"/> Radiation	<input type="checkbox"/> Manual lifting	<input type="checkbox"/> Aerial lifts/platforms
<input type="checkbox"/> Confined space entry	<input type="checkbox"/> Welding/cutting	<input type="checkbox"/> Demolition
Other Potential Hazards (Describe):		
<ol style="list-style-type: none"> <li>1) Observe government/military facility posted speed limits.</li> <li>2) Wear seat belts in vehicles and heavy equipment.</li> <li>3) Do not use cell phones or two way radios while driving or actively operating equipment on.</li> <li>4) Report all accidents/injuries and property damage to the Project Manager and HSPA/CIH immediately.</li> <li>5) Maintain hospital route maps in site vehicles. Know facility EMS, Fire and Security dispatch #s.</li> <li>6) Secure any loads to hauling vehicle (pick-up truck) with appropriate rated tie down straps.</li> <li>7) Use reflective vests/ high visibility clothing in high traffic areas or in areas were material handling operations are occurring.</li> </ol>		



Hazard Control Measures (Check All That Apply):			
<p><b><u>PPE</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Thermal/lined</li> <li><input type="checkbox"/> Eye</li> <li><input type="checkbox"/> Dermal/hand</li> <li><input type="checkbox"/> Hearing</li> <li><input type="checkbox"/> Respiratory</li> <li><input type="checkbox"/> Flotation device</li> <li><input type="checkbox"/> Reflective vests</li> <li>Hard hat</li> </ul>	<p><b><u>Protective Systems</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sloping</li> <li><input type="checkbox"/> Shoring</li> <li><input type="checkbox"/> Trench box</li> <li><input type="checkbox"/> Barricades</li> <li><input type="checkbox"/> Competent person</li> <li><input type="checkbox"/> Locate buried utilities</li> <li><input type="checkbox"/> Daily inspections</li> </ul>	<p><b><u>Fire Protection</u></b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Fire extinguishers</li> <li><input type="checkbox"/> Fire watch</li> <li><input type="checkbox"/> Non-spark tools</li> <li><input checked="" type="checkbox"/> Grounding/bonding</li> <li><input type="checkbox"/> Intrinsically safe equipment</li> </ul>	<p><b><u>Electrical</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lockout/tagout</li> <li><input type="checkbox"/> Grounded</li> <li><input type="checkbox"/> Panels covered</li> <li><input checked="" type="checkbox"/> GFCI/extension cords</li> <li><input type="checkbox"/> Power tools/cord inspected</li> </ul>
<p><b><u>Fall Protection</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Harness/lanyards</li> <li><input type="checkbox"/> Adequate anchorage</li> <li><input type="checkbox"/> Guardrail system</li> <li><input type="checkbox"/> Covered opening</li> <li><input type="checkbox"/> Fixed barricades</li> <li><input type="checkbox"/> Warning system</li> </ul>	<p><b><u>Air Monitoring</u></b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> PID/FID</li> <li><input type="checkbox"/> Detector tubes</li> <li><input type="checkbox"/> Radiation</li> <li><input type="checkbox"/> Personnel sampling</li> <li><input type="checkbox"/> LEL/O2</li> <li><input type="checkbox"/> Other</li> </ul>	<p><b><u>Proper Equipment</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Aerial lift/ladders/scaffolds</li> <li><input type="checkbox"/> Forklift/heavy equipment</li> <li><input type="checkbox"/> Backup alarms</li> <li><input type="checkbox"/> Hand/power tools</li> <li><input type="checkbox"/> Crane with current inspection</li> <li><input type="checkbox"/> Proper rigging</li> <li><input type="checkbox"/> Operator qualified</li> </ul>	<p><b><u>Welding &amp; Cutting</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cylinders secured/capped</li> <li><input type="checkbox"/> Cylinders separated/upright</li> <li><input type="checkbox"/> Flash-back arrestors</li> <li><input type="checkbox"/> No cylinders in CSE</li> <li><input type="checkbox"/> Flame retardant clothing</li> <li><input type="checkbox"/> Appropriate goggles</li> </ul>
<p><b><u>Confined Space Entry</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Isolation</li> <li><input type="checkbox"/> Air monitoring</li> <li><input type="checkbox"/> Trained personnel</li> <li><input type="checkbox"/> Permit completed</li> <li><input type="checkbox"/> Rescue</li> </ul>	<p><b><u>Medical/ER</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> First-aid kit</li> <li><input type="checkbox"/> Eye wash</li> <li><input type="checkbox"/> FA-CPR trained personnel</li> <li><input type="checkbox"/> Route to hospital</li> </ul>	<p><b><u>Heat/Cold Stress</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Work/rest regime</li> <li><input type="checkbox"/> Rest area</li> <li><input type="checkbox"/> Liquids available</li> <li><input type="checkbox"/> Monitoring</li> <li><input type="checkbox"/> Training</li> </ul>	<p><b><u>Vehicle/Traffic</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Traffic control</li> <li><input type="checkbox"/> Barricades</li> <li><input type="checkbox"/> Flags</li> <li><input type="checkbox"/> Signs</li> </ul>
<p><b><u>Permits</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Hot work</li> <li><input type="checkbox"/> Confined space</li> <li><input type="checkbox"/> Lockout/tagout</li> <li><input checked="" type="checkbox"/> Excavation</li> <li><input type="checkbox"/> Demolition</li> <li><input type="checkbox"/> Energized work</li> </ul>	<p><b><u>Demolition</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pre-demolition survey</li> <li><input type="checkbox"/> Structure condition</li> <li><input type="checkbox"/> Isolate area/utilities</li> <li><input type="checkbox"/> Competent person</li> <li><input type="checkbox"/> Hazmat present</li> </ul>	<p><b><u>Inspections:</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ladders/aerial lifts</li> <li><input type="checkbox"/> Lanyards/harness</li> <li><input type="checkbox"/> Scaffolds</li> <li><input checked="" type="checkbox"/> Heavy equipment</li> <li><input type="checkbox"/> Cranes and rigging</li> </ul>	<p><b><u>Training:</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Hazwaste</li> <li><input type="checkbox"/> Construction</li> <li><input type="checkbox"/> Competent person</li> <li><input type="checkbox"/> Task-specific (THA)</li> <li><input checked="" type="checkbox"/> HAZCOM</li> <li><input checked="" type="checkbox"/> HAZWOPER</li> </ul>
<p>Field Notes:</p> <p>Distractions, dehydration, uneven ground creates a tripping hazard. Driving and traffic safety.</p>			



**Attachment 9**  
**Loss Prevention Observation Form**

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Loss Prevention Observation Form			
Project:	Observer:		
Position/Title of worker observed:	Background Information/comments:		
Task/Observation Observed:	Date:		
<ul style="list-style-type: none"> <li>- Identify and reinforce safe work practices/behaviors</li> <li>- Identify and improve on at-risk practices/acts</li> <li>- Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards</li> <li>- Proactive PM/Site Manager support facilitates eliminating/reducing hazards (material/personnel resources)</li> <li>- Positive, corrective, cooperative, collaborative feedback/recommendations</li> </ul>			
Actions & Behaviors	Consistent w/ H&S Program	Not Consistent w/ H&S Program	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, AHA, PTSP, tailgate briefing, c., as needed)			<b>Positive Work Practices Observed:</b>
Personnel properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			<b>Questionable Activity/Condition Observed:</b>
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			
Focus/attentiveness			<b>Actions/Comments:</b>
Pace			
Uncomfortable position			
Inconvenient location			
Position/Line of fire			
Apparel (hair, loose clothing, jewelry)			
Repetitive motion			<b>Observed Worker's Corrective Actions/Comments:</b>
Other...			

**Safety and Occupational Health Deficiency Tracking Log**

<b>Item</b>	<b>Date Identified</b>	<b>Identified By</b>	<b>Deficiency Description</b>	<b>Resolution Date</b>	<b>Corrected By</b>	<b>Actual Correction Date</b>
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

**Attachment 10**  
**Incident Report Form**

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# Incident Report Form

### Type of Incident (Select at least one)

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Injury/Illness             | <input type="checkbox"/> Property Damage | <input type="checkbox"/> Spill/Release |
| <input type="checkbox"/> Environmental/Permit Issue | <input type="checkbox"/> Near Miss       | <input type="checkbox"/> Other         |

### General Information (Complete for all incident types)

Preparer's Name: \_\_\_\_\_ Preparer's Employee Number: \_\_\_\_\_  
 Date of Report: \_\_\_\_\_ Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ am/pm

### Type of Activity (Provide activity being performed that resulted in the incident)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Asbestos Work                     | <input type="checkbox"/> Excavation Trench-Haz Waste | <input type="checkbox"/> Other (Specify) _____     |
| <input type="checkbox"/> Confined Space Entry              | <input type="checkbox"/> Excavation Trench-Non Haz   | <input type="checkbox"/> Process Safety Management |
| <input type="checkbox"/> Construction Mgmt- Haz Waste      | <input type="checkbox"/> Facility Walk Through       | <input type="checkbox"/> Tunneling                 |
| <input type="checkbox"/> Construction Mgmt - Non-Haz Waste | <input type="checkbox"/> General Office Work         | <input type="checkbox"/> Welding                   |
| <input type="checkbox"/> Demolition                        | <input type="checkbox"/> Keyboard Work               | <input type="checkbox"/> Wetlands Survey           |
| <input type="checkbox"/> Drilling-Haz Waste                | <input type="checkbox"/> Laboratory                  | <input type="checkbox"/> Working from Heights      |
| <input type="checkbox"/> Drilling-Non Haz Waste            | <input type="checkbox"/> Lead Abatement              | <input type="checkbox"/> Working in Roadways       |
| <input type="checkbox"/> Drum Handling                     | <input type="checkbox"/> Motor Vehicle Operation     | <input type="checkbox"/> WWTP Operation            |
| <input type="checkbox"/> Electrical Work                   | <input type="checkbox"/> Moving Heavy Object         |  |

### Location of Incident (Select one)

- Company Premises (JVI Office: \_\_\_\_\_)
- Field (Project #: \_\_\_\_\_ Project/Site Name: \_\_\_\_\_ Client: \_\_\_\_\_)
- In Transit (Traveling from: \_\_\_\_\_ Traveling to: \_\_\_\_\_)
- At Home

### Geographic Location of Incident (Select region where the incident occurred)

- |                                    |                                    |   |
|------------------------------------|------------------------------------|---|
| <input type="checkbox"/> Northeast | <input type="checkbox"/> Southwest | <input type="checkbox"/> Asia Pacific       |
| <input type="checkbox"/> Southeast | <input type="checkbox"/> Corporate | <input type="checkbox"/> Europe Middle East |
| <input type="checkbox"/> Northwest | <input type="checkbox"/> Canadian  | <input type="checkbox"/> Latin America      |

If an AGVIQ-CH2M HILL subcontractor was involved in the incident, provide their company name and phone number:

\_\_\_\_\_

Describe the Incident (Provide a brief description of the incident): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Injured Employee Data (Complete for Injury/Illness incidents only)

If AGVIQ-CH2M HILL employee injured

Employee Name: \_\_\_\_\_ Employee Number: \_\_\_\_\_

If AGVIQ-CH2M HILL Subcontractor employee injured

Employee Name: \_\_\_\_\_ Company: \_\_\_\_\_

## Injury Type

- Allergic Reaction
- Amputation
- Asphyxia
- Bruise/Contusion/Abrasion
- Burn (Chemical)
- Burn/Scald (Heat)
- Cancer
- Carpal Tunnel
- Concussion
- Cut/Laceration
- Dermatitis
- Dislocation

- Electric Shock
- Foreign Body in eye
- Fracture
- Freezing/Frost Bite
- Headache
- Hearing Loss
- Heat Exhaustion
- Hernia
- Infection
- Irritation to eye
- Ligament Damage

Multiple (Specify) \_\_\_\_\_

- Muscle Spasms
- Other (Specify) \_\_\_\_\_

- Poisoning (Systemic)
- Puncture
- Radiation Effects
- Strain/Sprain
- Tendonitis
- Wrist Pain

## Part of Body Injured

- Abdomen
- Ankle(s)
- Arms (Multiple)
- Back
- Blood
- Body System
- Buttocks
- Chest/Ribs
- Ear(s)
- Elbow(s)
- Eye(s)
- Face
- Finger(s)

- Foot/Feet
- Hand(s)
- Head
- Hip(s)
- Kidney
- Knee(s)
- Leg(s)
- Liver
- Lower (arms)
- Lower (legs)
- Lung
- Mind

- Multiple (Specify) \_\_\_\_\_
- Neck
- Nervous System
- Nose
- Other (Specify) \_\_\_\_\_

- Reproductive System
- Shoulder(s)
- Throat
- Toe(s)
- Upper Arm(s)
- Upper Leg(s)
- Wrist(s)

## Nature of Injury

- Absorption
- Bite/Sting/Scratch
- Cardio-Vascular/Respiratory

### System Failure

- Caught In or Between
- Fall (From Elevation)
- Fall (Same Level)
- Ingestion

- Inhalation
- Lifting
- Mental Stress
- Motor Vehicle Accident
- Multiple (Specify) \_\_\_\_\_

Other (Specify) \_\_\_\_\_

- Overexertion
- Repeated Motion/Pressure
- Rubbed/Abraded
- Shock
- Struck Against
- Struck By
- Work Place Violence

• Initial Diagnosis/Treatment Date: \_\_\_\_\_

## Type of Treatment

- Admission to hospital/medical facility
- Application of bandages
- Cold/Heat Compression/Multiple Treatment
- Cold/Heat Compression/One Treatment
- First Degree Burn Treatment
- Heat Therapy/Multiple treatment
- Multiple (Specify) \_\_\_\_\_

- Heat Therapy/One Treatment
- Non-Prescriptive medicine
- None
- Observation
- Other (Specify) \_\_\_\_\_

