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FINAL REMEDIAL ACTION WORK PLAN SITE 1 NON TIME-CRITICAL REMOVAL ACTION
FORMER NAWC TRENTON NJ
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TETRA TECH EC INC

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION CONTRACT (RAC)
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FINAL
REMEDIAL ACTION WORK PLAN
SITE 1 NON TIME-CRITICAL REMOVAL ACTION
FORMER NAVAL AIR WARFARE CENTER TRENTON
EWING TOWNSHIP, NEW JERSEY

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ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
APP	Accident Prevention Plan
bgs	below ground surface
BRAC	Base Realignment and Closure
CTO	Contract Task Order
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CMP	Corrugated Metal Pipe
CRZ	Contamination Reduction Zone
DCSRS	Direct Contact Soil Remediation Standards
DIGWSSL	Default Impact to Groundwater Soil Screening Level
DN	Deficiency Notice
EE/CA	Engineering Estimate/Cost Analysis
EZ	Exclusion Zone
FCR	Field Change Request
GMC	General Motors Corporation
GWTP	Ground Water Treatment Plant
IATA	International Air Transportation Association
IR	Installation Restoration
LDRs	Land Disposal Restrictions
mg/kg	milligrams per kilogram
MSDS	Material Safety Data Sheets
NAVFAC	Naval Facilities Engineering Command
NAWC	Naval Air Warfare Center
NCP	National Oil and Hazardous Substances Contingency Plan
NCR	Nonconformance Report
NIRIS	Naval Installation Restoration Information Solution
NJAC	New Jersey Administrative Code
NJACD	New Jersey Association of Conservation Districts
NJDEP	New Jersey Department of Environmental Protection
n.o.s	not otherwise specified
NTCRA	Non-Time Critical Removal Action
O&M	Operations and Maintenance
PPE	Personal Protective Equipment
ppm	parts per million
PQCM	Program Quality Control Manager
PSN	Proper Shipping Name
PVC	Poly vinyl chloride
QC	Quality Control
RAC	Remedial Action Contract
RACR	Remedial Action Completion Report
RAWP	Remedial Action Work Plan

RCRA	Resource Conservation and Recovery Act
RGH	Rogers, Golden, and Halpern
RI	Remedial Investigation
RPM	Remedial Project Manager
RQ	Reportable Quantity
SAP	Sampling and Analysis Plan
SHM	Safety and Health Manager
SHSO	Site Health and Safety Officer
SI	Site Investigation
SOW	Scope of Work
SPCC	Spill Prevention Control and Countermeasure
SQCM	Site Quality Control Manager
SVE	Soil Vapor Extraction
SVOCs	Semi-Volatile Organic Compounds
SWQS	Surface Water Quality Standards
SZ	Support Zone
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TSDF	Treatment, Storage, and Disposal Facility
TtEC	Tetra Tech EC, Inc.
TtNUS	Tetra Tech NUS, Inc.
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds
Watermark	Watermark Environmental, Inc.

1.0 INTRODUCTION

Tetra Tech EC, Inc. (TtEC) has prepared this Remedial Action Work Plan (RAWP) for the United States Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic under a Remedial Action Contract (RAC), N62470-13-D-8007, Contract Task Order (CTO) WE11. This RAWP was developed to describe a Non Time-Critical Removal Action (NTCRA) to remove a failed storm sewer pipe and contaminated soil at Site 1 (Site) of the former Naval Air Warfare Center (NAWC) Trenton, located in Ewing Township, New Jersey (the facility). A Facility Location Map is included as Figure 1. The RAWP has been prepared based on the Statement of Work (SOW) prepared by the Navy dated June 5, 2013.

This NTCRA is being conducted to mitigate the infiltration of groundwater contaminated with volatile organic compounds (VOCs) into the storm sewer system, which subsequently discharges to surface water. The NTCRA will remove contaminant mass that is acting as a contaminant source for the groundwater as well as remove a portion of a broken pipe that was allowing contaminated groundwater to infiltrate the sewer. This NTCRA does not interfere with the existing groundwater treatment plant (GWTP) that is currently operational at the facility.

This failed storm sewer pipe and contaminated soil are immediately adjacent to the western limit of a previous remedial action (Foster Wheeler, 2001). This failed storm sewer pipe and contaminated soil were identified during the Navy's response to a New Jersey Department of Environmental Protection (NJDEP) letter dated May 24, 2010. The letter identified the Navy's need to further evaluate and mitigate the infiltration of contaminated groundwater into storm sewer system at NAWC Trenton. In support of the Navy's response, Tetra Tech NUS (TtNUS) conducted a video inspection of the storm sewer pipe; and confirmed it had failed, thus allowing groundwater to infiltrate to pipe. Soil sampling and laboratory analysis conducted beneath the storm sewer pipe identified soil contaminated with trichloroethylene (TCE) that could provide a continuing source of contamination to ground and surface water (TtNUS, 2013). TtNUS documented the findings of this investigation in the Interim Report of Results for the West Ditch Groundwater Infiltration Investigation - Video Inspection and Soil Boring Program Northern Segment of the West Ditch Storm Sewer in May 2013. Based on this information, the Navy determined that a Remedial Action was necessary.

The NTCRA, as described in this RAWP, is being conducted under the stream-lined Engineering Evaluation/ Cost Analysis (EE/CA) Removal Action approach, while groundwater at the facility has been addressed under the Remedial Action process.

This RAWP is organized as follows:

- The introduction is presented in Section 1.0.
- The site description and background are presented in Section 2.0.
- The implementation of site activities is described in Section 3.0.
- Project management is outlined in Section 4.0.

- The Waste Management Plan is presented in Section 5.0.
- Quality control procedures are presented in Section 6.0.
- The Remedial Action Completion Report /Project Construction Completion Report is described in Section 7.0.
- References are provided in Section 8.0.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 Facility Location and Layout

The former NAWC facility is located 5 miles northwest of Trenton, New Jersey in Ewing Township, Mercer County (Figure 1). The facility, when owned and operated by the Navy, consisted of approximately 67 acres. NAWC Trenton can be found on the United States Geological Survey (USGS) Pennington and Trenton West 7.5-minute topographic maps.

The Mercer County Airport borders most of the northern and western portions of the former NAWC Trenton property. An active rail line owned by CSX Transportation, Inc. borders the facility on the east and separates Parcel C (former Buildings 1 and 2) from the remainder of the facility. Parkway Avenue abuts the southern boundary of the NAWC Trenton property. Across Parkway Avenue and east of the railroad is where General Motors Corporation (GMC)-Delphi Interior formerly operated a manufacturing facility. East of the former GMC facility is Gold Run stream and three associated ponds which drain southwesterly to the Delaware River. South of Parkway Avenue and west of the railroad tracks are several small commercial facilities. Residential and light-industrial areas are located further south and southwest of the NAWC Trenton facility.

2.2 Facility History

NAWC Trenton was commissioned in 1951 as the Naval Air Turbine Test Station. NAWC Trenton was primarily used as a testing facility for military aircraft engine performance under simulated high and low altitude conditions. Three large buildings (see Figure 2) formerly comprised the experimental engine laboratory: the Blower Wing (Building 40), the Test Wing (Building 41), and the Exhauster Wing (Building 42). By the mid-1980s, construction of cruise missile-related test equipment became a priority at the facility. An on-site industrial wastewater treatment plant, three high-capacity water cooling towers, an automotive workshop, a machine shop, a woodworking shop, fuel and lubrication laboratories, a general chemistry laboratory, and various engineering and administrative offices were also located at the facility.

Industrial wastewaters from former site operations were diverted through a central piping system to a 52-feet deep gravity basin, located between Buildings 41 and 42, known as the Barometric Well (Figure 2). The Navy decommissioned the Barometric Well in May 1998, at which time the concrete well vault was filled with gravel and capped with concrete, and the related piping was cut and sealed. Operational closure of NAWC Trenton occurred on December 15, 1998 under the Base Realignment and Closure (BRAC) Act of 1993. Several large buildings currently remain in place; however they were decommissioned and cleaned as necessary by the Navy as part of the 1998

closure activities and there are no active utility hookups between the various buildings that remain at the facility. Former macadam paved areas and driveways remain. Overgrown bushes and grasses are present in those areas that were formerly grass-covered. The building housing the GWTP equipment was added in 1995.

Environmental investigations have been conducted by the Navy at NAWC Trenton since the mid-1980s. In 1986, Rogers, Golden, and Halpern (RGH) completed a preliminary investigation that identified seven areas (Sites 1 through 7) of potential concern and recommended further investigation (RGH, 1986). Site 1 is located in the southwest corner of the NAWC Trenton facility between Buildings 40 and 41 (the Blower Wing and Test Wing, respectively) and the West-end Drainage Ditch, hereafter also referred to as the West Ditch or West Ditch Area (Figure 2). From 1951 to 1957, liquid solvents and heat exchange fluids were used for various operations conducted in a rectangular-shaped area between Buildings 40 and 41, known as the Brine Handling Area and subsequently, drained into the West-end Drainage Ditch. The Brine Handling Area measures approximately 150 feet by 300 feet and is a flat, vegetated covered area. The West Ditch was a rectangular open swale approximately 25 feet wide and 400 feet long that collects surface water runoff from various portions of the facility including the Brine Handling Area.

In 1970, the Navy installed a corrugated metal storm sewer pipe and overlying backfill within a major portion of the open swale. Groundwater and soil sampling was conducted during the initial site inspection (SI) and the remedial investigation (RI) of Site 1. Based on the RI, it was determined that soil located within Site 1 exceeded NJDEP soil cleanup criteria for select VOCs, semi-volatile organic compounds (SVOCs), and inorganic compounds. Sampling results also indicated that groundwater beneath the Site might be contaminated from the various soil contaminants. In 1998, the Navy elected to excavate the most contaminated soil for Site 1, specifically between Buildings 40 and 41, and towards Building 48, from the existing ground surface to the top of bedrock or groundwater (approximately 6 to 8 feet below grade). Following backfilling, a vegetated soil cap was installed/established over the remaining areas of the Site to limit potential for direct contact.

A Reuse Plan for NAWC Trenton was approved on July 15, 1996 and property ownership was transferred by parcel between 1997 and 2001. The Navy has in place agreements and easements with each of the current property owners to allow for access to the site, including a number of capped impacted soil areas, groundwater monitoring and extraction wells, outfalls, associated piping, and the on-site GWTP building. A chain-link fence borders the site on most sides; however a portion of Parcel A is owned and contained within the active Trenton-Mercer Airport and the fence was removed there and replaced with a new fence along the new southern boundary of the Airport property. The fence along the south and east side of the East campus has been removed. Future land use at the Site will consist of light industrial or commercial activities and residential use of Parcel C. As of 2015, no active development activities are occurring.