- Prescription- Multiple dose
- Prescription- Single dose
- Removal of foreign bodies
- Skin Removal
- Soaking therapy- Multiple Treatment
- Soaking Therapy- One Treatment
- Stitches/Sutures

- Tetanus
- Treatment for infection
- Treatment of 2<sup>nd</sup> /3<sup>rd</sup> degree burns
- Use of Antiseptics - multiple treatment
- Use of Antiseptics - single treatment
- Whirlpool bath therapy/ multiple treatment
- Whirlpool bath therapy/ single treatment
- X-rays negative
- X-rays positive/treatment of fracture

Number of days doctor required employee to be off work: \_\_\_\_\_  
Number of days doctor restricted employee's work activity: \_\_\_\_\_  
Equipment Malfunction: Yes  No  Activity was a Routine Task: Yes  No   
Describe how you may have prevented this injury:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

<u>Physician Information</u>	<u>Hospital Information</u>
Name: _____	Name: _____
Address: _____	Address: _____
City: _____	City: _____
Zip Code: _____	Zip Code: _____
Phone: _____	Phone: _____

**Property Damage** (Complete for Property Damage incidents only)

Property Damaged: \_\_\_\_\_ Property Owner: \_\_\_\_\_  
Damage Description: \_\_\_\_\_  
Estimated Amount: \$ \_\_\_\_\_

**Spill or Release** (Complete for Spill/Release incidents only)

Substance (attach MSDS): \_\_\_\_\_ Estimated Quantity: \_\_\_\_\_  
Facility Name, Address, Phone No.: \_\_\_\_\_

Did the spill/release move off the property where work was performed?:  
\_\_\_\_\_

Spill/Release From: \_\_\_\_\_ Spill/Release To: \_\_\_\_\_

**Environmental/Permit Issue** (Complete for Environmental/Permit Issue incidents only)

Describe Environmental or Permit Issue:  
\_\_\_\_\_

Permit Type: \_\_\_\_\_

Permitted Level or Criteria (e.g., discharge limit): \_\_\_\_\_

Permit Name and Number (e.g., NPDES No. ST1234): \_\_\_\_\_

Substance and Estimated Quantity: \_\_\_\_\_

Duration of Permit Exceedance: \_\_\_\_\_

**Verbal Notification** (Complete for all incident types)(Provide names, dates and times)

AGVIQ-CH2M HILL Personnel Notified: \_\_\_\_\_  
Client Notified: \_\_\_\_\_

# Root Cause Investigation

This attachment is provided to assist in accessing, completing, and reviewing an incident investigation. It is important to remember the following when conducting an investigation:

Gather relevant facts, focusing on fact-finding, not fault-finding.  
Draw conclusions, pitting facts together into a probable scenario.  
Determine incident root cause(s), the basic causes why an unsafe act/condition existed.  
Develop and implement solutions, matching all identified root causes with solutions.

## **Documentation**

The following should be included in the Incident Report Form (IRF) to document the incident.

## **Description**

Provide a description of the event and the sequence of events and actions that took place prior to the incident. Start with the incident event and work backwards in time through all of the preceding events that directly contributed to the incident. The information should identify why the event took place as well as who was involved, when and where the event took place, and what actions were taken.

## **Cause Analysis**

Using the form and flowchart in this attachment the root cause of the incident will be determined. This form must be retained in the project and/or regional HS&E files.

**Immediate Causes**—List the substandard actions or conditions that directly affected the incident. The following are examples of immediate causes:

***Substandard Actions:*** Operating equipment without authority; failure to warn; failure to secure; operating at improper speed; making safety device inoperable; using defective equipment; failing to use PPE; improper loading; improper lifting; improper position for task; under influence of alcohol or drugs; horseplay.

***Substandard Conditions:*** Exposure to hazardous materials; exposure to extreme temperatures; improper lighting; improper ventilation; congestion; exposure to fire and explosive hazard; defective tools, equipment or materials; exposure to extreme noise; poor ventilation; poor visibility; poor housekeeping.

**Basic Causes**—List the personal and job factors that caused the incident. The following are examples of basic causes:

***Personal Factors:*** Capability; knowledge; skill; stress; motivation.

***Job Factors:*** Abuse or misuse; engineering; maintenance; purchasing; supervision; tools and equipment; wear and tear; work standards.

## **Corrective Action Plan**

Include all corrective actions taken or those that should be taken to prevent recurrence of the incident. Include the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a time frame for completion. Be sure the corrective actions address the causes. For example, training may prevent recurrence of an incident caused by a lack of knowledge, but it may not help an incident caused by improper motivation.

The following are examples of management programs that may be used to control future incidents. These programs should be considered when determining specific corrective actions.

***Management Programs:*** Accident/incident analysis; emergency preparedness; engineering controls; general promotion; group meetings; health control; hiring and placement; leadership and administration; management training; organizational rules; personal protective equipment; planned inspections; program audits; program controls; purchasing controls; task analysis and procedures; task observation.



# Loss/Near-Loss Investigation Report Form

## Employer Information

Company Name: \_\_\_\_\_

Project Name: \_\_\_\_\_ Task Order: \_\_\_\_\_

Project Location: \_\_\_\_\_

Task Location: \_\_\_\_\_

Job Assignment: \_\_\_\_\_

Preparer's Name: \_\_\_\_\_ Preparer's Employee Number: \_\_\_\_\_

## Incident Specific Information

Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ a.m./p.m.

Location of incident:

Company premises

Field

Other: \_\_\_\_\_

In Transit

\_\_\_\_\_

Address where the incident occurred: \_\_\_\_\_

Equipment Malfunction: Yes  No

Activity was a Routine Task: Yes  No

Describe any property damage: \_\_\_\_\_

Specific activity the employee was engaged in when the incident occurred:

\_\_\_\_\_

\_\_\_\_\_

All equipment, materials, or chemicals the employee was using when the incident occurred:

\_\_\_\_\_

\_\_\_\_\_

Describe the specific incident and how it occurred:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Describe how this incident may have been prevented:

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Contributing Factors (Describe in detail why incident occurred):

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Date employer notified of incident: \_\_\_\_\_ To whom reported: \_\_\_\_\_

**Witness Information (First Witness)**

Name: \_\_\_\_\_  
Employee Number \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code : \_\_\_\_\_  
Phone: \_\_\_\_\_

**Witness Information (Second Witness)**

Name: \_\_\_\_\_  
Employee Number \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code : \_\_\_\_\_  
Phone: \_\_\_\_\_

Additional information or comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**A ROOT CAUSE ANALYSIS FORM MUST BE COMPLETED FOR ALL INJURIES AND ILLNESSES OR ACTUAL LOSSES.**

**COMPLETION OF THE ROOT CAUSE ANALYSIS FORM FOR NEAR LOSSES IS OPTIONAL, AT THE DISCRETION OF THE HEALTH AND SAFETY MANAGER.**

## Determination of Root Cause(s)

For losses or near losses the information may be gathered by the supervisor or other personnel immediately following the loss or near loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, to determine the root cause, and to develop recommendations. More complex situations may require the investigation team to revisit the loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

The investigation team must use the Root Cause Analysis Flow Chart to assist in identifying the root cause(s) of a loss. Any loss may have one or more “root causes” and “contributing factors”. The “root cause” is the primary or immediate cause of the incident, while a “contributing factor” is a condition or event that contributes to the incident happening, but is not the primary cause of the incident. Root causes and contributing factors that relate to the *person* involved in the loss, his or her peers, or the supervisor should be referred to as “personal factors”. Causes that pertain to the *system* within which the loss or injury occurred should be referred to as “job factors”.

### Personal Factors

1. Lack of skill or knowledge, lack of motivation
5. Correct way takes more time and/or requires more effort
6. Short-cutting standard procedures is positively reinforced or tolerated
7. Person thinks that there is no personal benefit to always doing the job according to standards

### Job Factors

2. Lack of or inadequate operational procedures or work standards.
3. Inadequate communication of expectations regarding procedures or standards
4. Inadequate tools or equipment

### Other

8. Uncontrollable Factors \*

The root cause(s) could be any one or a combination of these seven possibilities or some other “uncontrollable factor”. In the vast majority of losses, the root cause is very much related to one or more of these seven factors. \* **Uncontrollable factors should be used rarely and only after a thorough review eliminates “all” seven other factors.**

# Root Cause Analysis Form

## Root Cause Analysis (RCA)

Root Cause Categories (RCC): Select the RCC numbered below that applies for the root cause (RC) and/or contributing factor (CF) in the first column, then describe the specific root cause and corrective actions in each column.

1. Lack of skill or knowledge
2. Lack of or inadequate operational procedures or work standards
3. Inadequate communication of expectations regarding procedures or work standards
4. Inadequate tools or equipment
5. Correct way takes more time and/or requires more effort
6. Short-cutting standard procedures is positively reinforced or tolerated
7. Person thinks there is no personal benefit to always doing the job according to standards
8. Uncontrollable Factor (Note: Uncontrollable factors should be used rarely and only after a thorough review eliminates "all" seven other factors.)

RCC #	Root Cause(s)	Corrective Actions	RC <sup>1</sup>	CF <sup>2</sup>	Due Date	Completion Date	Date Verified

<sup>1</sup> RC = Root Cause; <sup>2</sup> CF = Contributing Factors (check which applies)

## Investigation Team Members

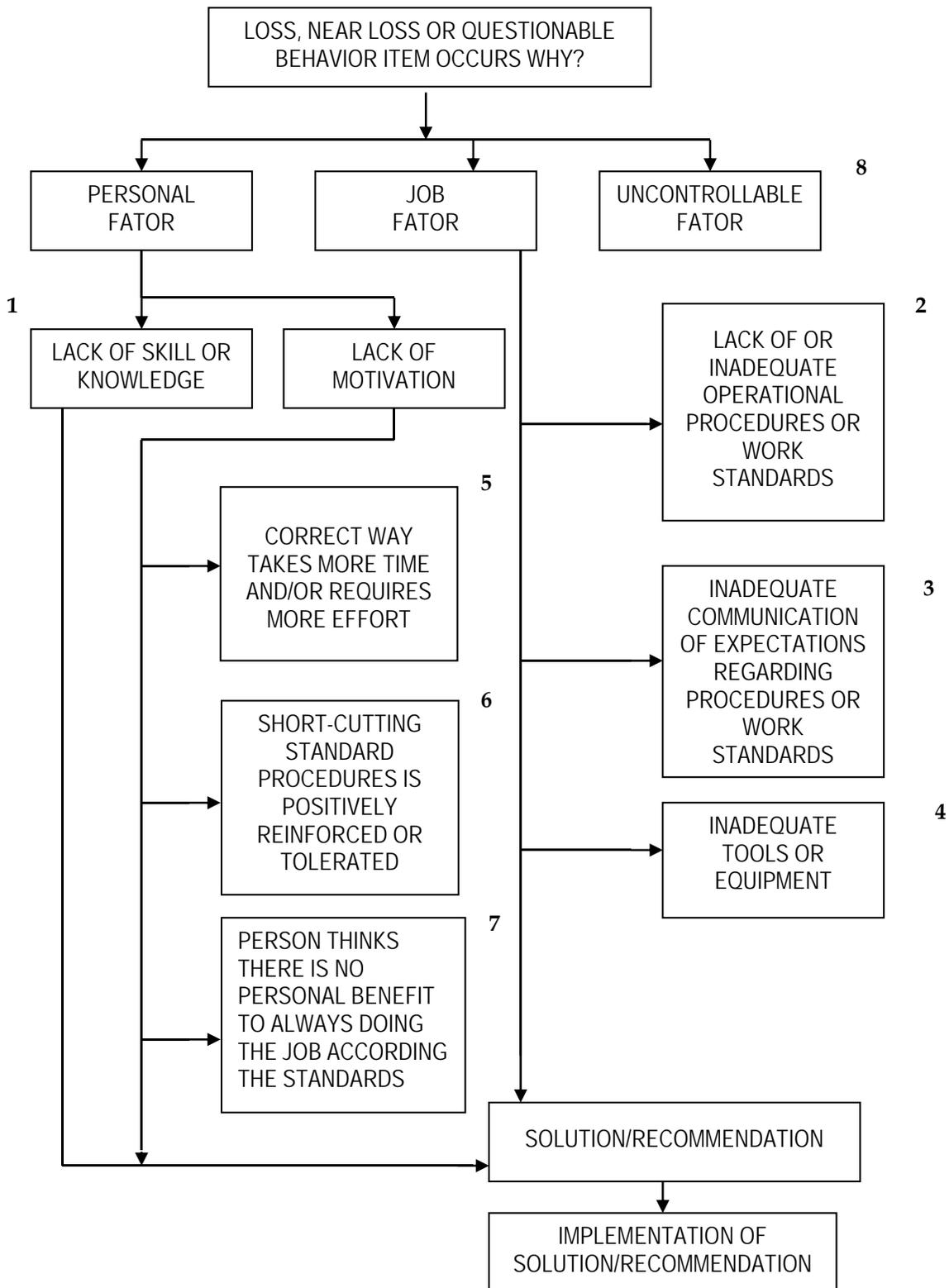
Name	Job Title	Date

## Results of Solution Verification and Validation


## Reviewed By

Name	Job Title	Date

# Root Cause Analysis Flow Chart



**CH2MHILL****INITIAL MEDICAL TREATMENT FORM**

*To be completed by CH2M HILL Supervisor – Send with employee visiting medical facility or forward within 24 hours.*

Employee name: \_\_\_\_\_ Date of Injury: \_\_\_\_\_  
 Supervisor: \_\_\_\_\_ HS  
 Representative: \_\_\_\_\_  
 Visit Authorized by: \_\_\_\_\_ Phone #: \_\_\_\_\_

CH2M HILL Workers Compensation Administrator: Cambridge  
 Send Bills to: CH2M HILL  
 Attn: Jennifer Rindahl  
 P.O. Box 22508  
 Denver, Colorado 80222-0508

*To be completed by medical provider:*

Physician's name: \_\_\_\_\_ Phone #: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 CH2M HILL employee: \_\_\_\_\_ has been treated for: \_\_\_\_\_

**It is the policy of CH2M HILL to provide temporary modified duty whenever possible for employees with physical restrictions resulting from an occupational injury or illness.**

- Released to full duty
- Released to restricted duty only (list restrictions below)
- Out of work until \_\_\_\_\_ (date)

Please list any physical restrictions:

\_\_\_\_\_

\_\_\_\_\_

Expected duration of restricted duty?