In September 1998 a Decision Document was issued which established limits for TCE in soil. At the time, the Impact to Groundwater Cleanup Criteria was 1.0 ppm and the Non-Residential Soil Cleanup Criteria was 54 ppm.

2.3 Regulatory Oversight

Environmental investigation and remediation activities are being conducted at NAWC Trenton under the Department of Defense Installation Restoration (IR) Program in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Under Executive Order 12580, the Navy is the lead agency responsible for implementation of the IR Program and the site investigation and remediation. Navy oversight is provided by NJDEP.

2.4 Description of Site

The West End Drainage Ditch is an area that was contaminated by TCE releases to the land surface and transported via the storm sewer system (of storm sewer pipes and open ditches). TCE was used as a heat exchange fluid in air cooling systems at NAWC Trenton. The Navy has conducted numerous repairs and replacement of storm sewer pipe to mitigate infiltration of contaminated groundwater and transport off-site (TtNUS, 2013). A volume of approximately 15,500 cubic yards of soil was excavated to bedrock (approximately 8 to 12 feet below land surface) in 1998 (Foster Wheeler, 2001).

In 2012, a deteriorated section of pipe approximately 130 feet long and ending at manhole #140 was identified as failed. The failed pipe is a subset of a 300 foot section of pipe that drains north to south. The deteriorated pipe was confirmed by video inspection in 2012. TCE was detected in soil around and beneath the pipe at concentrations up to 10 milligrams per kilogram (mg/kg) in 2012 (TtNUS, 2013). The soil and the failed corrugated metal pipe (CMP) are immediately west of the area excavated by Foster Wheeler in 1998. The most contaminated soil was identified immediately above bedrock at a depth of 9 to 10 feet (TtNUS, 2013).

In May 2013, TtNUS issued an Interim Report of Results for the West Ditch Groundwater Infiltration Investigation - Video Inspection and Soil Boring Program Northern Segment of the West Ditch Storm Sewer, which described the following activities:

- Results of the video survey of the CMP, which was conducted to evaluate the overall condition of the pipe and to determine the location(s) where infiltration may be occurring.
- Analytical results of subsurface soil samples collected from immediately adjacent to the CMP to evaluate the quality of the fill and to determine to what extent they may be the source of the site-related VOCs infiltrating the CMP. A soil sample collected from SB-07 (11 to 12 feet bgs) contained 10,000 micrograms per kilogram (µg/kg) of TCE, which is above the NJDEP Impact to Groundwater Soil Cleanup Criteria of 0.01 parts per million (ppm), but below the Non-Residential Direct Contact Soil Remediation Standard of 20 ppm.
- Analytical results waste characterization analysis (soil) to determine disposal options in the event that repairs to the CMP are required or that the Navy decides to excavate any West Ditch soils.

2.4.1 Remedy Selection Summary

Removal Action Alternatives were developed and evaluated in the EE/CA for the Site (TtEC, 2014). The alternatives included:

- Alternative 1 – No Action
- Alternative 2 – Soil Heating
- Alternative 3 – Soil Excavation and Off-Site Disposal

Removal Action Alternatives were analyzed for their effectiveness, implementability, and cost in accordance with US Environmental Protection Agency (USEPA) guidance, Conducting Non-Time-Critical Removal Actions under CERCLA (USEPA, 1993). After alternatives were individually assessed against the criteria, a comparative analysis was conducted to evaluate the relative performance of each alternative in relation to each of the criteria. A No Action alternative was evaluated as a baseline condition but is not acceptable for this Site.

Effectiveness – Alternatives 2 and 3 are technically reliable with respect to the contaminants and site conditions. Soil heating and excavation and off-site disposal are well proven methods to address contamination. There are no short-term impacts to site workers under Alternative 1. For Alternatives 2 and 3 exposure of workers during remediation would be minimized through the use of proper protective equipment and health and safety standards. Alternative 3 would have a slightly higher risk of exposure to workers, but standard industry practices would be sufficient to limit exposure.

There are no short-term impacts to the environment under Alternative 1. Activities proposed under Alternatives 2 and 3 would have minor effects on the surrounding environment. In particular, existing site vegetation would be removed. Under Alternative 2, a small amount of vegetation would be affected by the installation activities and also to house the soil vapor extraction (SVE) building. Under Alternative 3 approximately one acre would be affected. Erosion and sediment controls would be needed for Alternative 3 to control off-site migration of soil contaminants during removal of contaminated soil. For Alternative 3 hauling material off site and bringing cover soil onsite would have a short-term impact on the community by generating additional traffic. Alternatives 2 and 3 are expected to provide long-term effectiveness and permanence by removing contaminant mass from the Site.

Implementability - Alternatives 2 and 3 would use locally available materials, including soil for fill. Equipment required to implement both Alternatives 2 and 3 are readily available. Disposal capacity for the volume of soil under Alternative 3 is available. Alternatives 2 and 3 would not require operational considerations, easements or right-of-ways, or would impact adjoining properties. Alternatives 2 and 3 can be implemented within approximately the next year.

Cost - Alternative 2 would have significant startup costs including installing the heating elements as well as the SVE system. In addition, utility costs for Alternative 2 would be significant. Alternative 3 would involve moderate costs to complete, but there would be no Operations and Maintenance (O&M) costs associated with this method.

Alternative 3 was selected as the alternative to be implemented at the Site. Alternative 3 is the least costly and is equally or more effective and implementable than Alternative 2.

Removal Action Objectives - The primary objective of the planned Removal Action (Alternative 3) is to reduce the amount of VOC-impacted soil that remains in the subsurface in order to prevent the discharge of groundwater with concentrations of VOCs above the Surface Water Quality Standards (SWQS) to Parkway Avenue storm sewers and ultimately to Gold Run. This will be accomplished by removing TCE-impacted soil at the Site (via excavation and disposal). This RAWP outlines a NTCRA to remove TCE impacted soil from the Site and replace a damaged pipe with an open culvert.

3.0 Implementation of Removal Action

3.1 Summary of Selected Removal Action Alternatives

The selected Removal Action Alternative (Alternative 3) consists of the following elements:

- Removal and off-site disposal of approximately 660 yards of impacted soil
- Removal and disposal of failed drainage pipe
- Replace the removed drainage pipe with an open drainage ditch and construct headwalls to tie into the existing storm drainage system.

Soil and Pipe Excavation - Approximately 660 cubic yards of a TCE-impacted soil will be excavated from the Site and disposed off-site (Figure 3). As part of this excavation, a failed drainage pipe will also be excavated and disposed. Based on current data, this material is not expected to be a hazardous waste, but additional sampling and analysis will be conducted to confirm this classification.

Installation of Open Drainage Ditch – In lieu of repairing the damaged drain pipe, the Navy has decided to install an open-air ditch to convey the water towards the Parkway Avenue storm sewers. The will prevent infiltration of impacted groundwater into this surface water at this location.

In addition to the work described in Alternative 3 above, an additional area of soil to the north of the excavation mentioned above will be delineated and potentially excavated (soil will be disposed offsite). A soil sample collected from soil boring SB-07 in August 2012 as part of the West Ditch Infiltration Investigation contained 10,000 micrograms per kilogram (µg/kg) of TCE, which is above the NJDEP Impact to Groundwater Soil Cleanup Criteria of 0.01 ppm, but below the Non-Residential Direct Contact Soil Remediation Standard of 20 ppm. Soil sample SB-07-1112-02 was collected from a depth of 11 to 12 feet bgs (bedrock was encountered at a depth of 20 feet bgs). As the soil sample was taken at a depth that is below the water table when nearby extraction wells MW-08BR and MW-29BR are not operating, the Direct Contact Criteria should be applicable in this case.

TtEC estimates that an approximately 40 foot by 40 foot area to a depth of 20 feet may be excavated, characterized, and disposed offsite (1,800 tons). This soil may be removed to eliminate a potential source of groundwater contamination or vapor intrusion prior to redevelopment. The volume of soil to be removed will be determined by the results of soil delineation investigation.

3.2 Work Elements

The major definable work elements for implementing this Removal Action include:

- Preparation of a RAWP, Sampling and Analysis Plan (SAP) (provided as Appendix A), and Accident Prevention Plan (APP) (provided as Appendix B)
- Mobilization
- Land Surveying
- Soil Pre-Classification and Delineation Investigations
- Erosion and Sediment Control
- Excavation, Transportation, and Disposal of Soil
- Confirmation Sampling
- New Culvert Installation
- Site Restoration
- Close-Out Report

The technical elements required to implement the Removal Action are detailed below in Section 3.3.

3.3 Technical Requirements

3.3.1 Pre-Construction Activities

Upon approval of project plans, procurement for all necessary equipment, materials, and subcontractors required to execute the work will be initiated. It is anticipated that subcontractors will be utilized for the following services:

- Transportation and disposal
- Analytical laboratory
- Driller
- Land surveyor

TtEC will facilitate one pre-construction meeting to be held at the Site prior to mobilization. Attendees will include TtEC, the Navy, and Watermark Environmental, Inc. (Watermark). The following topics will be discussed at the meetings:

- Overall approach to site work
- Access/security requirements
- Staging areas
- Schedule and specific tasks included

- Review of RAWP and associated documents

TtEC will issue Draft and Final meeting minutes.

3.3.2 Mobilization

All personnel, tools, materials, equipment and supplies required to complete the work and to comply with the contract documents and local, State, and Federal laws and regulations will be transported to the Site. The field staff will consist of a Project Superintendent, a Site Health and Safety Officer (SHSO), subcontractors, and craft labor. Mobilization activities will include the following:

- TtEC will set up support facilities near the location of the excavation. A project field office will be established as part of these facilities. Cellular phone service will be used.
- Prior to any intrusive activities, TtEC will contact NJ One Call to identify buried obstructions and utilities in the excavation area. The locations of the existing pump and treat system piping will also be marked by the Navy prior to beginning excavation. TtEC will mark the area excavated in 1998 and the locations of the soil borings advanced by TtNUS in 2012. These markings will be confirmed with the Navy during the pre-construction meeting.
- All Site personnel will be required to attend an initial health and safety meeting to discuss site-specific safety issues for this project. The meeting will be conducted by the SHSO and will take place prior to the start of fieldwork.