\_\_\_\_\_

**CH2M HILL would like the best and most efficient care extended to all our employees. Please recommend over-the-counter (OTC) medication as a suitable alternative when medically feasible.**

Prescribed medication: \_\_\_\_\_  
 Recommended OTC alternative: \_\_\_\_\_

Date of follow-up appointment: \_\_\_\_\_

Physician's signature: \_\_\_\_\_ Date: \_\_\_\_\_

*Please return this form to the injured employee and FAX to Health Resources at 1-800-853-2641. If you want to discuss the employee's work restrictions, please call the person listed in the "Visit Authorized by" field.*

**Attachment 11**  
**Hurricane Preparedness Plan**  

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**(RESERVED)**

Appendix B  
Waste Management Plan

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# Waste Management Plan

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The Waste Management Plan addresses the management and disposal requirements for wastes generated during pilot study activities. It is anticipated that the following wastes will be generated during these activities and stored in drums:

- Liquids from condensate and decontamination activities
- Sampling-related waste including, but not limited to, gloves, and protective clothing
- Clean and uncontaminated construction debris; debris includes discarded materials generally considered to be not water-soluble including, but not limited to, materials used in piping and system installation materials as well as materials used in decontamination (e.g., plastic sheeting, sampling materials and personal protective clothing)

## 1.0 Waste Characterization

Wastes will be characterized according to the Sampling and Analysis Plan located in Section 4.0 of the Enhanced In Situ Biofilter Pilot Study Work Plan. Waste characterization information is typically included on a waste profile form provided by the offsite disposal facility. It is assumed that wastes generated from project activities will be characterized as non-hazardous petroleum-contaminated waste. AGVIQ-CH2M HILL will provide analytical data from the most recent characterization sampling and analysis event.

Waste characterization information for wastes will be documented on a waste profile form provided by the offsite disposal facility as part of the waste acceptance process. The profile will be reviewed and approved by the AGVIQ-CH2M HILL Waste Transportation and Disposal Coordinator prior to submission to the Navy for generator signature. Where generator certification and/or signature are required, Navy personnel will provide. The signed profile will then be submitted to the disposal facility for approval.

The profile typically requires the following information at a minimum:

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/ mailing address
- Process generating waste
- Source of contamination
- Historical use for area
- Waste composition (e.g., 95 percent soil, 5 percent debris)
- Physical state of waste (solid, liquid, etc.)

A facility-approved copy of the waste profile will be received prior to scheduling of offsite transportation of the waste.

## 1.2 Liquid Waste

Liquid waste generated from the SVE knock out drum will be placed in a portable tank. Liquid wastes generated from decontamination activities will be placed into 55-gallon drums or portable tanks for temporary accumulation. AGVIQ-CH2M HILL will collect representative samples of the liquid wastes for waste characterization. Waste samples will be sent to the laboratory and analyzed using EPA SW-846 methods for CI, VOCs, SVOCs, pesticides, herbicides, and Resource Conservation and Recovery Act (RCRA) 8 metals. Analytical methods and sampling procedures are included in the Enhanced In Situ Biofilter Pilot Study Work Plan, Section 4.0 Sampling and Analysis Plan.

## 2.0 Waste Management

### 2.1 Waste Storage Time Limit

As required by Chapter 62-780 FAC, petroleum-contaminated soil (including excessively contaminated soil) will not be stored or stockpiled onsite for more than 60 days. However, petroleum-contaminated soil (including excessively contaminated soil) may be contained in watertight drums and stored onsite for 90 days, after which time proper treatment or proper disposal of the contaminated soil will occur. Other wastes will be removed from the site as soon as practical.

The debris (biofilter construction debris, etc.) is considered non-hazardous and will be removed from the site as soon as practical but within 90 days. However, it is anticipated that materials left over from the biofilter installation activities are natural materials (soil) that could be spread on the site surface without creating a major change to the landscape. The date of generation (or accumulation start date) is the day that a waste is first placed in a container (drum or roll-off), tank, or stockpile.

### 2.2 Labels

The labeling of waste containers will be in accordance with 49 CFR 172, 173 and 178. Labels will include the type of waste, location from which the waste was generated, and accumulation start date. Containers used to store or accumulate waste (including decontamination water) will include one of the following labels:

- “Analysis Pending” or “Waste Material” - This is a temporary pre-printed or handwritten label used until analytical results are received and reviewed. This label will include the accumulation start date. Once data is reviewed and a waste classification determined, one of the following labels will replace this label.
- “Non-Hazardous Waste” - Preprinted labels with the following information:
  - Generator name and contact information
  - Accumulation start date
  - Waste-specific information (e.g., contaminated soil)
- “Hazardous Waste” - Pre-printed hazardous waste labels with the following information:
  - Accumulation start date
  - Generator name and contact information
  - EPA ID number

- RCRA and state waste codes
- Proper DOT shipping name
- Prior to transport, the manifest number must be added (for containers of less than 110-gallon capacity)

Where applicable, the major hazards (e.g., flammable, oxidizer, and carcinogen) will be included on the label.

## 2.3 General Waste Management Requirements

Hazardous wastes, if generated, will be segregated from non-hazardous wastes. Additionally, incompatible wastes (e.g., flammable and corrosive wastes) will be segregated. Wastes of the same matrix, contamination, and the same source may be aggregated to facilitate storage and disposal.

Wastes will be accumulated in an area identified or approved by the Navy. If an accumulation area is not designated, AGVIQ-CH2M HILL will accumulate wastes in an area that is not accessible to the general public, and that can be secured.

Waste accumulation areas will contain appropriate emergency response equipment. The APP (Appendix A) identifies the specific emergency response procedures and equipment. Hazardous waste accumulation areas will include fire extinguishers (in areas where wastes are known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff, including subcontractors, working in accumulation area). Spill control equipment (e.g., sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.

All containers will be inspected upon arrival at the site for equipment in disrepair and any contamination or contents. If container contains waste upon arrival or is in disrepair, it will be immediately rejected and documented.

Solid and liquid wastes will be containerized and the containerized wastes will be stored in accordance with all applicable rules and regulations until treated and/or disposed of offsite. Solid and liquid wastes will be disposed of at offsite facilities approved to receive the wastes. Documentation of the transport and disposal of wastes offsite will be provided.

## 2.4 Drums/Small Containers

The following requirements apply to drums and small containers:

- Drums and small containers of hazardous waste will be transported to the temporary accumulation areas.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Only new, water tight drums will be used. Do not use reconditioned drums purchased from an outside source. It is acceptable to reuse new drums from the site that are in good condition and have been steam cleaned. The insides and outsides of the drums must be free of any residues.

- No penetrating dents are allowed that could affect the integrity of the drum. Pay special attention to any dents at the drum seams. Use the highest level of integrity standards for drums intended to contain liquids.
- If any containers are rusted or have creases, they must be replaced so the drums will not have the opportunity to leak.
- Drum will have UN approval numbers embossed on the bottom or stenciled on the side (“1A2/Y1.7/150” for liquids and “1A2/X425/S” for solids).
- Containers must be compatible with the type of waste being stored in them.
- Drums should be removable-head-type drums without bungs. Bung holes in the lid are acceptable for special applications, but bung holes in the side of the drum are never acceptable.
- All bungs must be tight.
- Adequate aisle space (e.g., 30 inches) will be provided for containers such as 55-gallon drums to allow the unobstructed movement of personnel and equipment. A row of drums should be no more than two drums wide.
- Each drum will be provided with its own label, and labels will be visible.
- Drums will remain closed except when removing or adding waste to the drum. Covers will be properly secured at the end of each workday. Closed means that the lid and/or bung must be on and securely tightened (except with adding or removing waste)
- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.
- Drums containing liquids or hazardous waste will be provided with secondary containment and will not be located near a storm water inlet or conveyance.

## 2.7 Inspection of Waste Storage Areas

Waste accumulation areas will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release. At least weekly, containers will be inspected for leaks, signs of corrosion, or signs of general deterioration.

Deficiencies observed or noted during inspection will be documented and rectified immediately. Appropriate measures may include transfer of waste from leaking container to new container, replacement of liner or cover, or repair of containment berm.

Inspections will be recorded in the daily Quality Control Report (QCR) and include any deficiencies and how the issue was rectified. Copies of the report will be maintained onsite and available for review.

If operations are suspended for more than 7 days, the regulatory compliance manager will be contacted and alternate inspection arrangements will be made. Prior to demobilization, all wastes will be removed from the site.

### 3.0 Security/Emergency Response

A barrier, such as barricade tape or temporary fencing, will be provided for hazardous/dangerous waste accumulation areas, and for other waste storage areas that are accessible to the general public. Hazardous waste storage areas will also have signs that provide 24-hour emergency contacts and telephone numbers.

Waste accumulation areas will contain emergency response equipment appropriate to the wastes' hazards. **The Health and Safety Plan identifies the project emergency response procedures and equipment, including emergency response contacts and phone numbers.**

In addition to the Health and Safety Plan procedures, hazardous waste accumulation areas will be provided with fire extinguishers (for wastes known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in accumulation area). Spill control equipment (e.g., sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.

### 4.0 Employee Training

Field staff that will manage hazardous or dangerous waste will meet the training requirements of WAC 173-303-330 through the following:

- OSHA 1910.120 HAZWOPER training, and
- Online, internal training including the following:
  - Dangerous goods
  - Waste management
  - Remediation waste management
- On-the-job training which includes:
  - Site-specific Health and Safety Plan review – requires each site worker, and guests to review and sign the plan
  - Activity hazard analysis and daily “tailgate” meetings
  - Project-specific Work Plan review; e.g., this Waste Management Plan

### 5.0 Shipping Documentation

Prior to offsite disposal of any waste, AGVIQ-CH2M HILL will provide the Navy with a waste approval package for each waste stream. This package will include a waste profile naming the U.S. Navy as the generator of the waste, analytical summary table(s) applicable to the waste, a completed waste manifest, and any other applicable information necessary for the Navy to complete its review of the disposal package and sign as the generator.

The signed profile will then be submitted to the treatment, storage, and disposal facility (TSDF) for acceptance. Once the approval letter is received from the TSDF, transportation can be scheduled.

Each load of waste material will be manifested prior to leaving the site. The manifest form will include the following information:

- Generator information including name, address, contact, and phone number, EPA ID number
- Transporter information including name, address, contact, and phone number, EPA ID number
- Facility information including name, address, phone number, EPA ID number
- Site name including street/ mailing address
- U.S. Department of Transportation proper shipping name
- Type and number of container
- Quantity of waste (volumetric estimate)
- TO or job number
- Profile number
- 24-hour emergency phone number

Additionally, each shipment of waste will also have a weight ticket. A Land Disposal Restriction (LDR) Notification/Certification is also required for hazardous wastes. This form also requires the generator signature and submission to the disposal facility.

The generator (Navy) and the transporter must sign the manifest prior to the load of waste leaving the site. A copy of the manifest will be retained on site and included with the daily QCR. The original signed manifest will be returned to the address of the generator. The facility will provide a copy of this signed manifest to AGVIQ-CH2M HILL for the final report. The final report will include copies of the facility signed manifest, weight ticket, LDR (if applicable), and the Certificate of Disposal/Destruction/Recycle.

## 6.0 Transportation

Each transportation vehicle and load of waste will be inspected and documented before leaving the site. The quantities of waste leaving the site will be recorded, at a minimum, on the Transportation and Disposal (T&D) Log (Attachment 1). A transporter licensed for commercial transportation will transport non-hazardous wastes. A copy of the documentation indicating that the selected transporter has appropriate licenses will be received and approved by AGVIQ-CH2M HILL prior to transport of any waste.

### 6.1 Transporter Responsibilities

The transporter will be responsible for weighing loads at a certified scale. For each load of material, weight measurements will be obtained for each full and empty container. Disposal quantities will be based on the difference of weight measurements between the full and empty container. Weights will be recorded on the waste manifest. The transporter will provide copies of weight tickets to AGVIQ-CH2M HILL.

The transporter will observe the following practices when hauling and transporting wastes offsite:

- Minimize impacts to general public traffic.
- Repair road damage caused by construction and/or hauling traffic.
- Clean up waste spilled in transit.
- Line and cover trucks/trailers used for hauling contaminated waste to prevent releases and contamination.
- Decontaminate vehicles prior to re-use, other than hauling contaminated waste.
- Seal trucks transporting liquids.

All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the APP (Appendix A of the Work Plan).

No materials from other projects will be combined with materials from NAS Whiting Field.

## 6.2 Disposal of Waste Streams

Offsite treatment or disposal facilities will use the waste profile and supporting documentation (e.g., analytical data) to determine if they will accept a waste.

Non-hazardous wastes will be disposed at an offsite RCRA Subtitle D facility permitted to receive such wastes.

Aqueous wastes (i.e., groundwater) will be disposed of offsite at a facility permitted to accept the waste.

Uncontaminated construction debris may be sent to municipal landfills, or landfills designated for construction/demolition debris. Note all uncontaminated trash will be placed into AGVIQ-CH2M HILL-provided or base-provided dumpsters. No waste of any type will be placed into dumpsters not belonging to AGVIQ-CH2M HILL or the base.

The treatment or disposal facility will be responsible for providing a copy of the final waste manifest and for a certificate of treatment or disposal for each load of waste received.

## 6.3 Transportation and Disposal Log

The T&D Log is used to track waste from generation to final disposition. Wastes will be logged into the T&D Log the day waste is generated and placed into containers.

Transportation of wastes will be inventoried the day of transportation from the site using the T&D Log. Final disposal will be documented on the T&D Log using the Certificate of Disposal. A blank T&D Log is in Attachment 1.

## 7.0 Records/Reporting

The following records and documents will be maintained:

- Transportation and offsite disposal records, including:
  - Profiles and associated characterization data
  - Manifests, LDR notifications/certifications, bills of lading, and other shipping records
  - Offsite facility waste receipts, certificates of disposal/destruction

- Training records
- Inspection records

AGVIQ-CH2M HILL will maintain Material Data Safety Sheets (MSDSs) for chemicals and/or hazardous materials brought onsite, including the MSDSs for chemicals brought onsite by subcontractors.

**Attachment 1**  
**Transportation and Disposal Log**

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Appendix C  
Environmental Protection Plan

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# Environmental Protection Plan

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The purpose of this Environmental Protection Plan is to provide specific requirements and procedures to protect the environment during the enhanced in situ biofilter pilot study.

## 1.0 Regulatory Drivers

This project is regulated under the FDEP Petroleum Cleanup Program. Work will be conducted in accordance with Chapter 62-780 FAC.

Management of petroleum contaminated wastes will comply with the provisions of Chapter 62-780 FAC, Petroleum Contamination Site Cleanup Criteria, as appropriate.

## 2.0 Spill Prevention

The provisions for spill prevention and control establish minimum site requirements. All spills will be reported to the AGVIQ-CH2M HILL Project QC Manager and/or Project Manager. Refer to the APP (Appendix A of the Work Plan) for emergency response procedures and further reporting requirements.

All fuel, chemical, and waste storage areas will be properly protected from onsite and offsite vehicle traffic. All tanks (including fuel storage) must be equipped with secondary containment. These tanks must be inspected daily for signs of leaks. Accumulated water must be inspected for signs of contamination (for example, product sheen, discoloration, and odor) before being discarded. Fire protection provisions outlined in the APP (Appendix A) must be adhered to.

Chemical products must be properly stored, transferred, and used. Should chemical product use occur outside areas equipped with spill control materials, adequate spill control materials must be maintained at the local work area.

## 3.0 Spill Containment and Control

Spill control materials will be maintained in the support zone, at fuel storage and dispensing locations, and at waste storage areas. Incidental spills will be contained with sorbent and disposed of properly. Spilled materials must be immediately contained and controlled. Spill response procedures include:

- Immediately warn any nearby workers and notify supervisor.
- Assess the spill area to ensure that it is safe to respond.
- Evacuate area if spill presents an emergency.
- Ensure any nearby ignition sources are immediately eliminated.
- Stop source of spill.
- Establish site control for spill area.
- Contain and control spilled material using sorbent booms, pads, or other material.
- Use proper personal protective equipment (PPE) in responding to spills.

## 4.0 Spill Cleanup and Removal

All spilled material, contaminated sorbent, and contaminated media will be cleaned up and removed as soon as practical. Contaminated spill material will be contained, labeled, and properly stored until the material is disposed. Contaminated spill material will be managed as waste and disposed according to applicable, federal, state, and local requirements. In the event of a hazardous substance spill or release, the AGVIQ-CH2M HILL representative will immediately notify NAS Whiting Field personnel.

## 5.0 Erosion and Sediment Control

During in situ biofilter trench construction at Site 4, AGVIQ-CH2M HILL will adhere to the following practices for those activities that have the potential to disturb the land:

- Temporary erosion and sediment controls will be used as needed to control sediment release from the site. Structural controls may include the use of straw bales or silt fences.
- Material staging areas will be managed in a manner that controls runoff.
- As needed, sediment tracking will be prevented by washing/ decontaminated vehicle tires prior to entering paved roads. Alternatively, sediment tracked onto paved roads will be swept or otherwise cleaned off at least daily.

Throughout the duration of this project, it is anticipated that less than 1 acre will be disturbed; therefore, coverage under FDEP's Generic Permit for Stormwater Discharge from Large and Small Construction Activities is not required. Erosion and sediment controls will be installed prior to, and maintained during land disturbing activities.

## 6.0 Natural Resource Protection

### 6.1 Protection of Air Resources

The installation and operation of the remedial system, the site will be managed in a manner that minimizes the discharge of air pollutants. The following general practices will be implemented to protect air resources:

- Equipment will be maintained within manufacturer's design limits to ensure minimal discharge of exhaust emissions.
- Dust emissions will be controlled as needed during earth disturbing activities by the spray nozzle application of water.
- Traffic routes will be designated to remain on paved surfaces.
- Completed areas will be seeded or otherwise stabilized to reduce dust levels.
- Burning will not be allowed as a means of clearing.
- Equipment will be operated in such a manner as to minimize airborne particulates whenever possible.

## 6.2 Oil and Fuel Spills

Heavy equipment used in support of this project presents a potential source of petroleum, oil, and lubricants (POL) releases to stormwater runoff. Equipment will be inspected daily for leaks to help prevent releases. Spill response kits containing absorbent pads will be stationed nearby in the event of a leak from equipment to contain any release and limit the potential for subsurface impacts. If a spill or leak occurs, the notification procedures in the APP will be immediately implemented. If equipment is being operated immediately adjacent to a storm drain catch basin, berms or other devices will be proactively placed around or over the catch basin as a precaution.

## 6.3 Oil and Fuel Storage

The storage of gasoline, diesel fuel, grease, and lubricating oils on site will be minimal for these field activities. Re-fueling and minor servicing activities for the vehicles and equipment may be conducted on site. The following controls will be implemented as appropriate:

- Drip pans will be used, when feasible, when transferring gasoline, diesel fuel, grease, lubricating oils, and other potential pollutants.
- Vehicles and equipment will be maintained in good use to prevent the potential for leaks.
- Nearby storm drains will be covered for maintenance, fueling, and servicing activities that are conducted near storm drains.
- A spill kit will be maintained at refueling locations.

If POL is stored on the project site, each POL stored will be listed on the hazardous materials inventory and prevention. Secondary containment will be provided for POL storage for any container with 55 gal or more of capacity. The stormwater controls for the material storage will include provisions that:

- Material is not stored directly on the ground.
- Containers are protected from the weather, including precipitation.
- Storm drains in the vicinity of the material storage are covered.
- All containers are maintained in good condition, with secured lids and proper labeling.
- Spill kits are maintained and located in the construction support vehicles.

## 7.0 Non-Structural Controls

Good housekeeping practices are designed to maintain a clean and orderly work environment. Often, the most effective first step toward preventing pollution of stormwater simply involves using good common sense to improve basic housekeeping methods. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling chemicals and equipment and reduces safety hazards. The following practices will be incorporated into the field activities as part of good housekeeping practices:

- Garbage, waste materials, and construction debris will be regularly picked up and disposed of or secured.

- The site will be maintained in an orderly condition.
- Good housekeeping practices will be reviewed with workers at the beginning of the project site activities.

Preventive maintenance involves the regular inspection and testing of equipment and operational systems. Breakdowns and failures can often be avoided by adjustment, repair, or replacement of equipment. The following practices will be incorporated into the field program as part of preventive maintenance:

- Equipment will be maintained on a regular basis.
- Any leaking equipment will be repaired or replaced.
- Records of all preventive maintenance activities will be maintained.
- Daily visual inspections identify conditions that may give rise to contamination of stormwater run-off. Daily visual inspections will be conducted during storm events when contractor personnel are present onsite.

Visual inspections are an effective way to confirm that chosen measures are in place and working. The following actions will be taken as part of the visual inspection program:

- Equipment will be checked daily to identify leaks.
- Records of these daily inspections will be maintained in daily logs.

## 8.0 Environmental Conditions Report

Upon mobilization to the site, AGVIQ-CH2M HILL will take several photographs to document existing site conditions prior to performing the system installation. These photographs will be maintained in the project documentation for future reference if needed to document any damage that may have occurred to adjacent facilities as a result of AGVIQ-CH2M HILL activities. An Environmental Conditions Report will be prepared and submitted to NAVFAC SE prior to the commencement of field activities.

## 9.0 Regulatory Inspections and Audits

If project personnel are contacted by a regulatory agency for an inspection of the site, AGVIQ-CH2M HILL Project Manager will immediately contact the NTR and the Navy RPM. AGVIQ-CH2M HILL will follow the direction from the Navy RPM and NTR. Project personnel will not grant site access or answer questions from unauthorized personnel. Any outside party requesting access to inspect the site will be referred to the AGVIQ-CH2M HILL Project Manager, who will immediately initiate the appropriate notification to the Navy.

Appendix D  
Quality Control Plan

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# Quality Control Plan

## Enhanced In Situ Biofilter Pilot Study Site 4 - North AVGAS Tank Sludge Disposal Area

Naval Air Station Whiting Field  
Milton, Florida

Revision No. 00

Contract No. N62470-08-D-1006  
Task Order No. JM19

Submitted to:



Department of the Navy  
Naval Facilities Engineering Command  
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Prepared by:



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August 2015

# Quality Control Plan

## Enhanced In Situ Biofilter Pilot Study Site 4 - North AVGAS Tank Sludge Disposal Area

Naval Air Station Whiting Field  
Milton, Florida

Revision No. 00

Contract No. N62470-08-D-1006  
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Submitted to:



Prepared by:



August 2015

Prepared/Approved By:

  
\_\_\_\_\_  
Amy Twitty, Project Manager

August 12, 2015

\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Sam Naik, Deputy Program Manager

August 14, 2015

\_\_\_\_\_  
Date

Client Acceptance:

\_\_\_\_\_  
U.S. Navy Responsible Authority

\_\_\_\_\_  
Date

# Contents

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<b>Acronyms and Abbreviations.....</b>	<b>vii</b>
<b>1.0 Introduction.....</b>	<b>1-1</b>
1.1 Quality Plan Purpose.....	1-1
<b>2.0 Organization and Responsibilities.....</b>	<b>2-1</b>
2.1 Quality Management Roles and Responsibilities.....	2-1
2.1.1 Program Quality Manager - Theresa Rojas.....	2-1
2.1.2 Project QC Manager.....	2-1
2.2 Outside Organizations and Subcontractors.....	2-2
<b>3.0 Construction QC.....</b>	<b>3-1</b>
3.1 Procedures for Performing the Three Phases of Control.....	3-1
3.2 Mobilization and Site Preparation.....	3-1
3.2.1 Preparatory Phase.....	3-1
3.2.2 Initial Phase.....	3-2
3.2.3 Follow-up Phase.....	3-2
3.3 Field Piping and Biofilter Construction.....	3-2
3.3.1 Preparatory Phase.....	3-3
3.3.2 Initial Phase.....	3-3
3.3.3 Follow-up Phase.....	3-3
3.4 System Installation.....	3-4
3.4.1 Preparatory Phase.....	3-4
3.4.2 Initial Phase.....	3-4
3.4.3 Follow-up Phase.....	3-5
3.5 Operation and Maintenance.....	3-5
3.5.1 Preparatory Phase.....	3-5
3.5.2 Initial Phase.....	3-6
3.5.3 Follow-up Phase.....	3-6
3.6 Waste Management.....	3-6
3.6.1 Preparatory Phase.....	3-7
3.6.2 Initial Phase.....	3-7
3.6.3 Follow-up Phase.....	3-7
3.7 Site Restoration.....	3-8
3.7.1 Preparatory Phase.....	3-8
3.7.2 Initial Phase.....	3-8
3.7.3 Follow-up Phase.....	3-8
3.8 Decontamination and Demobilization.....	3-8
3.8.1 Preparatory Phase.....	3-9
3.8.2 Initial Phase.....	3-9
3.8.3 Follow-up Phase.....	3-9
3.9 Pre-Final Inspection.....	3-9
3.10 Final Acceptance Inspection.....	3-10

<b>4.0</b>	<b>Testing Requirements.....</b>	<b>4-1</b>
4.1	Certification of Chemical Laboratories .....	4-1
4.2	Certification of Geotechnical Laboratories .....	4-1
4.3	Test Plan and Log.....	4-1
<b>5.0</b>	<b>Project Meetings .....</b>	<b>5-1</b>
5.1	Pre-construction Meeting.....	5-1
5.2	Coordination and Mutual Understanding Meeting.....	5-2
5.3	QC Meeting.....	5-2
<b>6.0</b>	<b>Reporting, Field Records, and Construction Documentation.....</b>	<b>6-1</b>
<b>7.0</b>	<b>QC Documentation.....</b>	<b>7-1</b>
7.1	Contractor Production Report.....	7-1
7.2	Contractor Quality Control Report .....	7-2
7.3	Project Files .....	7-3
7.4	Field Documentation Operating Procedures .....	7-3
7.5	Field Logbook.....	7-3
<b>8.0</b>	<b>Construction QC Submittals .....</b>	<b>8-1</b>
8.1	Submittal Review and Control.....	8-1
<b>9.0</b>	<b>Change Control .....</b>	<b>9-1</b>
9.1	Construction Changes .....	9-1
<b>10.0</b>	<b>Noncompliance and Corrective Actions.....</b>	<b>10-1</b>
10.1	Corrective Measure Plan.....	10-1

## Tables

3-1	QC Procedures for Mobilization and Site Preparation
3-2	QC Procedures for Field Piping and Biofilter Construction
3-3	QC Procedures for System Installation
3-4	QC Procedures for Operation and Maintenance
3-5	QC Procedures for Waste Management
3-6	QC Procedures for Site Restoration
3-7	QC Procedures for Decontamination and Demobilization
4-1	Testing Requirements
6-1	Reporting and Field Documentation Required

## Attachments

A	Project QC Forms
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# Acronyms and Abbreviations

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AGVIQ-CH2M HILL	AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III
AHA	activity hazard analysis
APP	Accident Prevention Plan
AVGAS	aviation gasoline
CO	Contracting Officer
DFOW	definable feature of work
H&S	health and safety
NAS	Naval Air Station
IR CDQM	<i>Installation Restoration Program Chemical Data Quality Manual</i>
NAVFAC SE	Naval Facilities Engineering Command Southeast
NFESC	Naval Facilities Engineering Service Center
QA	quality assurance
QC	quality control
QCP	Quality Control Plan
RFI	Request for Information
SHSO	Site Health and Safety Officer
SSHP	Site Safety and Health Plan
SVE	soil vapor extraction
TO	Task Order
WMP	Waste Management Plan

# 1.0 Introduction

---

AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III (AGVIQ-CH2M HILL) was contracted by U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE) to perform activities for an enhanced in situ biofilter pilot study at Site 4 (Operational Unit 4), the North Aviation Gasoline (AVGAS) Tank Sludge Disposal Area, Naval Air Station (NAS) Whiting Field, Milton, Florida. Upon completion of a previous pilot study at the site (bioventing effort), additional pilot testing that will utilize an enhanced in situ biofilter was requested by the Navy. Work has been and will be completed under Contract No. N624670-08-D-1006, Task Order (TO) No. JM19.