In addition, site control will be implemented in accordance with the APP. Site zones will be established to control contamination migration throughout the Site and off-site roadways. Specific zones (exclusion zone, contamination reduction zone, and support zone) will be established for on-site intrusive activities. The SHSO may need to adjust the boundaries of the specific zones as work progresses. A description of each zone is as follows:

- All intrusive activities, which may involve exposure to hazardous materials and/or conditions, will be contained within an exclusion zone (EZ). This zone will be clearly delineated by a fence, tape, cones, or other means. The area will be prepared to accommodate all intrusive activities, field personnel, and emergency equipment.
- The area just beyond the EZ is called the contamination reduction zone (CRZ). The CRZ contains the contamination reduction corridor, which provides an area for decontamination of heavy equipment, hand-held equipment, and personnel. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.
- The support zone (SZ) is the uncontaminated area following the CRZ and will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate safety equipment will be located in this zone.

3.3.3 Pre-Construction Land Surveying

TtEC's land surveyor (professional land surveyor in the State of New Jersey) will perform a topographic survey to document existing site conditions, mark the limits of excavation, and identify the delineation soil boring locations. The soil boring location information and sample analytical data will be uploaded into Naval Installation Restoration Information Solution (NIRIS) prior to the end of the project.

3.3.4 Soil Pre-Classification and Delineation Investigation

Prior to beginning the excavation activities, TtEC will conduct a soil pre-classification investigation at both Site 1 West End Drainage Ditch Area north of MH-140 and also at the area around former soil boring SB-07 excavations by advancing soil borings via a hollow stem auger drill rig. It is expected that soil borings will be completed to bedrock and that samples will be collected throughout the length of the boring. The purpose of this investigation is to determine the disposal options for the soil to be excavated and obtain disposal facility approval prior to beginning excavation. This will allow for direct load of soil into trucks without having to stockpile the soil on-site. The analytical parameters and number of soil pre-classification samples will be established by the disposal facility, which has not been chosen yet, but it is expected that the samples will be analyzed for VOCs and metals, at a minimum.

In addition, in the area of soil boring SB-07, a total of nine soil borings will be advanced to bedrock to delineate the vertical and horizontal extent of the northern removal area. Two soil samples will be collected from each of these borings and analyzed for TCE. The samples are expected to be collected from the 9 to 10 foot and 11 to 12 foot intervals, which is where the TCE concentration of 10,000 µg/kg was detected at former SB-07 in 2012. Figure 3 depicts the location of the borings. All pre-classification and delineation samples will be analyzed via standard turnaround time. All samples will be collected in accordance with the project SAP (see Worksheets #18, 19, 20, and 30).

3.3.5 Erosion and Sediment Control

Prior to the commencement of construction activities on the Site, TtEC will install erosion and sediment control measures (silt fence and/or hay bales) at the Site in accordance with the New Jersey Standards for Soil Erosion and Sediment Control (New Jersey Association of Conservation Districts [NJACD], 2014). Additional erosion and sediment controls will be placed around each open excavation to prevent overland flow from entering an excavation and sediment from migrating beyond excavation limits during storm events and high groundwater conditions. TtEC will maintain the integrity of the erosion and sediment control devices throughout the duration of the project. Inspections will be documented, and any damages will be repaired immediately. At the completion of excavation and restoration activities, the erosion and sediment controls will be removed and disposed.

The Navy will coordinate with the operations and maintenance contractor, Watermark, to ensure that the groundwater extraction system is operating to lower the water table in the area of the excavation. Watermark (under a separate contract with the Navy) will adjust pumping rates, which

will reduce or eliminate groundwater from entering the excavations. In the event groundwater continues to enter the excavations, TtEC will dewater the excavations by pumping the water to a portable tank (to be mobilized by TtEC). TtEC will then transfer the water to the GWTP for treatment.

Prior to the removal and disposal of the failed drainage pipe, surface water from the spring will be diverted so that water does not continue to enter the failed pipe. TtEC will install a sump (no deeper than 4 feet deep) north of the area to be excavated, line the sump with poly sheeting and secure the lining with gravel. A pump will then be used to move water from the sump through tubing to manhole MH-140, which discharges to the oil/water separator in the southwestern portion of the NAWC Trenton. As quarterly sampling of the water from the spring has indicated that the water is below applicable groundwater and/or surface water standards, sampling of this water will not be performed.

In addition, the roof drain will be disconnected to the existing CMP to prevent roof drain water from entering the excavation. A new roof drain pipe will be connected to the gutter as described in Section 3.3.8.

3.3.6 Excavation, Transportation, and Disposal of Soil

It is assumed that the excavation will be performed using a track mounted excavator. Prior to initiating the excavation, a path for the trucks that will carry the soil off-site to the disposal facility will be determined. If necessary, the path will be reinforced with gravel to ensure the trucks will not get stuck and to limit the amount of soil on the tires as the trucks travel off-site. The excavator will then place the soil directly into the bed of the truck. The truck will travel to the on-site staging area where the paperwork will be checked and the load secured prior to the truck leaving the site. Before the trucks leave the site, they will be inspected to ensure that there is no visible contaminated soil on the vehicle sides or tires and that the tarp cover is secured.

The only item that should need to be decontaminated is the excavator bucket. Decontamination will be performed once all of the work has been completed and the excavator is being prepared to be shipped off-site. The bucket will be dry decontaminated using a brush to remove any soil that remains on the equipment. If a sufficient amount of soil is present on the bucket, the soil will be collected and containerized in a United States Department of Transportation (USDOT) specification drum. At the conclusion of the project, the collected solids will be disposed of off-site (based on the waste characterization results obtained in the beginning of the project).

Soil will be removed from two excavations in the Site 1 West End Drainage Ditch Area; one will be approximately 14’ wide by 80’ long by 10’ feet deep and the other will be approximately 6’ wide by 50’ long by 6’ feet deep. The two excavations will be adjacent to each other as shown on Figure 3. The depth of the excavation will be determined by the depth of bedrock encountered while excavating. The excavation activities will also include removal of the damaged stormwater pipe described in Section 1.0. TtEC plans to segregate the removed pipe from the soil and dispose offsite. If the soil disposal facility allows the pipe debris to be disposed with the soil, TtEC will combine the material.

In addition, an approximately 40' wide by 40' long by 20' deep area may be excavated just north of the Site 1 West End Ditch Area in the vicinity of former soil boring SB-07 as shown on Figure 3. This area will be further investigated as described in Section 3.3.4; and a removal action will be based on the results of this investigation.. The decision to perform a removal action will be based on review of the soil samples results, comparison of them to the appropriate NJDEP Standards (Default Impact to Groundwater Soil Screening Level [DIGWSSL] in the unsaturated soil and the Direct Contact Soil Remediation Standards [DCSRS] in the unsaturated and saturated soil), and discussions with the Navy and NJDEP. The excavation will be completed to remove soil that has a concentration of VOCs that are over the appropriate NJDEP Standard. Upon completion of the excavation, the area will be backfilled to match existing grade. Post excavation soil samples may also be collected in order to evaluate the concentrations of VOCs that remain in the subsurface.

Due to the depth and steep surface grade, a protective system (trench shields) may be installed to stabilize soil from cave-in and to protect and stabilize adjacent structures that could be undermined. As described in the APP, a Competent Person will be onsite during excavation and backfilling activities.

At the present time, there is no identified need for personnel to enter the excavation to perform any currently identified work tasks at depths greater than 4 feet (with Competent Person approval) and this plan does not include excavation entry requirements and safety precautions other than herein. If the need for entry into the excavation is identified and an excavation is greater than 4 feet in depth, this RAWP and APP will be updated to contain the requirements for conducting entry in a safe manner, including confined space entry considerations that must be addressed.

3.3.7 Confirmation Sampling

Once the excavations have been completed, confirmatory soil samples will be collected from the base of the sidewalls of the excavation or at the zone that is zero to six inches above the water table. A maximum of 40 confirmatory samples will be collected from the Site 1 West End Drainage Ditch Area excavations; no more than 20 confirmatory samples will be collected from the excavation just north of the Site 1 West End Ditch Area.

The sampling protocol is designed to determine the level of soil contamination remaining in the subsurface. The sampling will be performed in accordance with the protocol established in the SAP provided in Appendix A. Confirmatory soil samples will be analyzed for Target Compound List (TCL) VOCs and Target Analyte List (TAL) metals only via standard turnaround time. Excavations will be backfilled before confirmatory sample results are obtained from the laboratory (the new stormwater drainage will also be installed prior to receipt of confirmatory sample data). All sample locations will be documented within a sample log book, and located on a Site Map.

3.3.8 New Gutter Installation at Site 1 West End Drainage Ditch Area

As a replacement for the removed pipe, a concrete gutter will be installed as a replacement for the existing underground pipe. The gutter will prevent infiltration of groundwater into the storm sewer system as well as allow additional aeration of the water prior to entering the storm sewer system.

The gutter will be formed from a 0.3 inch thick concrete cloth (Milliken® Concrete Cloth™) that will be placed on the compacted fill material with a fal1 of 8 inches across the run of the ditch matching the existing fall or the current pipe. The fill will be graded to match the fall across the ditch and to ensure a smooth surface for the placement of the concrete cloth. Appendix D contains additional information regarding installation of the concrete cloth.

The concrete cloth will be rolled along the prepared surface on the base of the ditch in one continuous piece per the manufactures directions with the top side up. At the northern end of the ditch, the cloth will be placed under the existing drainage pipe to ensure the hydraulic connection between the pipe and the ditch. At the southern end, the cloth will be placed within the existing drainage pipe to direct the flow of water into the existing storm drain system. Along all exterior edges (sides) of the concrete cloth installation, a toe-in trench (minimum 6 inches in depth) will be installed to resist migration of surface water between the concrete cloth and the subgrade. Once the concrete cloth is secured in position, it will be hydrated as described below.

Complete hydration of the concrete cloth is critical to optimal performance. Concrete cloth cannot be overhydrated and incomplete hydration may result in reduced strength. Hydration will be done with the onsite municipal water supply from the GWTP.

Hydration will be completed as follows:

1. Saturate the top-side of the concrete cloth material. This will take multiple passes of a moderate spray of water from a garden hose or other source. More water will be required to saturate the product as the slope of the installation increases.
2. Ensure that the concrete cloth has been saturated by means of the “thumb test”, where a thumb is pressed into the concrete cloth and water is observed to pool in the indentation.
3. After 30 to 60 minutes, apply a final dose of water onto the concrete cloth to ensure complete hydration.

The concrete cloth will not be disturbed for at least 24 hours after hydration has been completed. The new gutter will be fenced off to prohibit access during this time.