## 1.1 Quality Plan Purpose

The *Enhanced In Situ Biofilter Pilot Study Work Plan – Site 4 North AVGAS Tank Sludge Disposal Area Work Plan* (Work Plan) presents equipment specifications and field procedures for performing the enhanced in situ biofilter pilot study at Site 4. The purpose of this Quality Control Plan (QCP) is to outline the procedures that will be employed while installing, operating, and optimizing treatment system performance during the pilot study. Vapor samples will be collected and treatment system parameters will be conducted during system operation and monitoring; as well as necessary maintenance performed during the study.

# 2.0 Organization and Responsibilities

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The organization of the overall project team that will deliver this task order are outlined within Section 3.0 of the Work Plan document. The focus of this section is to summarize the key roles of construction quality assurance (QA) and quality control (QC) personnel.

## 2.1 Quality Management Roles and Responsibilities

The roles and responsibilities for individuals responsible for managing and executing the TO are shown in Table 3-4 of the Work Plan. The TO organization chart is provided in Figure 3-4 of the Work Plan.

### 2.1.1 Program Quality Manager – Theresa Rojas

The Program Quality Manager, Theresa Rojas, is responsible for developing, maintaining, and ensuring implementation of the quality program on this project. This responsibility includes oversight of activities performed under the guidance of this QCP, conducting periodic reviews of the processes being implemented, and implementing continuous improvement evaluations of the quality program.

### 2.1.2 Project QC Manager

The Project QC Manager for the TO is yet to be determined. The letter appointing the Project QC Manager will be provided at a later date.

The Project QC Manager is responsible for the execution of the TOs construction quality control system and communicates the onsite QA program policies, objectives, and procedures to the project team during project meetings and informal discussions. All documentation related to the control of the quality of the project, including analytical test results, inspections, material test results, and audits, will be reviewed or prepared by the Project QC Manager. The Project QC Manager's duties include the following:

- Three phases of control inspections
- Control testing
- Document control
- Review of submittals
- Completion inspection
- Records management and archive
- Conduct of audits and surveillance

The Project QC Manager will also coordinate with and assist the Navy representatives in the performance of QA audits and inspections.

## 2.2 Outside Organizations and Subcontractors

AGVIQ-CH2M HILL assumes overall responsibility for ensuring conformance of vendor provided materials and procured services to quality requirements. However, it is the responsibility of the service personnel to plan, manage, and accomplish his/her subcontractor services in accordance with written requirements of service agreements, state, and local laws and regulations.

Services and materials planned to be subcontracted or procured for the combined soil vapor extraction (SVE) and in situ biofilter treatment system installation include:

- Underground utility locator and marking service
- Chemical Laboratory (offsite testing of samples)
- Biofilter Media Vendor
- Waste Transportation and Disposal Services

## 3.0 Construction QC

---

The construction details and requirements applicable to the work activities are outlined in Project Execution Plan of the Work Plan. The quality administrators his QCP are outlined in the subsections that follow. The Project QC Manager and the Site Engineer will verify conformance with the field requirements. The Project QC Manager will perform inspections of the materials and the overall work activities. Inspections are performed to ensure safe, efficient, quality work is performed, while meeting the requirements of the Work Plan, including supporting plans, and pilot study objectives.

The project tasks for this TO are grouped into definable features of work (DFOWs), which are work activities that are significant enough to warrant separate plans and specifications. The DFOWs for this project are:

- Mobilization and Site Preparation
- Field Piping and Biofilter Construction
- System Installation
- Operation and Maintenance
- Waste Management
- Decontamination and Demobilization

### 3.1 Procedures for Performing the Three Phases of Control

The DFOWs will be inspected in accordance with the three phases of control – preparatory, initial, and follow-up. An overview of the inspection provisions is outlined in the subsections that follow.

### 3.2 Mobilization and Site Preparation

Prior to mobilization to the field, all plans will be approved and thus finalized; as well as the necessary work permits required to comply with the administrative requirements of NAS Whiting Field, and local environmental laws and regulation.

As part of the mobilization activity, a pre-construction meeting will be held to review the preparedness to begin the project, the overall project scope and schedule, communications, and reporting.

#### 3.2.1 Preparatory Phase

The preparatory phase will include a review of the Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) and relevant Activity Hazard Analyses (AHAs), the construction sequence, communications matrix, project schedule, and confirmation that appropriate materials and equipment are onsite or are in the process of mobilizing to the site. The preparedness check will verify that site preparation provisions such as utility clearances, demarcating the work zones, and staging of equipment and material, are in place to begin the work activities. Equipment and materials will be verified functional and in

good working condition prior to starting the project. Additionally utility clearance will be conducted in areas where subsurface work (in situ biofilter trench construction, piping installations, etc.) is anticipated.

### 3.2.2 Initial Phase

Inspections will be made as necessary to ensure construction limits are defined, utilities marked, and material staged in the designated areas. Additionally, equipment will be inspected for operability and proper function. Deficient equipment will not be permitted to operate.

### 3.2.3 Follow-up Phase

The Project QC Manager will provide continuous oversight of the site preparation activities to verify that the work is completed in accordance with the requirements provided in the Work Plan and NAS Whiting Field rules. Deficiencies will be noted and corrected.

Table 3-1 lists the QC procedures that will be implemented during mobilization and site preparation activities.

TABLE 3-1  
QC Procedures for Mobilization and Site Preparation

Task	Procedures/Construction Details
Pre-construction Meeting	<ul style="list-style-type: none"> <li>• Conduct a pre-construction meeting and prepare meeting minutes</li> <li>• Verify dig permit and utility clearance from the facility and utility locates, respectively</li> <li>• Verify designated locations of equipment layout, material and waste staging areas</li> <li>• Review site security measures</li> <li>• Discuss construction schedule</li> <li>• Ensure SDSs are onsite</li> </ul>
Site Preparation	<ul style="list-style-type: none"> <li>• Verify site layout plan</li> <li>• Confirm that field equipment is properly setup and calibrated and in operational condition</li> <li>• Confirm that the materials and equipment are stored properly in accordance with the Work Plan</li> <li>• Ensure the erosion controls are installed properly</li> <li>• Confirm utility clearance is adequately documented</li> <li>• Identify all associated utilities; and coordinate system electrical connection</li> <li>• Update site maps with any known utilities</li> </ul>
Pre-construction Submittals	<ul style="list-style-type: none"> <li>• Review Submittal Register</li> <li>• Accident Prevention Plan with AHAs</li> <li>• Personnel qualification and certifications</li> <li>• Verify Environmental Conditions Report – for documenting existing site conditions</li> </ul>

## 3.3 Field Piping and Biofilter Construction

The primary focus of this activity is the initial layout of subsurface piping routes and the approximate locations of the three in situ biofilter trenches, receiving and blending the filter media, and placement of the biofilter materials into the excavated trenches. Thoroughly

blending the biofilter media is a critical stage in biofilter construction thus measurement and control of the blending operation is integral to the performance of the system.

### 3.3.1 Preparatory Phase

The preparatory phase will include a review of the relevant AHAs, review of submittal status (including Submittal Register) for the critical in situ biofilter items, coordination of media and treatment system materials delivery, discussion of schedule to include sequence of piping placement, trench excavation, and in situ biofilter construction. Additionally, the status and layout major treatment system components will be discussed. The status of materials, SVE system equipment and components, baseline sampling, coordination of electrical power connections, and administrative submittals will also be reviewed.

### 3.3.2 Initial Phase

Piping installation, media mixing, and control of the in situ trench excavation and materials management will be inspected to ensure project Work Plan requirements are being achieved. Documentation for all activities will be reviewed closely for accuracy and completeness. The AGVIQ-CH2M HILL Project QC manager will complete the initial inspection to verify that the materials are being managed and adequately tracked to ensure the appropriate construction quality measures are being implemented. Any deficiencies will be documented and corrected as necessary.

### 3.3.3 Follow-up Phase

The Project QC Manager will be responsible for the daily inspection of all site activities and review and/or preparation of project documentation. Daily surveillance will verify that the controls are compliant with project requirements. Oversight activities will include verification that the work is being completed according to the technical specifications and the in situ biofilter details provided on the construction drawings. Attention will be placed on in situ biofilter trenches excavation dimensions, trench materials preparation, and backfilling.

Table 3-2 lists the QC procedures that will be implemented during field piping and biofilter construction.

TABLE 3-2  
QC Procedures for Field Piping and Biofilter Construction

<b>Task</b>	<b>Inspection/Construction Control</b>
Piping	<ul style="list-style-type: none"> <li>• Inspect materials and equipment upon delivery for conformance with submittal requirements</li> <li>• Observe piping connections and monitor construction measures to ensure piping integrity not compromised</li> <li>• Measure and record depth of pipe bedding</li> <li>• Inspect piping, connections, and ancillary equipment/fittings for conformity with submittals</li> <li>• Confirm that the appropriate HDPE liner is used to cover the trenches</li> <li>• Confirm that the appropriate samplers and monitoring points are installed</li> <li>• Update site maps to illustrate and document routing/depths of piping</li> <li>• Verify that recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete</li> </ul>

TABLE 3-2  
QC Procedures for Field Piping and Biofilter Construction

Task	Inspection/Construction Control
Biofilter Construction	<ul style="list-style-type: none"> <li>• Inspect materials and equipment upon delivery for conformance with submittal requirements</li> <li>• Confirm that oversight is provided by a Florida registered geologist or engineer</li> <li>• Confirm that proper decontamination procedures are used</li> <li>• Confirm that the trench excavations are the correct dimensions</li> <li>• Observe media blending activities; review control measures to assure compliance with blend design</li> <li>• Measure and record quantities of nutrient solutions added to TRENCH 1 (only) media during mixing operation</li> <li>• Monitor trench backfilling operation to assure compliance with trench design</li> <li>• Assess piping configuration and construction technique; document construction details</li> <li>• Inspect vapor distribution vault orientation and proper installation techniques</li> <li>• Examine the placement and configuration of trench liner; document results of observations</li> <li>• Confirm that the appropriate samplers and monitoring points are installed</li> <li>• Sketch configuration of soaker piping; perform function test to ensure proper function</li> </ul>

## 3.4 System Installation

Connecting of the SVE system (skid mounted blower) and ancillary components (moisture knock out drum, water tank and supply piping, effluent sampling port, etc.) to existing well 04-MC-10 and the in situ biofilter will be completed in accordance with the installation guidelines of the Work Plan. The approximate locations of system components will comply with the system layout demarcated during mobilization and site preparation. NAS Whiting Field will provide the electrical distribution to power the treatment system. System startup and testing will be performed by AGVIQ-CH2M HILL staff. Collection of baseline samples will be performed prior to system startup.

### 3.4.1 Preparatory Phase

The preparatory phase meeting will include review and discussions of submittals, baseline sampling, and the means and methods for assembling system components. Testing requirements will include reviews of meter calibration, piping testing, and system interlocks. Function testing of the system will occur during system operation and maintenance. As with all work activities, the associated AHAs, the site-specific H&S Plan, and submittal status will be reviewed.

### 3.4.2 Initial Phase

There will be overlap of a portion of the related initial phase inspection completed during the installation of the field piping. The majority of the testing will be system function testing. The initial phase inspection of the SVE skid will be initiated upon receiving the system and again once energized. Logbooks and field recording forms will be reviewed for completeness. Any deficiencies noted will be documented and corrected as necessary.

### 3.4.3 Follow-up Phase

The Project QC Manager will be responsible for monitoring system installation and documenting function testing of the system. Surveillance will verify that the work is being completed in accordance with the Work Plan requirements.

Table 3-3 lists the QC procedures that will be implemented during system installation.

TABLE 3-3  
QC Procedures for System Installation

Task	Inspection/Construction Control
System Installation	<ul style="list-style-type: none"> <li>• Manage submittal process and obtain/review all submittals</li> <li>• Document testing of power distribution to system</li> <li>• Inspect material and equipment deliveries and evaluate for conformity with submittal requirements</li> <li>• Label vapor distribution lines/valves</li> <li>• Inspect sampling activities and review chain of custody for laboratory samples</li> <li>• Monitor horizontal and vertical control/measurements of knock out tank system plumbing</li> <li>• Document flow control/metering device calibrations</li> <li>• Ensure field recording forms complete and accurate</li> <li>• Review air monitoring data and instrument calibration records</li> <li>• Observe function testing of system interlocks and document</li> <li>• Verify effluent vapor discharge within acceptable action limits</li> </ul>

## 3.5 Operation and Maintenance

The operation and maintenance includes recording system operating parameters, collection of process and compliance samples, and performing the necessary system operating adjustments throughout the pilot study.

Laboratory samples will be collected in accordance with the monitoring plan requirements. These environmental samples will be collected in accordance with the Sampling and Analysis Plan (Work Plan Section 4). Process and field samples will be collected and tested onsite by individuals qualified by training and/or work experience. The Project QC manager shall oversee, and in many cases, participate in sampling events to assure samples are representative and collected in accordance with sampling protocols. Other controls will include, but are not limited to, maintaining a chain of custody; proper handling, packing, and shipping; sampling performed by qualified persons; and the use of qualified laboratories.