A new roof drain connection will be installed at the northern end of the ditch in the approximate location of the existing drain. The existing drain will be removed as required. The soils under the removed drain will be compacted and imported fill will be used to bed the new drain pipe. The new drain pipe will be schedule 80 poly vinyl chloride (PVC) and have glued connections at any joints and shall be the same diameter as the existing drain or larger. The fall along the new drain pipe will match the existing drain pipe or steeper if the outfall ends up lower than the existing out fall. The out fall will be located above the final elevation of the gutter eastern edge and will over hang the gutter by at least six inches.

3.3.9 Site Restoration

Once the confirmation soil samples have been collected (described in the SAP), imported fill will be used to create the new surface elevations. Imported fill will be sampled in accordance with the project SAP and will meet New Jersey Soil Remediation Standards. The crushed stone and topsoil

will be in compliance with the alternative/clean fill requirements in the N.J.A.C. 7:26E-5.3(b) through (g), and as described in the New Jersey Fill Material Guidance for SRP Sites, April 2015, Version 3.0 (Fill Material Guidance).

The new elevations will provide a 1:1 slope from the edge of the excavation to the level of the gutter. The gutter elevation will match the elevation of the existing pipe. In order to reach the 1:1 slope, additional material may need to be removed from the excavation (see Figures 4 and 5). Any material that is removed for this purpose will be utilized for backfill in the excavation.

Following the completion of backfilling activities, the excavated areas will be restored. Restoration will include backfilling the excavations to the newly established grade with imported fill and compacting in-place as needed. Crushed stone will be used for the majority of the backfill, with six inches of topsoil as a cover. The slope of the restored area will be 1:1. This should result in a final ditch that ranges from approximately 10 feet wide near the intersection with the underground pipe to approximately 12 feet wide at the start of the trench and gutter. An appropriate grass seed mixture will be used to restore the surface.

3.3.10 Post Construction Survey

Once the excavation areas have been restored to final elevation, a licensed surveyor will perform a site survey to obtain final grading elevations. A topographic map depicting post-construction elevations will be provided with the completion report.

3.3.11 Demobilization

Upon completion of site restoration, TtEC will begin demobilization activities. Demobilization will include:

- Site cleanup;
- Removal of all temporary structures, appurtenances and equipment;
- Removal of all disposable items, dumpsters, and portable toilets;
- Demobilization of construction equipment; and
- Navy Remedial Project Manager (RPM) approval and acceptance of site conditions.

TtEC personnel will demobilize from the site upon completion of all site restoration activities and after the demobilization activities listed above are performed. This final demobilization will be implemented when it is determined by the Project Manager to be most practical and cost effective.

4.0 PROJECT MANAGEMENT

The project management team will be responsible for all technical and administrative aspects of the site investigation and removal action. The project management team is configured such that one person, Mr. Derek Pinkham, has overall administrative and technical responsibilities for this CTO. As the CTO Manager, Mr. Pinkham reports directly to Mr. Carl Tippmann, the RAC Program Manager. Mr. Pinkham is responsible for planning and scheduling the removal actions,

ensuring that project deliverables are submitted on a timely basis, tracking and managing budgets and schedules, and maintaining a safe work environment and a record of site activities. Mr. Pinkham will also attend any Quality Control (QC) meetings to discuss schedule and progress updates with the Navy, as required.

4.1 Project Schedule

Mobilization is anticipated to occur in September 2015, and the duration of field activities is estimated to be six months.

4.2 Project Staffing Plan

The field staff will consist of a Project Superintendent, a field engineer/SHSO, subcontractors, and craft labor. The responsibilities of each role are discussed in the following sections.

4.2.1 Project Superintendent

The Project Superintendent (to be determined) will be responsible for managing and directing all on-site activities. These activities include supervision of all field staff and subcontractors, procurement of materials, interfacing with the RPM, and ensuring compliance with this RAWP.

4.2.2 Site Health and Safety Officer

The SHSO (to be determined), who will be responsible for all site-related health and safety issues, will act on behalf of the Corporate Safety and Health Manager (SHM), Mr. Roger Margotto. The SHSO will enforce all aspects of the APP and has the authority to stop work if unsafe conditions arise.

4.2.3 Site Quality Control Manager

The SHSO will also serve as the Site Quality Control Manager (SQCM) and will act on behalf of the Program Quality Control Manager (PQCM), Mr. Greg Joyce. The SQCM be responsible for all site-related QC activities, including the enforcement of the QC Plan (Section 6.0 of this RAWP) and tracking all field documentation and submittals.

5.0 WASTE MANAGEMENT PLAN

5.1 Objective

The objective of this section is to facilitate the proper handling, on-site management, transportation, and disposal of hazardous and non-hazardous wastes generated during this removal action. All wastes generated by the project are expected to be non-hazardous, however this section includes measure for managing hazardous wastes if they are encountered. This objective will be achieved through compliance with federal, state, and local regulations. This section identifies the waste streams and waste management responsibilities of TtEC, the Navy, transporters, and disposal facilities. This section also describes the waste management practices that will be

implemented for containing, classifying, segregating, staging, storing, marking, labeling, transporting, and disposing of the generated wastes.

5.2 Navy Assistance

The Navy RPM or his designee will review all submittals designated for Navy approval. These submittals will include waste analysis and classifications, waste profile/approval forms, Land Disposal Restriction certifications, manifests/shipping papers, and manifest discrepancy and exception reports. TtEC will rely on the Navy to provide approval of final waste characterizations and sign as the generator of all waste streams leaving the Site. Both the Navy and TtEC will review and approve the qualifications of all treatment/disposal facilities and transporters.

5.3 Waste Streams

The waste streams to be generated may include the following:

- Excavated soil
- Drill cuttings
- Development water
- Decontamination liquids
- Personal protective equipment (PPE)

The wastes will be sampled and analyzed for the parameters indicated by the selected disposal facility. It is assumed that excavated soil, removed CMP, drill cuttings, and PPE will be disposed as non-hazardous waste. Development water and decontamination liquids will be disposed at the facility's GWTP.

5.4 Sample Shipment

Off-site laboratory services will be utilized for this project. If samples are shipped by an overnight service that uses air transportation (e.g., Federal Express), site personnel will coordinate with the project Regulatory Specialist to determine if the samples must be packaged according to the International Air Transportation Association (IATA) Dangerous Goods Regulations. If samples are being shipped over the road by common carrier, a courier service used by the laboratory, or site personnel in a company or personal vehicle, the project Regulatory Specialist will be consulted to determine if the samples must be packaged according to USDOT hazardous materials regulations.

5.5 On-Site Waste Management

5.5.1 Containerization

All waste streams will be evaluated prior to generation to determine the most cost-effective method of handling, transportation, and offsite disposal. Containerized wastes (drill cuttings, PPE, and any soil removed from disposal truck tires prior to leaving site) will be stored in USDOT specification containers conforming to 49 Code of Federal Regulations (CFR) 178 performance-

oriented packaging requirements. Bulk and non-bulk containers may be considered based on the estimated volumes of waste to be generated, however, it is anticipated that the excavated soil will be placed directly into trucks for off-site disposal. It is anticipated that decontamination liquids and monitoring well development water will be transferred to the GWTP. PPE, which is typically characterized as non-regulated material, may be bagged for off-site disposal as a non-hazardous solid waste. If gross contamination exists on the PPE and it has been determined that the excavated soil is a hazardous waste, an evaluation of PPE disposal options will be performed. It may be necessary to dispose of the PPE as a hazardous waste. The disposable sampling equipment will be bagged and disposed of with the PPE.

5.5.2 Container Marking and Labeling

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

- Source and location
- Contents of material in the container (type of material and expected hazards)
- Accumulation start date (the date the first amount of material was put in the container)
- Unique drum or roll-off identifier
- Date container was sampled
- Special handling instructions

Upon receipt of analytical results, containers will be immediately labeled with commercially available labels (either hazardous or non-hazardous waste labels will be used). Based upon final waste classification, the project Regulatory Specialist will select a USDOT shipping name for any USDOT hazardous material. The project Regulatory Specialist will direct application of any required USDOT markings and labels specific to the Proper Shipping Name, ID Number, and Hazard Class. If classified as a Resource Conservation and Recovery Act (RCRA) hazardous waste, completion of the USEPA Hazardous Waste Label meets the USDOT requirements for consignor/consignee, name, address, and contents.

5.5.3 Accumulation/Storage

All containers will be staged at the designated central waste accumulation/storage area(s) on-site. Any hazardous waste accumulation area will comply with the requirements of the applicable state and federal regulations for on-site storage and management. Hazardous waste will be stored on-site, in a central 90-day hazardous waste accumulation area, for less than 90 days from the point of generation unless a generator storage limit extension is obtained.

The Site Superintendent or SHSO will serve as the emergency coordinator of the waste accumulation/storage area(s) and will be responsible for coordinating any emergency response activities related to waste storage area spills/releases. The following information will be posted at the accumulation area(s) at all times:

- Name/phone number of emergency coordinator

- Location of fire extinguisher and spill control materials
- Telephone number of the base fire department
- Signage: "Authorized Personnel Only"
- Signage: "Hazardous Waste," if hazardous wastes are present

5.5.4 Container Inspections

Project personnel will inspect waste accumulation/storage area(s) weekly while the fieldwork is in progress to ensure proper labeling and secure closure, and to assess the condition of each container, the number of containers, and the condition of the storage area. Any signs of deterioration, leaking, or dents will be noted and containers will be immediately overpacked, if necessary. Inspection results and corrective actions will be documented in writing, and the date and time of inspection and the inspector's signature will be provided on each inspection log.

5.5.5 Waste Container Inventory Log

A waste container inventory log will be prepared and maintained in the project file. The log will include the following information for each waste container:

- Unique drum ID or roll-off number, as applicable
- Date waste generated
- Waste name/location generated
- Date sampled
- Waste classification
- Date shipped or disposed of off-site
- Disposal location
- Manifest or Bill of Lading number.

5.6 Transportation and Disposal Plan

5.6.1 Treatment, Storage, and Disposal Facility (TSDF) Selection

The proposed TSDF must be approved under TtEC subcontracting policies and procedures, which require the facility:

- Is in physical compliance with RCRA or other applicable federal and state laws.
- Is not releasing any hazardous wastes, hazardous constituents, or hazardous substances.
- Meets minimum technology requirements.
- Has a corrective action program in place to address all releases, including environmentally significant releases at non-receiving units.

The TSDF must demonstrate a properly designed system, and must presently operate (and historically have operated) in a manner that controls the types of materials accepted for disposal. Landfill operators will return invoices (or manifests for RCRA hazardous wastes) verifying that the waste was received and properly disposed.

5.6.2 Waste Transporter Selection

To ensure safe transport of the waste, only transporters who have demonstrated good safety practices (as documented in the USDOT online safety information database) and possess the required federal and/or state licenses and/or permits, as well as liability insurance coverage, for transporting waste will be used. If not already approved, the project Regulatory Specialist will perform a regulatory compliance review on all waste transporters to be used. TtEC policies and procedures for subcontracting will be followed. Transporter USEPA/State identification numbers will be kept in project and compliance files. RCRA Hazardous Waste transport will be conducted under applicable 40 CFR 262 and 263 regulations, as well as USDOT Hazardous Materials Regulations (49 CFR 171-180).

5.6.3 CERCLA Off-Site Rule

Because the soil/CMP debris is being generated by a CERCLA action, the RCRA Subtitle D facility will be evaluated to ensure it is approved by USEPA under the CERCLA Off-Site Rule to receive CERCLA waste in accordance with 40 CFR 300, Section 440. In the event the waste is hazardous waste, it will be disposed of at a RCRA Subtitle C landfill; otherwise the waste will be disposed of at a RCRA Subtitle D landfill or other appropriate treatment facility.

5.6.4 Land Disposal Restrictions

Land Disposal Restrictions (LDRs) prohibit placement of RCRA hazardous wastes on or in the land, except in a USEPA approved disposal or management unit. LDRs specify treatment technologies and treatment standards for RCRA hazardous wastes. All RCRA Characteristic wastes will be subject to the LDR treatment standards for any Underlying Hazardous Characteristic identified in the waste, in addition to the waste's primary hazardous characteristic. The project Regulatory Specialist will identify LDRs for site-generated RCRA wastes and will prepare Generator Land Disposal Restricted Waste Notification and Certification forms required for all off-site hazardous waste shipments. The Notification and Certification forms will be provided to the Navy for review and signature prior to off-site waste shipments.

5.6.5 USDOT Requirements

TtEC will comply with the following requirements for transporting any USDOT hazardous materials, including any hazardous sample shipments, for off-site disposal. Hazardous materials will be properly classed, described, packaged, marked, labeled, and in condition for shipment as required by 49 CFR 172.

Waste that does not exhibit one of the nine USDOT hazard class characteristics (i.e., explosive, flammable, poison, combustible, etc.) is not regulated under USDOT rules for the transportation of hazardous material. If waste is suspected to be a USDOT hazardous material, then it will be shipped under the suspected hazard class. If a particular hazard class is unable to be determined (e.g., when shipping samples to a laboratory for analyses), then the soil or water may be shipped under either of the following:

Shipping Name	Hazard Class	ID Number	Packing Group	Label
Environmentally hazardous substances, liquid, n.o.s.	9	UN3082	III	CLASS 9
Environmentally hazardous substances, solid, n.o.s.	9	UN3077	III	CLASS 9

When using either one of these "n.o.s." (not otherwise specified) shipping names, at least two technical names suspected to be present must follow (i.e., "Environmentally hazardous substances, liquid, n.o.s. [Benzene and Acetone]"). USDOT also allows the technical names to be omitted for sample shipment if a "best guess" using professional judgment cannot be made).

The proper shipping name, identification number, instructions, cautions, weights, USEPA waste code numbers, and consignee/consignor designations will be marked on packages for shipment. Labeling provides information regarding the USDOT hazard class.

The label to be placed on the material will depend upon the results of sampling. Once the waste is characterized, reference will be made to the Hazardous Materials Table in 49 CFR 172.101 to determine the appropriate label. The package (or drum) will be marked and labeled as specified in 49 CFR 172.301.

The person offering hazardous material for shipment will provide placards (49 CFR 172.506). Any quantity of material listed in Table 1 and > 1000 pounds of a Table 2 material of the regulations shall be placarded. However, if there are less than 1,000 pounds of a Table 2 material, a placard is not required. A Class 9 placard is not required for domestic shipments (i.e., within the U.S.). If a placard is required, the label referenced above will be affixed on each side and each end of the vehicle(s).

Hazardous material shipping papers will have the following description of the hazardous material, in the following order:

- Proper Shipping Name (PSN)
- Hazard class or division
- Identification number
- Packing group
- Total quantity (must appear either before or after the above information)
- Technical and chemical group names may be entered in parentheses between the PSN and hazard class or following the basic description (e.g., "Flammable liquids, n.o.s. [contains xylene and benzene], 3 UN1993, PG II")
- The word "Waste" must appear before the PSN if the material is a RCRA hazardous waste and the word "waste" is not part of the PSN
- The letters "RQ" must be placed either before the PSN or after the Packing Group if a hazardous material equals or exceeds its Reportable Quantity (RQ) in one container (e.g., drum, roll-off).

Other required information includes:

- USEPA identification (manifests)
- Emergency Response Guidebook numbers listed on DOT shipping paper or manifest
- Twenty-four-hour emergency response number, supplied by the generator and answered by a knowledgeable person
- Signatures
- Shipper's certification.

All TtEC and subcontractor personnel involved in USDOT Hazardous Material Shipment activities will have been trained in accordance with personnel training requirements outlined in 49 CFR 172 Subpart H.

5.6.6 Complete Manifest Packages

Non-hazardous wastes will be generated during this project (hazardous wastes are not anticipated to be generated). Wastes will be disposed of in accordance with RCRA hazardous waste (if applicable) and New Jersey waste regulations. The USEPA Uniform Hazardous Waste Manifest will be used to ship all RCRA Hazardous Wastes. . Non-hazardous waste will be shipped on a Bill of Lading (or non-hazardous waste manifest if required by the receiving facility). The principal components of the completed manifest package that will be submitted to the Navy may include:

- Shipping papers (e.g., Hazardous waste manifests, Bills of Lading, or other non-hazardous waste manifests)
- Waste profile sheets
- LDR notification and certification forms.

Supporting information will contain:

- Waste generation process
- Waste classification
- Analytical results
- Material Safety Data Sheets (MSDSs)
- Additional information reviewed in identifying the proper USEPA or State waste code
- USDOT waste packaging, labeling, marking, manifesting, and placard requirements.

5.6.7 Manifest Package Submittal

TtEC will submit to the Navy for review and signature a reproducible copy of the complete manifest or bill of lading package for each individual waste stream as soon as possible after waste classification and disposal facility approvals have been obtained. The Navy (as the generator) will be responsible for signing all hazardous waste manifests, LDR Waste Notification/Certification forms, and Bills of Lading for off-site waste shipments. The project Regulatory Specialist will

hold the original complete manifest package and make corrections based on the Navy review prior to off-site shipment.

Within 24 hours of the transporter signature and off-site shipment, the project personnel will provide the Navy with two copies of the manifest and the remainder of the approved complete manifest package.

5.6.8 Recordkeeping Requirements

Records must be kept for all hazardous waste activities. Records to be retained include all hazardous waste manifests, LDR Waste Notification/Certification forms, manifest exception reports, Bills of Lading/non-hazardous waste manifests for non-hazardous waste shipments, and records of any test results, waste analyses, and waste profile sheets for at least three years after the waste was disposed. TtEC will retain photocopies of all waste documentation in the project file and will forward original copies of all manifests, LDR forms, and Bills of Lading to the Navy.

5.6.9 Discrepancy Reports

Any discrepancies between the quantity and type of waste designated on the manifest or shipping papers and the quantity or type of waste a facility actually receives must be reported. TtEC will investigate these discrepancies, rectify the identified discrepancy, and report to the Navy within 15 days of receipt of the waste by the disposal facility.

5.6.10 Exceptions Reports

If, by the 35th day after the transporter signs the manifest, the Navy has not received a signed copy of the signed manifest from the TSDF, TtEC will contact the TSDF by phone to obtain a signed copy. If the Navy has not received a signed copy of the manifest by the 38th day, an exception report will be prepared. This exception report will be submitted to the Navy for review and approval no later than the 40th day. TtEC will document all calls to locate shipments and submit the documentation with the exception report. The Navy (as the generator) will submit the signed exception report to the USEPA Regional Administrator prior to the 45th day.

5.7 Spill Prevention

Every effort will be made, through proper planning and management of the transportation process, to prevent the potential for a spill or release of hazardous substances. Contingency measures, however, will be in place in the case of such an occurrence. This includes providing personnel, equipment, and materials to control, contain, and cleanup any spilled material that may adversely affect the health of the public or the environment. Transporters responsible for taking waste materials to the designated disposal facilities will be required to provide and implement their own Emergency Response Plan which will be reviewed and approved by TtEC prior to the start of work. All vehicles will be inspected prior to leaving the area of contamination for leakage or materials adhering to the wheels or undercarriage.

The following equipment will be available at all times for quick response to unexpected spills:

- Sorbents and spill cleanup materials, including spill control pillows, absorbent booms, packs, and blankets
- 55-gallon containers
- Shovels, brooms, and similar hand tools

Additional information relative to spill response can be found in the APP. A Spill Prevention Control and Countermeasure (SPCC) Plan will not be required for this project.

6.0 QUALITY CONTROL PLAN

6.1 Introduction

This section outlines the quality control inspection, documentation, and testing activities required to ensure that all work that is performed complies with the specified scope, schedule, budget, and level of quality anticipated by the Navy, as well as the requirements of applicable regulations. It identifies the project-specific quality control requirements for the scope of work addressed in this RAWP.

6.2 Scope of Work

The scope of field activities includes soil pre-classification and delineation, soil and pipe removal, confirmatory sampling, site restoration, and preparation of a Remedial Action Completion Report (RACR)/ Project Construction Completion Report.

6.3 Definable Features of Work

A definable feature of work is a task that is separate and distinct from other tasks and has separate control requirements. The definable features of work that relate to this project are listed below:

- Mobilization/Demobilization
- Soil Delineation/Waste Classification (soil borings advancement via hollow stem auger drilling)
- Soil Excavation
- Stormwater Gutter Installation
- Backfill and Site Restoration
- Monitoring Well Installation (via hollow stem auger drilling)

Additional definable features may be identified as the work progresses.

6.4 Inspection Process

The PQCM will be responsible for verifying compliance with this plan section through the implementation of the three-phase control process as described in below. This process will ensure that all project activities comply with the approved plans and procedures.

The PQCM will ensure that the three-phase control process is implemented for each of the definable features of work listed above or subsequently identified, with the exception of mobilization and demobilization. The PQCM will conduct inspections on mobilization and demobilization activities as needed without notifying the Navy. All other definable feature work will not be performed until the preparatory inspection has been performed.

6.4.1 Preparatory Phase Inspection

A preparatory phase inspection will be performed prior to beginning each definable feature of work. The purpose of this inspection will be to review the work scope and applicable specifications and verify that the necessary resources, conditions, and controls are in place and compliant before the start of work activities. This inspection will be conducted using the Preparatory Inspection Checklist in Appendix D.