### 3.5.1 Preparatory Phase

The preparatory phase for this DFOW may be held jointly with system installation as the installation and startup processes are closely related. Meeting discussions will include the logistics and communications associated with treatment operations and initiation of effluent discharge. Submittals for the baseline laboratory and field measurements will be evaluated; additionally, field parameters and balancing the system variables will be discussed and eventually reported in accordance with Work Plan reporting schedules. Coordination of samples to be analyzed will be performed by the AGVIQ-CH2M HILL Project Chemist as necessary over the course of the monitoring and operating period. The status of the offsite

environmental laboratory and preparedness for onsite sampling will be discussed. The H&S plan and AHAs will be reviewed and updated if necessary.

### 3.5.2 Initial Phase

Inspections will be conducted to ensure no fugitive emissions from effluent discharge or the in situ biofilter. Results of observations and operating data will be recorded.

### 3.5.3 Follow-up Phase

The AGVIQ-CH2M HILL Project QC manager will observe operation and maintenance activities and review recording forms to assure accurate and complete. The progress of operations will be tracked and monitored.

Table 3-4 lists the QC procedures that will be implemented during operation and maintenance.

TABLE 3-4  
QC Procedures for Operation and Maintenance

<b>Task</b>	<b>Inspection/Construction Control</b>
Field Sampling	<ul style="list-style-type: none"> <li>• Review sampling personnel qualifications for conformity with Navy IRCDQM</li> <li>• Document pertinent sampling location information</li> <li>• Acquire copy of onsite/offsite laboratory certification</li> <li>• Verify appropriate facilities and testing equipment are available and comply with testing standards</li> <li>• Verify the field instruments are calibrated in accordance with manufacturers' recommendations</li> <li>• Verify recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete</li> <li>• Inspect sample ports/points for integrity</li> <li>• Ensure SDSs are onsite</li> </ul>
Operation and Maintenance	<ul style="list-style-type: none"> <li>• Perform system walk-around inspection during site visits and document results</li> <li>• Measure and record system parameters</li> <li>• Coordinate transfer of condensate as necessary; update waste tracking log</li> <li>• Coordinate with Project Chemist when samples for analysis by offsite laboratory are collected/shipped</li> <li>• Implement monitoring and maintenance plan requirements</li> </ul>

## 3.6 Waste Management

Wastes generated during the installation and operation of the in situ biofilter system pilot study will include condensate, decontamination water, construction debris, and sampling-related waste. These wastes will be managed in accordance with the requirements set forth in the Waste Management Plan (WMP) (Work Plan, Appendix B). Other controls will include, but are not limited to, verification of waste volumes and weights, documenting all waste managed on the waste tracking log, and verification of transporter license (if used) and credentials.

### 3.6.1 Preparatory Phase

The preparatory phase for management waste streams includes a review of the WMP, disposal, recycling or treatment facility qualifications, and transportation schedule for hauling material offsite; as well as confirmation that the appropriate equipment and materials, such as waste manifests, are available to commence the work activity. Review and acceptance of the waste disposal package by the AGVIQ-CH2M HILL environmental manager is required prior to submitting the package to the Navy for approval. Prior to any work, the relevant AHAs will be reviewed and discussed. All temporary storage containers will be inspected prior to acceptance onto the project and labeled.

### 3.6.2 Initial Phase

The waste transport vehicles will be inspected prior to accepting onsite. Drums used for transporting waste solid will be inspected for foreign materials prior to filling. Information provided on the waste manifest must be verified as complete and accurate, including but not limited to, generator name, address and signature, date, type of material being hauled, designated recycling or treatment facility, and volume and/or weight of material. Any discrepancies on waste manifest documents will be corrected.

### 3.6.3 Follow-up Phase

The AGVIQ-CH2M HILL environmental manager for the project will verify that the designated disposal, treatment, or recycling facility has accepted and treated the waste material at the facility and has sent the required completed manifest to the generator or the generator's technical representative. Receipt of the certificate of recycling or disposal from the designated facility must be verified, as well as that the invoice is complete and accurate. A field logbook and an electronic log of all transportation and disposal shipments will be maintained. Drums will be routinely inspected for integrity and inventoried. Waste storage areas will be visually inspected on a daily basis for releases or signs of corrosion, deterioration, or other conditions that could result in a release. These results of all inspections will be recorded.

Table 3-5 lists the QC procedures that will be implemented during waste management activities.

TABLE 3-5  
QC Procedures for Waste Management

Task	Procedures/Construction Details
Waste Management	<ul style="list-style-type: none"> <li>• Verify designated locations of equipment layout, material and waste staging, and decontamination</li> <li>• Update waste tracking log and label waste containers</li> <li>• Inspect segregated wastes, and label containers with content</li> <li>• Inspect waste containers for cleanliness, acceptable materials of construction, and adequate storage volume</li> </ul>
Transportation and Disposal	<ul style="list-style-type: none"> <li>• Verify waste profile completion (obtain Navy signature)</li> <li>• Verify transporter and disposal facility certificates of disposal</li> <li>• Verify waste storage area inspection</li> </ul>

## 3.7 Site Restoration

Disturbed areas will be repaired or graded to return to conditions that existed prior to the initiation of work. Revegetation will be established by reseeded and mulching. All debris resulting from site cleanup activities will be managed as described in the WMP (Work Plan, Appendix B).

### 3.7.1 Preparatory Phase

The project team will review the AHAs associated with the drilling and site restoration activities, inspect the equipment to ensure it is in good working condition and suitable for the work, confirm that it has been adequately decontaminated prior to initiating these activities, review the plan for performing the work, and discuss outstanding items that may affect the start of excavation

### 3.7.2 Initial Phase

The project team will review the AHAs associated with the drilling and site restoration activities, inspect the equipment to ensure it is in good working condition and suitable for the work, confirm that it has been adequately decontaminated prior to initiating these activities, review the plan for performing the work, and discuss outstanding items that may affect the start of excavation

### 3.7.3 Follow-up Phase

The project team will review the AHAs associated with the drilling and site restoration activities, inspect the equipment to ensure it is in good working condition and suitable for the work, confirm that it has been adequately decontaminated prior to initiating these activities, review the plan for performing the work, and discuss outstanding items that may affect the start of excavation

Table 3-6 lists the QC procedures that will be implemented during site restoration.

TABLE 3-6  
QC Procedures for Site Restoration

<b>Task</b>	<b>Inspection/Construction Control</b>
Site Restoration	<ul style="list-style-type: none"><li>• Verify disturbed soil has been replaced</li><li>• Inspect erosion control measures</li><li>• Inspect restored areas and project site for cleanliness</li><li>• Document and correct deficiencies</li></ul>

## 3.8 Decontamination and Demobilization

Equipment and personnel will be demobilized from the site following the completion of the work activities identified in the Work Plan. The Project QC Manager will verify that the project objectives associated with construction have been met. A final inspection will be conducted to verify completion of all project activities. Findings, should any be identified, will be tracked, resolved, and documented during a final site walk-through inspection that will include facility operations personnel and other stakeholders.

### 3.8.1 Preparatory Phase

The Preparatory Phase will include a review of decontamination procedures, the site-specific APP (Work Plan Appendix A), and relevant AHAs.

### 3.8.2 Initial Phase

The Project QC Manager will perform inspections to confirm that the objectives of the decontamination activities have been met and that the rework items, if any, have been completed to the satisfaction of AGVIQ-CH2M HILL and the Navy.

### 3.8.3 Follow-up Phase

The Project QC Manager will provide continuous oversight of demobilization to verify that the work is completed in accordance with the requirements provided in plan documents. Deficiencies will be noted and corrected.

Table 3-7 lists the QC procedures that will be implemented during decontamination and demobilization.

TABLE 3-7  
QC Procedures for Decontamination and Demobilization

<b>Task</b>	<b>Inspection/Construction Control</b>
Demobilization	<ul style="list-style-type: none"><li>• Inspect Work areas to ensure all temporary facilities, equipment, and materials are safely removed from the site</li><li>• Inspect Work areas provided to ensure proper housekeeping and cleaning</li><li>• Verify pre-final inspection when work is substantially complete</li><li>• Review Punch lists on outstanding items</li><li>• Verify Final Inspections--all task order areas</li><li>• Document orderly site demobilization</li><li>• Collate site records &amp; documents</li><li>• Ensure records and documentation transfer to home office</li><li>• Perform Purchase order closeouts</li><li>• Review Final reports &amp; deliverables</li></ul>

## 3.9 Pre-Final Inspection

The Navy may perform a pre-final inspection to verify that the facility or work area is complete and ready to be occupied. A government “pre-final punch list” may be developed as a result of this inspection. Each deficiency noted in the punch list will reference the applicable specification paragraph, or drawing number that the deficiency stems from. The Project QC Manager will ensure that items on this list are corrected before notifying the Navy that a final inspection with the stakeholders can be scheduled. Items noted on the “pre-final” inspection will be corrected in a timely manner and will be accomplished within the time slated for completion of the entire work or a particular increment thereof if the project is divided into increments by separate completion dates.

## 3.10 Final Acceptance Inspection

The Project QC Manager, Site Engineer, and Navy representatives will be in attendance at the final acceptance inspection. Other government personnel and stakeholders may be in attendance. A final acceptance inspection will be considered closed when the work has been accepted by the Navy Technical Representative or designated representative.

# 4.0 Testing Requirements

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Laboratories performing testing or analysis of materials and environmental samples, or craftsman performing independent testing will be certified or qualified to perform the respective testing. This section summarizes the onsite field testing planned for the project. Details of equipment, materials, products, and construction activities are outlined in the final design documents. Samples of media requiring definitive chemical analyses will be performed by an approved offsite laboratory.

Individuals performing sampling shall provide evidence of meeting the experience and training requirements in the Navy's *Installation Restoration Program Chemical Data Quality Manual* (IR CDQM) (FESC SP-2056-ENV, Naval Facilities Engineering Service Center [NFESC], 1999).

## 4.1 Certification of Chemical Laboratories

Environmental testing laboratories that will be used for this TO will function as a subcontractor or a lower-tier subcontractor to AGVIQ-CH2M HILL. The analytical laboratory, yet to be contracted, will be NFESC-approved, will maintain National Environmental Laboratory Accreditation, accredited by the Department of Defense Environmental Laboratory Accreditation Program, and will be certified by the State of Florida for all sample analyses.

## 4.2 Certification of Geotechnical Laboratories

No geotechnical testing is planned for this TO. In the event geotechnical testing becomes necessary, testing laboratory(ies) used will be certified by the National Institute of Standards and Technology, the National Voluntary Laboratory Accreditation Program, the American Association of State Highway and Transportation Officials, or the American Association for Laboratory Accreditation; or they may be actively participating in an another accreditation program that may be evaluated for acceptance.

## 4.3 Test Plan and Log

The field testing requirements are shown in Table 4-1. The Testing Plan and Log (provided in Attachment A) will be used to record the results of testing. Detailed records of testing will be included in the CQCR as testing is performed and will be summarized in the Monthly Summary Report of Field Tests.

TABLE 4-1  
Testing Requirements

<b>Test/Inspection</b>	<b>Requirement/Reference</b>	<b>Frequency</b>
Supply Voltage	230 Volts, 10 amperes	Once
Interlocks	Function test	Once or as needed during startup
Instrument Calibration: air monitoring, water quality, flow and density measuring	Per manufacturer's recommendations	Prior to installation, then after repairs or replacement.
Media thickness	Per: bedding sand, treatment media, soil cover	Following layer placement

# 5.0 Project Meetings

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## 5.1 Pre-construction Meeting

The project manager will schedule and administer a pre-construction meeting at the site after Notice to Proceed and before the start of construction at the site. During the conference, ground rules and understandings will be established with the Navy, NAS Whiting Field representatives and its stakeholders, and AGVIQ-CH2M HILL. The purpose of this meeting is to ensure that all parties involved in the project understand and agree on the project goals and objectives, schedule, submittal requirements, documentation requirements, change management processes and procedures, construction means and methods, reporting and communication requirements, H&S requirements and protocols, etc.

The meeting agenda will include the following:

- Designation of responsible personnel
- Lines of authority and communication
- H&S requirements and procedures
- Use of the site for storage, vehicle parking, access routes, and other site requirements
- NSB security and other requirements
- Coordination with other contractors and owner
- Temporary facilities and controls provided by AGVIQ-CH2M HILL
- Field offices
- Survey, containment facility, and layout
- Security and housekeeping procedures
- Procedures for processing field decisions, submittals, substitutions, applications for payments, proposal requests, field orders, work change directives, change orders, and closeout procedures
- Progress schedules
- Procedures for testing and inspection
- Procedures for maintaining record documents

Minutes of the meeting will be prepared by the AGVIQ-CH2M HILL representative and distributed to the participants and those affected by decisions made. At a minimum, the AGVIQ-CH2M HILL project team and major subcontractors will be in attendance at this meeting.

## 5.2 Coordination and Mutual Understanding Meeting

Before the start of any onsite activities, the project manager and Project QC Manager shall meet with the Navy's CO or designated representative to review the QCP and the QC Program required by the contract. The purpose of the meeting will be to confirm that the Project QC Manager and Navy's CO or designated representative clearly understand and agree on:

- Specific QC points of concern on the features of work
- Forms to be used on the project and the correct protocol for use of each form
- Administration of both onsite and offsite work
- Duties and responsibilities of all AGVIQ-CH2M HILL personnel on the site

The meeting shall be attended by the project, Project QC Manager, Site Engineer, and SHSO. The meeting can also be combined with the pre-construction conference. Minutes of the meeting shall be prepared by the Project QC Manager and signed by both the Navy's CO or designated representative and AGVIQ-CH2M HILL's representative.