6.4.2 Initial Phase Inspection

An initial phase inspection will be performed for each definable feature of work once a representative sample of the work has been completed. The purpose of the inspection will be to check the preliminary work for compliance with procedures and specifications, verify inspection and testing, establish the acceptable level of workmanship, review the minutes of the preparatory phase, and check for omissions and resolve differences of interpretation. This inspection will be conducted using the Initial Phase Inspection Checklist attached in Appendix D.

6.4.3 Follow-up Phase Inspection

A follow-up phase inspection is performed each day that work on a definable feature is performed. The purpose of the inspection is to ensure continuous compliance and level of workmanship. The PQCM will observe the same activities as during the initial inspection and ensure that discrepancies between site practices and approved specifications are identified and resolved. Corrective actions for unsatisfactory conditions or practices will be verified by the PQCM prior to continuing work on the affected feature. This inspection will be recorded on the Contractor Quality Control Report form in Appendix D.

6.5 Deficiency Management

All deficiencies or nonconforming conditions discovered during inspections or other QC functions will be noted on a Deficiency Notice (DN) or a Nonconformance Report (NCR), as appropriate. Copies of these forms are included in Appendix D. A Deficiency/Nonconformance log will be maintained on-site.

6.6 Quality Control Meetings

6.6.1 Project Kickoff and Mutual Understanding Meetings

A project kickoff call with the Navy RPM and TtEC's CTO Manager will be held prior to initiating field work. Prior to the start of site work, TtEC's CTO Manager and PQCM will invite the RPM

to a mutual understanding meeting to discuss the contract quality control program requirements. The purpose of this meeting will be to develop a mutual understanding of the quality control details, including the work to be performed and the schedule. The forms to be used and the administration of on-site and off-site work will also be addressed. Minutes of the meeting will be prepared by the PQCM and signed by both the PQCM and the RPM or designated representative.

6.6.2 On-Site Quality Control Meetings

Progress meetings will be held with NAVFAC and BRAC Program Management Office on a regular basis to discuss progress and any necessary requirements to perform the work.

6.7 Submittals

The following documents will be prepared and submitted, as required by the contract.

- Contractor Production Report (daily during fieldwork)
- Contractor Quality Control Report (daily during fieldwork)
- Quality control certifications (daily during fieldwork on Contractor Quality Control Report)
- Submittal Register (monthly)
- Rework Items (monthly)

6.7.1 Contractor Production Report

The reporting of work will be identified by terminology consistent with the work schedule. Contractor Production Reports will be prepared, signed, and dated by the Site Superintendent. The report form is included in Appendix D. The Contractor Production Report will be completed daily and submitted to the RPM on the first workday following the date that the work covered by the report was performed. The report will include sufficient detail that reviewers can monitor the progress of the fieldwork.

6.7.2 Contractor Quality Control Report

A Contractor Quality Control Report is required for each day that work is performed. The report will provide an overview of quality control activities performed each day, including those relating to subcontractors and suppliers. It will document both conforming and nonconforming/deficient conditions, and will be precise, factual, legible, and objective. Copies of the supporting documentation, such as checklists and surveillance reports, will be attached. The report will contain the following information:

- The control phase and definable feature of work
- Results of preparatory phase meetings, including the location of the definable feature of work and a list of personnel present at the meeting (Confirm in the report that the drawings and specifications have been reviewed, the submittals have been approved, the materials comply with approved submittals and are stored properly, the preliminary work was done correctly, and the work methods and schedule have been discussed.)

- Results of initial phase meetings, including the location of the definable feature of work and a list of personnel present at the meeting (Confirm in the report for this definable feature of work that the preliminary work was done correctly, the workmanship is satisfactory, the test results are acceptable, the work is in compliance with the contract, and the required testing has been performed, including a list of who performed the tests.)
- Results of follow-up phase inspections, including the location of the definable feature of work (Confirm in the report for this definable feature of work that the work complies with the contract as approved in the initial phase, and that the required testing has been performed, including a list of who performed the tests.)
- A list of rework items identified, but not corrected by the close of business
- A revised rework items list as rework items are completed, along with the corrective action taken
- A "Remarks" section containing pertinent information such as directions received, problem areas, deviations from the approved plans, construction deficiencies encountered, quality control meetings held, corrective direction given by the PQCM, and corrective actions taken
- Contractor Quality Control Report certification (Section 6.7.3).

6.7.3 QC Certifications

Each Contractor Quality Control Report will contain the following statement signed by the PQCM:

"On behalf of the Contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period are in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report."

6.7.4 Submittal Register

Submittals will be as listed in the Submittal Register included in Appendix D.

6.8 Field QC Logbook

The PQCM will maintain a logbook to document quality control activities. The information in the logbook is intended to serve as a phone log and memory aide in the preparation of the Contractor Quality Control Report and in addressing follow-up questions that may arise.

6.9 Project Files

Project files will be maintained in the TtEC office in Langhorne, Pennsylvania. The PQCM is responsible for ensuring that all quality control documentation is incorporated into the Langhorne files in a timely manner. Copies of documents necessary to conduct the fieldwork will be maintained on-site, including but not limited to Field Change Requests (FCRs), FCR log, and the Rework Items List. These documents will be transferred to the project files upon completion of the work.

7.0 REMEDIAL ACTION COMPLETION REPORT

Upon completion of all field activities, TtEC will prepare a RACR documenting all site activities in accordance with Department of the Navy Guidance to Documenting Milestones Throughout the Site Closeout Process (March, 2006). The RACR will contain all of the requirements of the Project Construction Completion Report (CCR) following the Remedial Action Report format in accordance with Closeout Procedures for National Priorities Sites (USEPA 5409-R-98-016). The RACR will also meet the requirements of New Jersey Administrative Code (NJAC) 7:26E. The report will be summarize the procedures used to perform the work, explanation of any deviations from the RAWP, and will include text, tables (including a summary of confirmation sampling results to show applicable NJDEP soil criteria have been met, or where they remain exceeded) , photos, and figures to present the results of the project. The report will include the volumes of material removed, imported soil, as well as the analytical reports for all sampling and analyses, and disposal documentation. The RACR will include a discussion of any additional remedial actions that will be required, such as inclusion of engineering controls or amending the existing deed notice. All daily reports from field activities, a description of each project task, any problems encountered along with corrective measures, and as-built drawings will be submitted with the RACR.

TtEC will submit an internal draft completion report to the Navy for review and comment within 60 days of the completion of activities. Upon receiving Navy comments, TtEC will address all comments and prepare a draft and a final report for regulatory review, addressing regulatory comments between each report.

8.0 REFERENCES

Department of the Navy, 2006. *Guidance to Documenting Milestones throughout the Site Closeout Process*. March.

Foster Wheeler Environmental Corporation, 2001. *Remedial Action Completion Report Former NAWC Trenton, Trenton, New Jersey.*

New Jersey Association of Conservation Districts (NJACD), 2014. *Standards for Soil Erosion and Sediment Control*

TtEC, 2014. *Final Engineering Evaluation/Cost Analysis (EE/CA), Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey*. December

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TtNUS, 2013. *Technical Memorandum Report of Results for the West Ditch Groundwater Infiltration Investigation Former NAWC Trenton, Trenton, New Jersey.* May.

RGH, (Rogers, Golden, and Halpern), 1986. *Initial Assessment Study: Naval Air Propulsion Center, Trenton, New Jersey*. RGH, Philadelphia, and BCM Eastern, Inc. Plymouth Meeting, Pennsylvania. Environmental Restoration Department, Naval Energy and Environmental Support Activity, Port Hueneme, California.

U.S. Environmental Protection Agency, 1993. *Guidance on Conducting Non-Time Critical Removal Actions under CERCLA,* Office of Solid Waste and Emergency Response, Directive 9360.0-32. USEPA 540-F-94-009.

FIGURES

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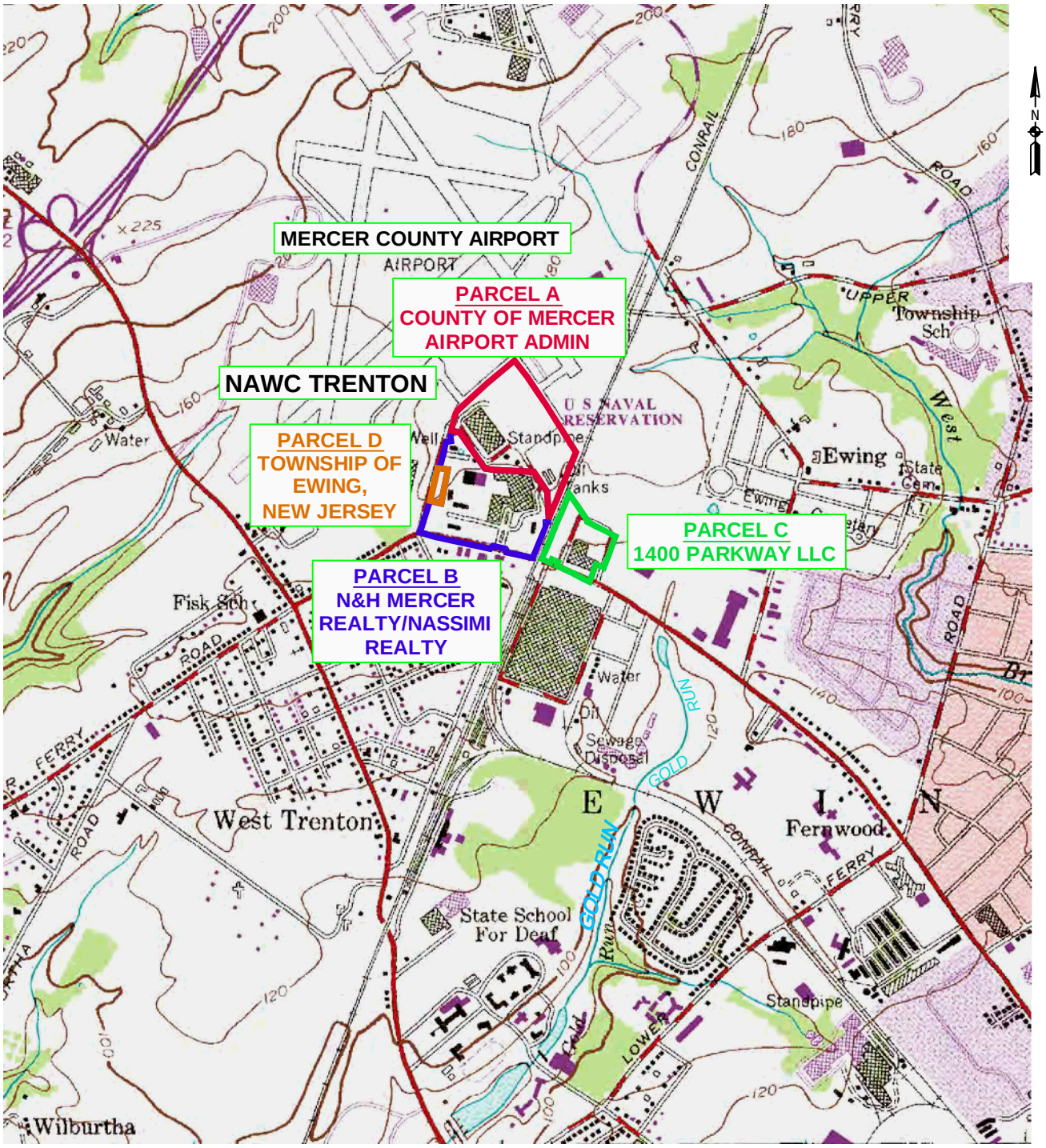

QUADRANGLE LOCATION

SOURCE:
BASE MAP IS A PORTION OF THE PENNINGTON, NJ U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 19543, PHOTOREVISED IN 1981.

0 1,600 3,200

SCALE IN FEET

FIGURE 1

FACILITY LOCATION MAP

NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION:
AUTHOR: A.CRABTREE
PROJECT NO:
FILE: SEE BELOW

TETRA TECH EC, INC.

P:\CAD Project Files\Trenton CAD Files\DWG Files\FIGURE 1 SAP.DWG 10/4/13

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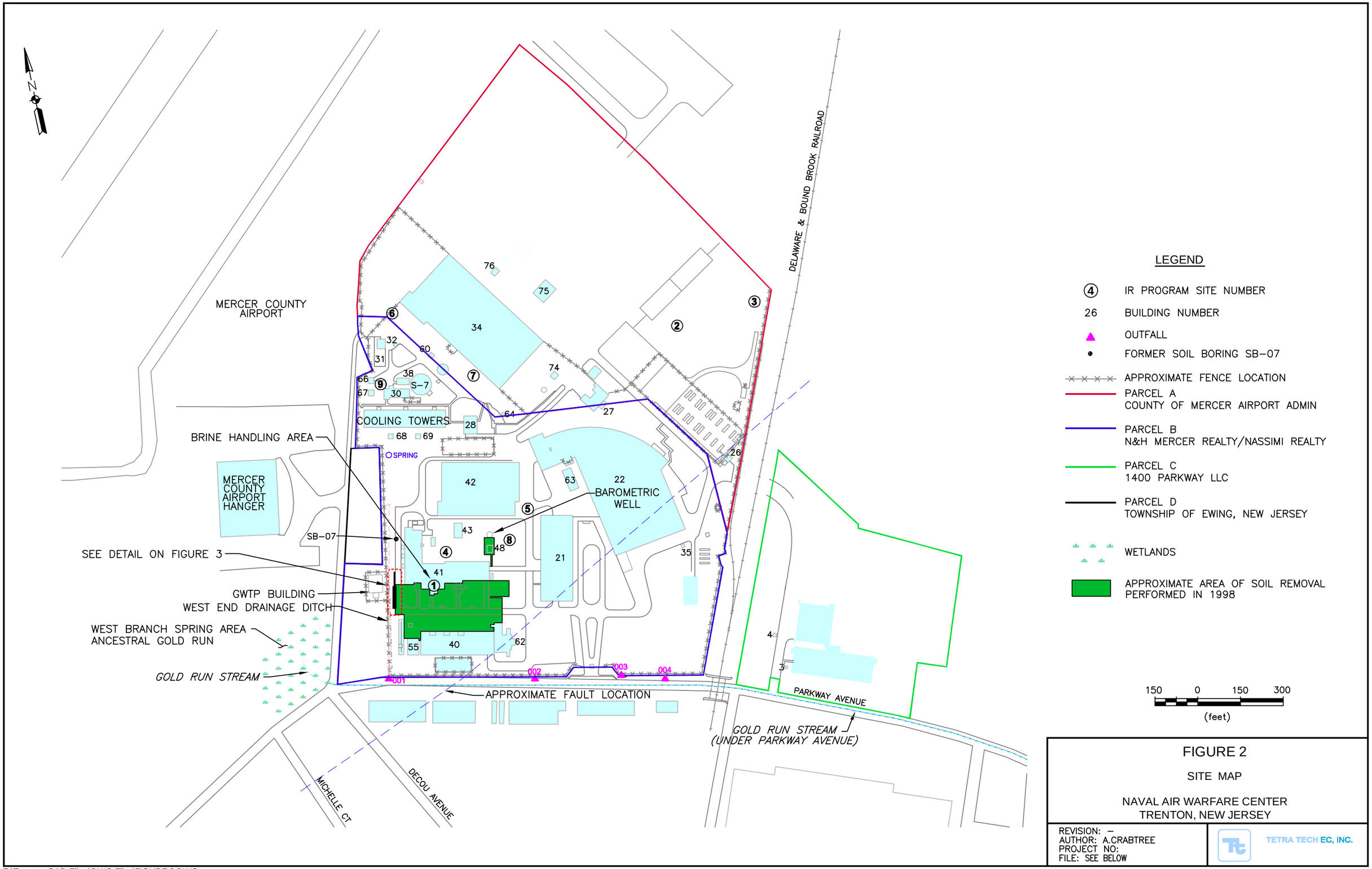

FIGURE 2

SITE MAP

NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: –
AUTHOR: A.CRABTREE
PROJECT NO:
FILE: SEE BELOW

TETRA TECH EC, INC.

F:\Trenton CAD Files\DWG Files\FIGURE 2.DWG

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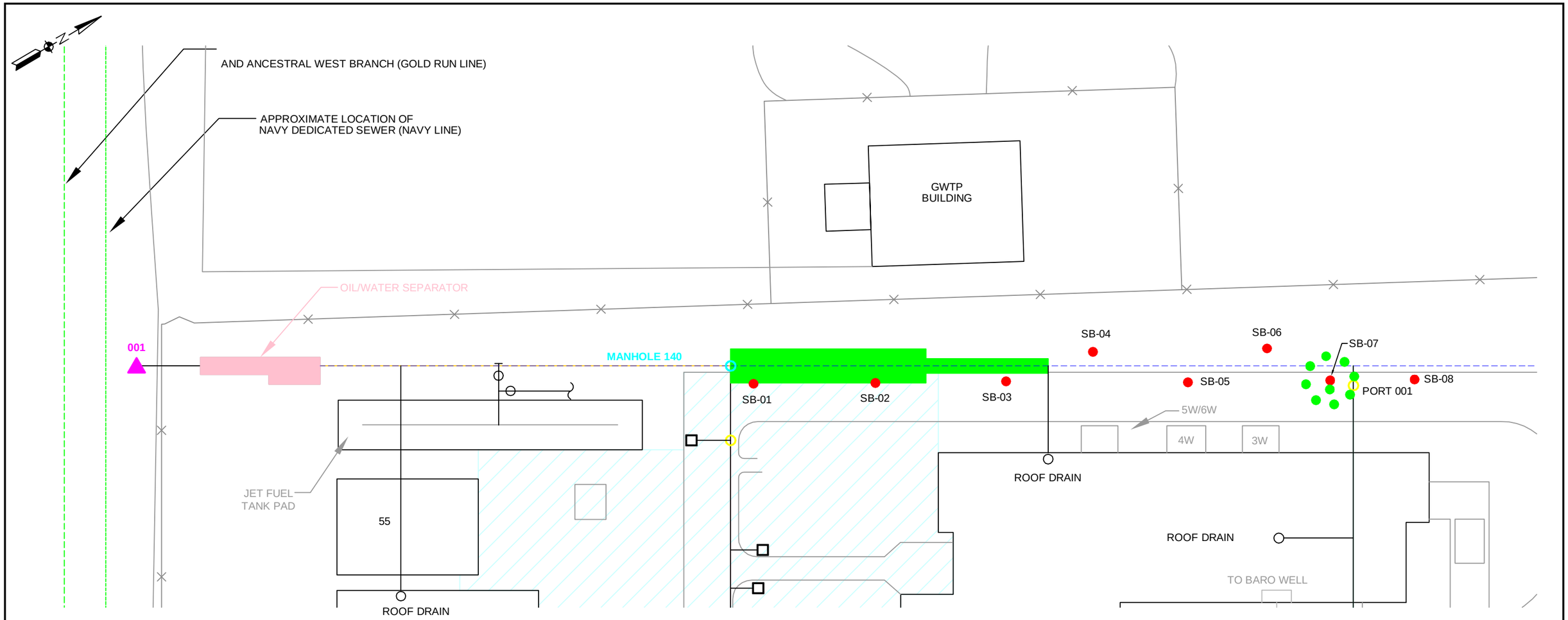


LEGEND

- OUTFALL
- 34 BUILDING NUMBER
- FORMER SOIL BORINGS – 2012
- PROPOSED DELINEATION BORINGS
- MANHOLE
- STORM SEWER CATCH BASIN
- STORM SEWER LINE
- 36" CMP STORM SEWER LINE
- PROPOSED WEST END DRAINAGE DITCH EXCAVATION
- APPROXIMATE AREA OF SOIL REMOVAL PERFORMED IN 1998

20 0 20 40
(feet)