## 5.3 QC Meeting

After the start of site work, the Project QC Manager shall conduct QC meetings at a frequency established as necessary by the pace of the work, or as required by the Navy's CO or designated representative. Typically, meetings are expected to occur at least weekly or more frequently, depending on the project needs. Conducting the meetings and preparing the meeting minutes are responsibilities of the Project QC Manager. Annotation of conducting the meeting will be made in the daily contractor QC report. The meeting shall be attended by the Site Engineer, SHSO, and the foreman responsible for the upcoming work. The Navy's CO or designated representative shall be invited to all meetings. To optimize time, these meetings should be held in conjunction with other meetings (for example progress meetings, weekly safety meetings) where possible. As a minimum, the following shall be accomplished at each meeting:

- Review of previous meeting minutes
- Review of the project schedule
  - Work or testing accomplished since the last meeting
  - Rework items identified since the last meeting
- Rework items completed since the last meeting
- Submittal status
  - Submittals reviewed since the last meeting
  - Submittals expected within the next 2-week window
- Review of the work scheduled over the next 2-week window
  - Establish completion targets for any outstanding rework
  - Identify and schedule any DFOWs requiring preparatory phase activities
  - Identify and schedule any DFOWs requiring initial phase activities
  - Identify and schedule any DFOWs requiring follow-up phase activities

- Identify any testing required in support of or confirming remedial activities
- Review status of any offsite activities
- Identify any special documentation requirements for either production or QC
- Address and resolve any production or QC problems
- Identify any activities or items that may require revising this QCP and annotate any recommendations
- Identify any production or QC procedures that may be less effective than anticipated and may require revising the project delivery or Contingency Plan and annotate any recommendations
- Identify any safety concerns relative to any work activity

# 6.0 Reporting, Field Records, and Construction Documentation

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Implementation of this QCP is documented and reported to the Navy CO or designated representative using a series of reports and deliverables. These deliverables, the parties responsible for preparing them, and their frequency and content are listed in Table 6-1. Examples of these forms and reports are included in Attachment A.

TABLE 6-1  
Reporting and Field Documentation Required

<b>Report or Documentation Requirement</b>	<b>Completed By</b>	<b>Delivered To</b>	<b>Frequency</b>	<b>Report Description</b>
Contractor Production Report	Site Engineer	Project QC Manager	Daily, for each TO – original and one copy due by 10 am next working day after each day that work is performed	Documents daily construction activity on each site.
Construction Quality Control Report	Project QC Manager	Navy CO	Daily, for the preceding business day - original and one copy due by 10 am next working day after each day that work is performed	Documents the daily qc activity for each to. Includes the contractor production reports.
Testing Plan and Log	Project QC Manager	Navy CO	Monthly – due by end of each month	Defines and records results of all onsite testing, for each to be maintained at time of testing, or when laboratory results are received..
Monthly Summary of Field Tests	Project QC Manager	Navy CO	Monthly, attached to the last CQCR submitted for each reporting period – original and one copy due at the end of each month	Summarizes all testing activity conducted for the reporting period.
QC Meeting Minutes	Project QC Manager	Navy CO	As attachment to appropriate CQCR – due within 2 calendar days of the meeting	Minutes of any to QC meeting held.

TABLE 6-1  
Reporting and Field Documentation Required

<b>Report or Documentation Requirement</b>	<b>Completed By</b>	<b>Delivered To</b>	<b>Frequency</b>	<b>Report Description</b>
Rework Items List	Project QC Manager	Navy CO	Monthly, attached to the last CQCR submitted for each reporting period – one copy by last working day of the month	Documents re-work items not corrected on same day as discovery. Includes items identified by both CH2M HILL and Navy CO or designated representative.
Submittal Register	Project QC Manager and Site Engineer	Navy CO	Maintained through life of TO	A part of each TO's Construction Quality Plan; may also be provided by Navy CO for deliverables. Specific to the construction activity for that Task Order.
As-built (or red-lined) Records	Project QC Manager and Site Engineer	Navy CO	Maintained in field through life of each to certify complete and accurate by Project QC Manager upon completion. Included in construction completion report	Requirements specified in each TO's Construction Quality Plan; to be maintained at job site and inspected by QC personnel to ensure daily upkeep. Certificate of accuracy required from Project QC Manager, to Navy CO or COR.
Photographic Record	Site Engineer	Navy CO	Maintained in field through life of TO	Photographic record showing construction progress, special situations.
Transportation and Disposal Log	Project QC Manager	Transportation and Disposal Coordinator	Monthly and maintained in field through life of TO	Tracks waste on the project from generation to final disposition.

# 7.0 QC Documentation

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## 7.1 Contractor Production Report

Contractor Production Reports (CPRs) are required for each day that work is performed and will be attached to the CQCR prepared for the same day. The CPR is the daily record of operations on the job site and must be kept current. These reports are the official record of work performance and compliance with project plans, drawings, and specifications. It is therefore critical that the reports are correct and timely.

The CPRs will account for each calendar day throughout the life of the contract. The reporting of work will be identified by terminology consistent with the construction schedule. CPRs will be prepared, signed, and dated by the Site Supervisor (or responsible person) and will contain the following information:

- a) Date of report, report number, name of contractor, contract number, title, location of contract, and Site Supervisor (or responsible person) present.
- b) Weather conditions in the morning and in the afternoon, including maximum and minimum temperatures.
- c) A list of contractor and subcontractor personnel on the work site, their trades, employer, work location, description of work performed, and hours worked.
- d) A list of job safety actions taken and safety inspections conducted. Indicate that safety requirements have been met, including the results of the following:
  - 1) Was a job safety meeting held? (if YES, attach a copy of the meeting minutes)
  - 2) Were there any lost time accidents? (if YES, attach a copy of the completed Occupational Safety and Health Administration report.)
  - 3) Was trenching, scaffold, high-voltage electrical, or high work done? (If YES, attach a statement or checklist showing inspection performed.)
  - 4) Was hazardous material or waste released into the environment? (If YES, attach description of incident and proposed action.)
- e) A list of equipment and material received each day that is incorporated into the job.
- f) A list of construction and plant equipment on the work site during the number of hours used, idle, and down for repair.
- g) A "Remarks" section containing pertinent information such as directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instruction given and corrective actions taken, delays encountered, and a record of visitors to the work site.

The CPR form provided in Attachment A will be used on this project.

## 7.2 Contractor Quality Control Report

The CQCR documents the quality activities on the project. CQCRs are required for each day that work is performed and for every 7 consecutive calendar days of no work, submitted on the last day of that no-work period. The CQCR is the daily records of QC actions performed on the job site and must be kept current. These reports are the official record of work performance and compliance with project plans, drawings, and specifications. It is therefore critical that the reports are correct and timely.

Each calendar day throughout the life of the contract is accounted for in the CQCR. The reporting of work will be identified by terminology consistent with the construction schedule. CQCRs are prepared, signed, and dated by the Project QC Manager and will contain the following information:

1. Identify the control phase and DFOW.
2. Results of the preparatory phase meetings held, including the location of the DFOW and a list of personnel present at the meeting. Verify in the report that for this DFOW, the drawings and specifications have been reviewed, submittals have been approved, materials comply with approved submittals, materials are stored properly, preliminary work was done correctly, the testing plan has been reviewed, and work methods and schedule have been discussed.
3. Results of the initial phase meetings held, including the location of the DFOW and a list of personnel present at the meeting. Verify in the report that for this DFOW the preliminary work was done correctly, samples have been prepared and approved, the workmanship is satisfactory, test results are acceptable, work is in compliance with the contract, and the required testing has been performed. Include a list of personnel who performed the tests.
4. Results of the follow-up phase inspections held, including the location of the DFOW. Verify in the report for this DFOW that the work complies with the contract as approved in the initial phase and that required testing has been performed. Include a list of personnel who performed the tests.
5. Results of the three phases of control for offsite work, if applicable, including actions taken.
6. List rework items identified, but not corrected by close of business.
7. As rework items are corrected, provide a revised rework items list along with the corrective action taken. (Note: All rework will be non-fee bearing).
8. A "Remarks" section containing pertinent information such as directions received, QC problem areas, deviations from the QCP, construction deficiencies encountered, QC meetings held, acknowledgment that as-build drawings have been updated, corrective direction given by the Project QC Manager, and corrective action taken.
9. CQCR certification

The CQCR form and Preparatory Phase Report included in Attachment A will be used on this project.

## 7.3 Project Files

Documentation generated by the QC system must be maintained in an orderly fashion. It is suggested that the Project QC Manager maintains a series of 3-ring binders for ready reference. These should be arranged by category and tabbed to include the following items:

- CPR
- CQCR
- H&S Reports
- Rework items lists
- Testing plan and log
- Monthly summary of field tests
- Submittal Register
- Contract modifications and Requests for Information (RFIs) arranged in numerical order
- Correspondence
- Non-compliance notices and corrective actions
- Photos and photo logs
- Waste disposal records

## 7.4 Field Documentation Operating Procedures

The objective of the field documentation operating procedures is to ensure that appropriate project information is documented in logbooks during construction. This documentation is important for communicating activities with other project team members and the Navy personnel.

QC observations, inspections, and records of general QC activities on a regular basis are as follows:

- Record daily progress and associated QA and QC sampling
- Record construction operations, sequence, staging, and so forth
- Maintain waste disposal records
- Describe deviations from expected conditions, unexpected problems, and their resolution

## 7.5 Field Logbook

The Project QC Manager will maintain a record of daily QC activities during construction in a field logbook that will be available upon request for review. Information recorded in the CPR and CQCR will be supplemented with information contained in the logbook, but the intent is not to repeat information. As an operating procedure for logbook entries, the following items will be recorded, at a minimum:

- Date, project name, and location

- Daily start time
- Summary of weather conditions
- General description of work activities, size of work crew, and the equipment and personnel onsite
- Duration of lunch break
- Start time and duration of downtime resulting from equipment breakdown or weather
- Summaries of QC meetings and actions recommended to be performed
- QC-testing equipment and personnel
- Identification of work locations
- Description of materials delivered to the site, including QC data provided by the suppliers
- Record of decisions made regarding defective work, corrective measures implemented, or both
- Field tests
- Sampling activities
- Signature or initial at the bottom of each page of the field log. Each entry should be dated in order to show that notes are being taken on a daily basis. A line-through will be placed on any portion of a logbook page that is unused. No correction fluid may be used.

The Project QC Manager will sign or initial the bottom of each page of the field log and date the entry in order to show that notes are being taken on a daily basis. A line-through will be placed on any portion of a logbook page that is unused.

# 8.0 Construction QC Submittals

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Construction QC submittals are generated by either the Project QC Manager or the subcontractor during or immediately before construction to demonstrate compliance with the project plans. Submittal requirements shall be tabulated in the Submittal Register according to the requirements identified in the project plans.

The QC Manager will monitor submittal activities to verify:

- Submittal completeness
- Required submittal inclusion
- Submittal schedule status
- Current submittal status
- Resubmittals

The QC Manager will log and track submittals in the Submittal Register. Specific responsibilities regarding submittals are as follows:

- Coordinating submittal actions
- Maintaining necessary submittal records in an organized fashion
- Maintaining and tracking submittals in the Submittal Register
- Reviewing and certifying submittals for compliance with the project plans, drawings, and specifications
- Approving submittals except those designated to be approved by the Navy and stakeholders
- Checking material and equipment delivered to the project for compliance with the project plans, drawings, and specifications

Certain designated submittals require approval by authorities other than the QC Manager (such as the project manager, technical lead and lead engineer, or other qualified persons). In such cases, the QC Manager forwards the submittal to the PM or project engineer who routes the submittal to the appropriate approver.

The Site Engineer and Project QC Manager are responsible for coordinating the submittal transmittal and approval process and for following through to ensure that the process does not adversely affect the project schedule.

## 8.1 Submittal Review and Control

AGVIQ-CH2M HILL will control and schedule submittals and will document the process in the Submittal Register. The Project QC Manager is responsible for updating the Submittal Register at least once a week and forwarding a copy of the submittal register to the Project Manager and Program Quality Manager at the end of each month of project work. Each

submittal will be routed on a standard submittal form. Units of weights and measures used on the submittals will be consistent with those used in the project documents.

Each submittal will be reviewed for completeness and compliance with contract requirements by individuals qualified to perform the review of that specific item. The submittal reviewers and approvers will be designated before construction.

The Project QC Manager will certify that the submittal is in compliance with the project requirements. Submittals that do not comply with the requirements will be returned to the originator for correction and re-submittal. Substitutions or variations of specified requirements will be clearly noted. Certification of the approved submittals will be indicated by signing or initialing and dating the submittal form by the Project QC Manager. Submittals include the following:

- Personnel qualifications
- Product data
- Permits
- Samples
- Catalog cuts and pages
- Production, inspection, and test reports
- Material certifications
- Progress reports, safety reports, and manpower reports
- Red-line drawing and as-built or certified data
- QC records and certifications
- Sample and test results
- QC reports
- Construction photographs and photo logs
- Contract closeout documents
- Completed hazardous waste manifests and disposal certificates

# 9.0 Change Control

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Changes to final designs, final project plans, and field changes are subject to design verification measures commensurate with those applied to the draft project plans. The project manager approves Work Plan changes in consultation with the technical lead or lead engineer.

RFIs will be used to communicate and document clarifications as well as modifications requested by the subcontractor. The RFIs will be tracked and logged by the Project QC Manager to ensure that each RFI is fully addressed and that changes to the plans, drawings, and specifications are completely and accurately documented.

## 9.1 Construction Changes

Changes to materials, supplies, work approaches, and corrective actions during construction will be documented in an overall effort to support sound engineering judgment and cost-effective project delivery. Changes during construction will be documented using the RFI process.

The RFI process involves either the subcontractor or the Project QC Manager identifying the situation in the field that requires change. When a change is identified by the subcontractor, the subcontractor reports the concern to the Project QC Manager. The Project QC Manager then prepares an internal RFI, identifying the concern, and forwards it to the Project Manager. The Project Manager reviews and either approves or forwards to the relevant personnel needed for approval. The RFI will contain the TO number, an RFI identification number, and a title to facilitate RFI tracking. The RFIs are numbered sequentially for individual TOs and filed at the job site with the Project Manager and the design team. The response should include a narrative explanation of the resolution, with any drawings or specifications required to complete the work as attachments. The response is returned to the Project Manager and forwarded to the Project QC Manager and Site Engineer for field implementation.

The RFI process is a field construction tool for documenting changed field conditions or other issues that may require a deviation from project requirements identified in the drawings and specifications. The RFI is intended to obtain input and concurrence from the lead engineer responsible for the development of the project plans. Approval of the RFI by the lead engineer does not constitute approval for AGVIQ-CH2M HILL or its subcontractors to perform work that is outside of the project scope or budget. If issues identified in the RFI may require a change to the project scope, schedule, or budget, this should be clearly conveyed in the RFI. In such instances, it is the responsibility of the Project Manager to work closely with the Contract Administrator to seek and obtain proper approval from the Navy (according to established contractual procedures) before implementing the change recommended in the RFI.

## 10.0 Noncompliance and Corrective Actions

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The Project QC Manager will notify the subcontractor of any detected noncompliance with the project requirements. The subcontractor will take immediate corrective action after receipt of such notice. Such notice, when delivered to the subcontractor at the work site, will be deemed sufficient notification. If the subcontractor fails or refuses to comply promptly, the Project QC Manager may issue an order stopping all or part of the work until satisfactory corrective action has been taken. Noncompliance notification or stop work orders will be documented in the Daily Report. Completion of corrective action will be noted on the CQCR. Verification of the corrective action and its results will be performed by the Project QC Manager and documented in the CQCR.

### 10.1 Corrective Measure Plan

Resolution of failing test results or noncompliance reports will be completed through a corrective measure plan. The corrective measure plan will be developed and documented by the Project QC Manager in conjunction with the PM. The agreed-upon plan will be implemented and documented by the Project QC Manager, who also will be responsible for its completion.

**Attachment A**  
**Project QC Forms**

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Contract Number: N624670-08-D-1006			TO No.: JM19		TO Title: Bioventing Pilot Study Site 4 - North AVGAS Tank Sludge Disposal Area						Location: Milton, FL			Contractor: AGVIQ-CH2M HILL			
Spec Section	SD No.	Item Description	Para. Number	Approving Authority	Other Reviewers	Submittal Number	Scheduled Submission Date	CCI Review Date	CCI Disposition	CCI Transmit Date	QC Admin Received Date	QC Disposition	QC Admin Transmit Date	Contracting Officer Received	Contracting Officer Disposition	Contracting Officer Return	Remarks
	None	Work Plan Rev00		US Navy - Arne Olsen		WP-00	25-Mar-14		approved					25-Mar-14	G-Approved with Comments via E-mail	3-Apr-14	Revise and Resubmit
	None	Work Plan Rev01		US Navy - Arne Olsen	FDEP/EPA	WP-01	8-Apr-14		approved					8-Apr-14	G-Approved as Noted via E-mail	10-Apr-14	Submitted to FDEP on 04/10/14 by A. Olsen. Approved with Comments by FDEP on 06/03/14.
	<b>SD-07</b>	<b>Schedules</b>															
		Project Schedule															
	<b>SD-09</b>	<b>Reports</b>															
		Technical Memorandum - completion report															
		Environmental Conditions Report															
		Analytical Reports															
		Field Data															
		Well Installation Records															
		Effluent Air Quality Calculations - discharge															
	<b>SD-13</b>	<b>Certificates</b>															
		Analytical Laboratory Certification															
		Disposal Facility Permit															
		Transporter Permit															
		Well Driller License															
		GAC Product Data															
		Land Surveyor															
	<b>SD-18</b>	<b>Records</b>															
		As-built Survey/drawings				R-01											
		Field Instrument Calibration				R-02											
		Soil Headspace Screening Test Results				R-03											
		Well Purge Data				R-04											
		Contaminated Soil/Water Disposal Profile				R-05											
		Contaminated Soil/Water Disposal Manifests				R-06											
		List of Contractor Personnel				R-07											
		Contractor Production Reports				R-08	daily										Beginning 11-04-2014
		Contractor QC Reports				R-09	daily										Beginning 11-04-2014
		Transportation and Disposal Log				R-10	monthly										Pending disposal
		Testing Plan and Log				R-11	monthly										Beginning 11-04-2014
		Monthly Summary Report of Field Tests				R-12	monthly										Beginning 11-04-2014
		Weight tickets (import fill, disposal, etc.)				R-13											
		Meeting Minutes				R-14											
		Inspection Records				R-15											
		Photo Log				R-16	monthly										Beginning 11-04-2014









# PREPARATORY PHASE REPORT

REPORT NO:

REPORT DATE:  
REVISION NO:  
REVISION DATE:

PROJECT NO:

DEFINABLE FEATURE OF WORK:

SITE/ACTIVITY:

<b>PERSONNEL PRESENT</b>	_____		
	NAME	POSITION	COMPANY/GOVERNMENT
<b>SUBMITTALS</b>	REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER.		HAVE ALL SUBMITTALS BEEN APPROVED?      YES <input type="checkbox"/> NO <input type="checkbox"/>
	IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?		
	ARE ALL MATERIALS ON HAND?      YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ITEMS ARE MISSING?		
<b>MATERIAL STORAGE</b>	ARE MATERIALS STORED PROPERLY?      YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ACTION IS TAKEN?		
<b>SPECIFICATIONS</b>	REVIEW EACH PARAGRAPH OF SPECIFICATIONS.		
	DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.		
	CLARIFY ANY DIFFERENCES.		
<b>PRELIM WORK &amp; PERMITS</b>	ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.		
	IF NO, WHAT ACTION IS TAKEN?		

		<b>PREPARATORY PHASE REPORT</b>		REPORT NO:	REPORT DATE: REVISION NO: REVISION DATE:
PROJECT NO:		DEFINABLE FEATURE OF WORK:		SITE/ACTIVITY:	
<b>TESTING</b>	IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.				
	TEST	FREQUENCY	PERFORMER		
	WHEN REQUIRED?				
	WHERE REQUIRED?				
	REVIEW TESTING PLAN.				
	HAVE TEST FACILITIES BEEN APPROVED?				
	TEST FACILITY	APPROVED?			
	YES <input type="checkbox"/> NO <input type="checkbox"/>				
	YES <input type="checkbox"/> NO <input type="checkbox"/>				
<b>SAFETY</b>	ACTIVITY HAZARD ANALYSIS APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>				
	REVIEW APPLICABLE PORTION OF EM 385-1-1 AND AHA.				
<b>MEETING COMMENTS</b>	NAVY/ROICC COMMENTS DURING MEETING.				
<b>OTHER ITEMS OR REMARKS</b>	OTHER ITEMS OR REMARKS:				
QC REPRESENTATIVE'S NAME		QC REPRESENTATIVE'S SIGNATURE			DATE



**Small Business RAC**  
**N62470-08-D-1006**

## CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE OF REPORT:

REVISION NO: 0

REVISION DATE:

TO NO: JM19	PROJECT NAME/LOCATION: Site 4 Pilot Study, NAS Whiting Field – Milton, FL	REPORT NO:
PROJECT NO: 391690	SUPERINTENDENT:	SITE H&S SPECIALIST:
AM WEATHER: Clear	PM WEATHER:	MAX TEMP:
		MIN TEMP:

### SUMMARY OF WORK PERFORMED TODAY

<b>JOB SAFETY</b>	Was A Job Safety Meeting Held This Date? <input type="checkbox"/> Yes <input type="checkbox"/> No		<b>TOTAL WORK HOURS ON JOB SITE THIS DATE</b> (Including Continuation Sheets)
	Were there any lost-time accidents this date? (If Yes, attach copy of completed OSHA report) <input type="checkbox"/> Yes <input type="checkbox"/> No		CH2MHILL On-Site Hours
	Was a Confined Space Entry Permit Administered This Date? (If Yes, attach copy of each permit) <input type="checkbox"/> Yes <input type="checkbox"/> No		AGVIQ On-Site Hours
	Was Crane/Manlift/Trenching/Scaffold/HV Elec/High Work/Hazmat Work Done?? (If Yes, attach statement or checklist showing inspection performed) <input type="checkbox"/> Yes <input type="checkbox"/> No		Subcontractor On-Site Hours
			<b>Total On-Site Hours This Date</b>
	Was Hazardous Material/Waste Released into the Environment? (If Yes, attach description of incident and proposed action) <input type="checkbox"/> Yes <input type="checkbox"/> No		Cumulative Total of Work Hours From Previous Report
		Total Work Hours From Start of Construction	

**SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED** (Include Safety Violations, Corrective Instructions Given, Corrective Actions Taken, and Results of Safety Inspections Conducted):

#### EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB

DESCRIPTION OF EQUIPMENT/MATERIAL RECEIVED	MAKE/ MODEL/ MANUFACTURER	EQUIPMENT/ CONTRACTOR	INSPECTION PERFORMED BY	NUMBER/ VOLUME/ WEIGHT

#### EQUIPMENT USED ON JOB SITE TODAY.

EQUIPMENT DESCRIPTION	EQUIPMENT MAKE/MODEL	SAFETY CHECK PERFORMED BY	NUMBER OF HOURS		
			USED	IDLE	REPAIR

**CHANGED CONDITIONS/DELAY/CONFLICTS ENCOUNTERED** (List any conflicts with the delivery order [i.e., scope of work and/or drawings], delays to the project attributable to site and weather conditions, etc.):

**VISITORS TO THE SITE:**

**LIST OF ATTACHMENTS** (OSHA report, confined space entry permit, incident reports, etc.):

SAFETY REQUIREMENTS HAVE BEEN MET

\_\_\_\_\_ SUPERINTENDENT'S SIGNATURE \_\_\_\_\_ DATE





**Small Business RAC**  
**N62470-08-D-1006**

## CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

REPORT DATE:  
REVISION NO: 0  
REVISION DATE:

TO NO: JM19

PROJECT NAME/LOCATION: Site 4 Pilot Study, NAS Whiting Field – Milton, FL

REPORT NO:

PROJECT NO: 391690

PROJECT QC MANAGER:

SITE H&S SPECIALIST:

**SAFETY MEETINGS AND INSPECTIONS----**

WAS A SAFETY MEETING HELD THIS DAY?     YES     NO    IF YES, ATTACH SAFETY MEETING MINUTES

WAS CRANE USED ON THE SITE THIS DAY?     YES     NO    IF YES, ATTACH DAILY CRANE REPORT OF INSPECTION AND CONTRACTOR CRANE OPERATION CHECKLIST

**DEFINABLE FEATURES OF WORK STATUS**

DFOW No.	Definable Feature Of Work	Preparatory	Initial	Follow-Up
1	Mobilization Site Preparation, and Utility Clearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Field Piping and Trenching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	System Installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	O&M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Waste Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Cleanup and Site Restoration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Decontamination and Demobilization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WAS PREPARATORY PHASE WORK PERFORMED TODAY?     YES     NO

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

<b>PREPARATORY</b>	DFOW No.(from list above).	TASK/ACTIVITY	PREPARATORY PHASE REPORT NO.	

**INITIAL AND FOLLOW-UP FEATURE OF WORK COMMENTS**

DFOW No.(from list above)	Phase	Comment/Finding/Action
1	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
2	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
3	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
4	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
5	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
6	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
7	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	
	Initial <input type="checkbox"/>	
	Follow up <input type="checkbox"/>	

**REWORK ITEMS IDENTIFIED TODAY  
(NOT CORRECTED BY CLOSE OF BUSINESS)**

**REWORK ITEMS CORRECTED TODAY  
(FROM REWORK ITEMS LIST)**

TASK/ACTIVITY	DATE ISSUED	DESCRIPTION	TASK/ACTIVITY	CORRECTIVE ACTION(S) TAKEN
None				





## REQUEST FOR INFORMATION

Project Name/Description:	RFI No.:		Date Submitted:
Contract/TO No:	Project No:		
<b>To:</b>			
Name			Title
<b>From:</b>			
Name			Title
<b>REFERENCES</b>			
Document ( <i>Work Plan, Scope of Work, etc.</i> ):			
Drawing(s)/Specification ( <i>Drawing No, Specification No., etc.</i> ):			
Detail/Section ( <i>Page No., Section No., Paragraph No., etc.</i> ):			
Discipline ( <i>Architecture, Electrical, Mechanical, Chemical, Hydrogeology, etc.</i> ):			
<b>POTENTIAL IMPACT:</b> Cost <input type="checkbox"/> Schedule <input type="checkbox"/> Activity/Task Impacted:			
<b>REQUEST</b>			
Requested By: <i>(Name/Company/Title)</i>		Response Requested by Date:	
<b>REPLY:</b>			
Responded By: <i>(Name/Company/Title)</i>		Date of Response:	
<b>RESPONSE DISPOSITION/ CONCURRENCE:</b>			
Response Dispositioned / Concurred With By: <i>(Name/Company/Title)</i>		Date Response Dispositioned Concurred With:	
<b>FURTHER ACTIONS REQUIRED:</b>			
<b>REVIEW DISTRIBUTION</b>		<b>FINAL DISTRIBUTION</b>	
<input type="checkbox"/> CH2M HILL PM	<input type="checkbox"/>	<input type="checkbox"/> CH2M HILL PM	<input type="checkbox"/>
<input type="checkbox"/> CH2M HILL CM	<input type="checkbox"/>	<input type="checkbox"/> CH2M HILL CM	<input type="checkbox"/>
<input type="checkbox"/> CH2M HILL QC	<input type="checkbox"/> Project Files	<input type="checkbox"/> CH2M HILL QC	<input type="checkbox"/> Project Files



Appendix E  
Maintenance and Monitoring Logs

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