FIGURE 3

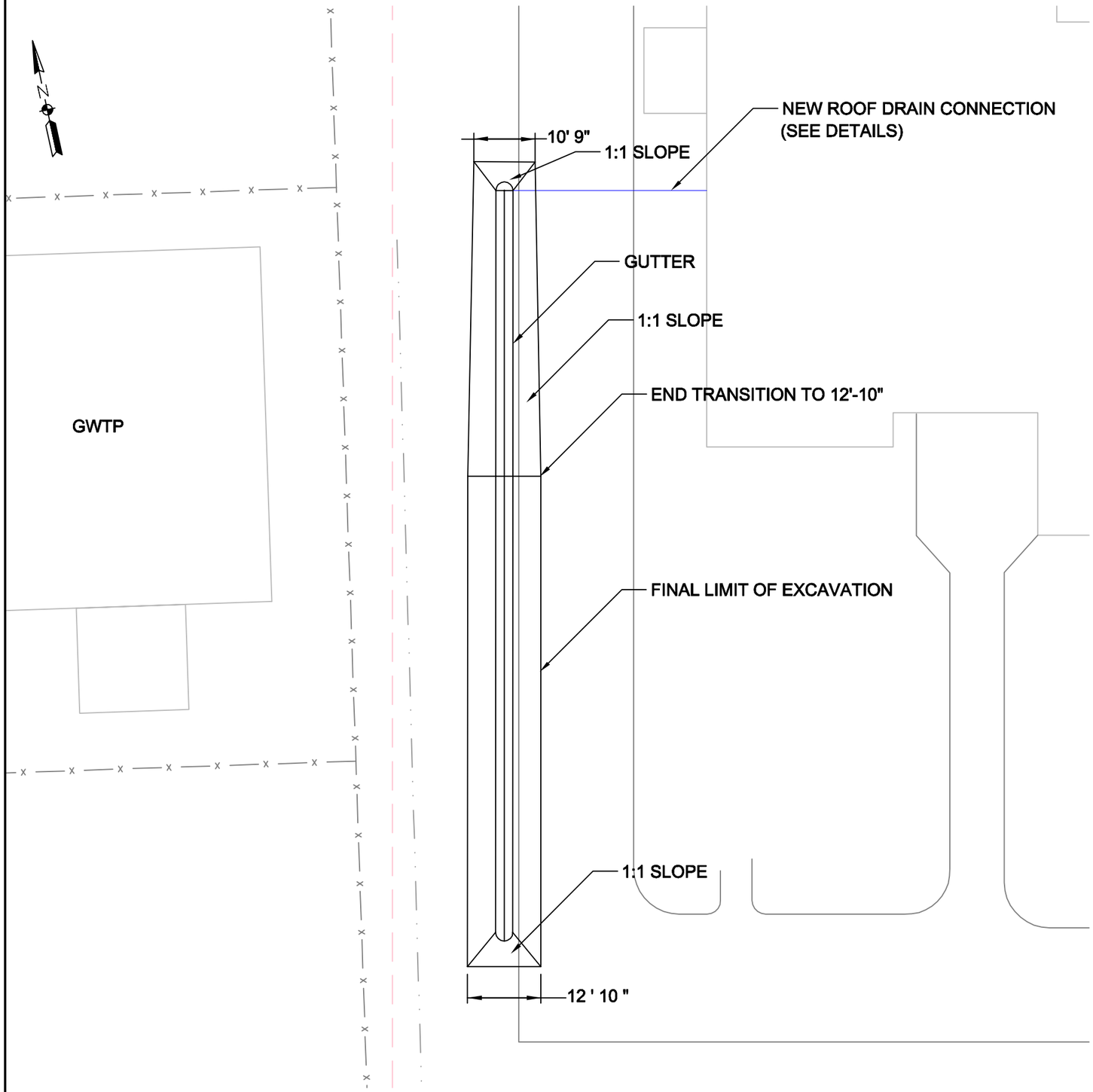
PROPOSED AREAS OF EXCAVATION

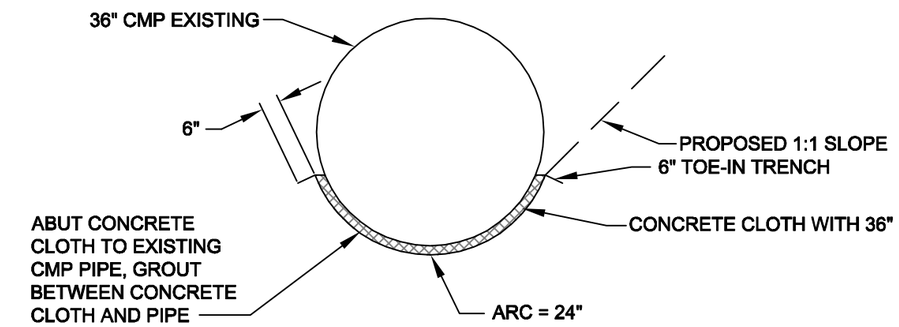
NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: –
AUTHOR: A.CRABTREE
PROJECT NO:
FILE: SEE BELOW

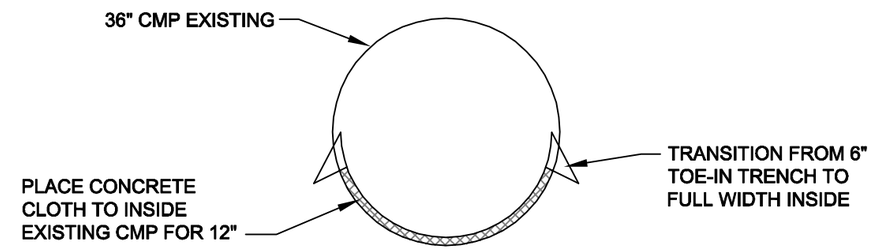
TETRA TECH EC, INC.

F:\Trenton CAD Files\DWG Files\FIGURE 3.dwg





NORTH END DITCH DETAIL
NTS



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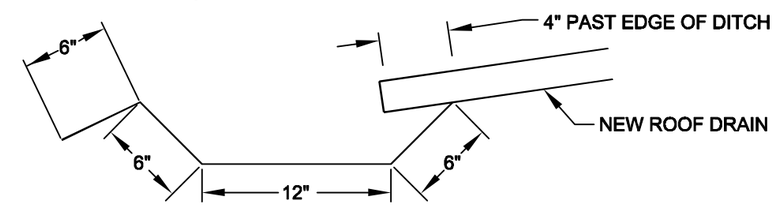
NTS



ROOF DRAIN DETAIL
NTS

LEGEND

—— x —— APPROXIMATE FENCE LOCATION

0 10 20 30
(feet)

FIGURE 4

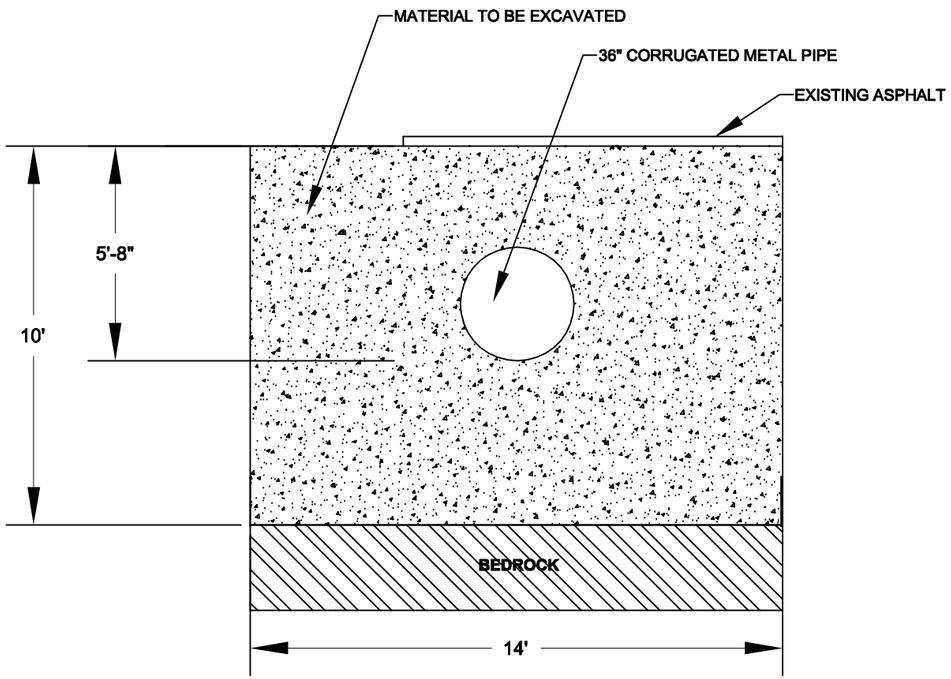
WEST END DRAINAGE DITCH REPLACEMENT MAP

NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

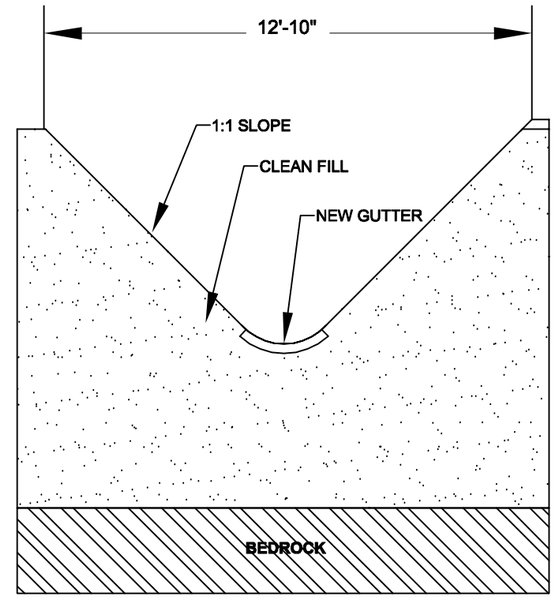
REVISION: –
AUTHOR: R. CLAYDON
PROJECT NO: 106–4659
FILE: SEE BELOW

TETRA TECH EC, INC.

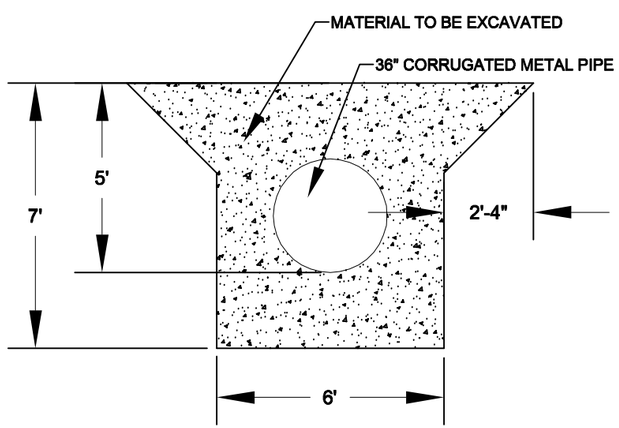
F:\Trenton CAD Files\DWG Files\Richard\FIGURE 4.dwg



EXCAVATION #1



RESTORATION #1



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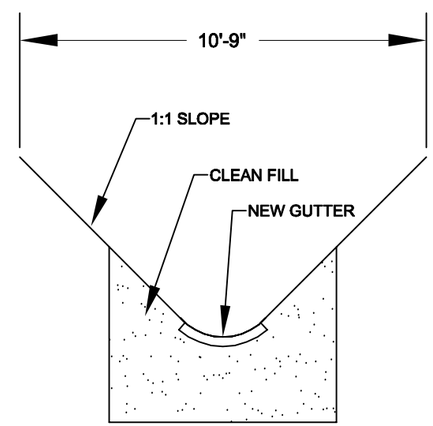


RESTORATION #2

SCALE 1" = 4'

FIGURE 5

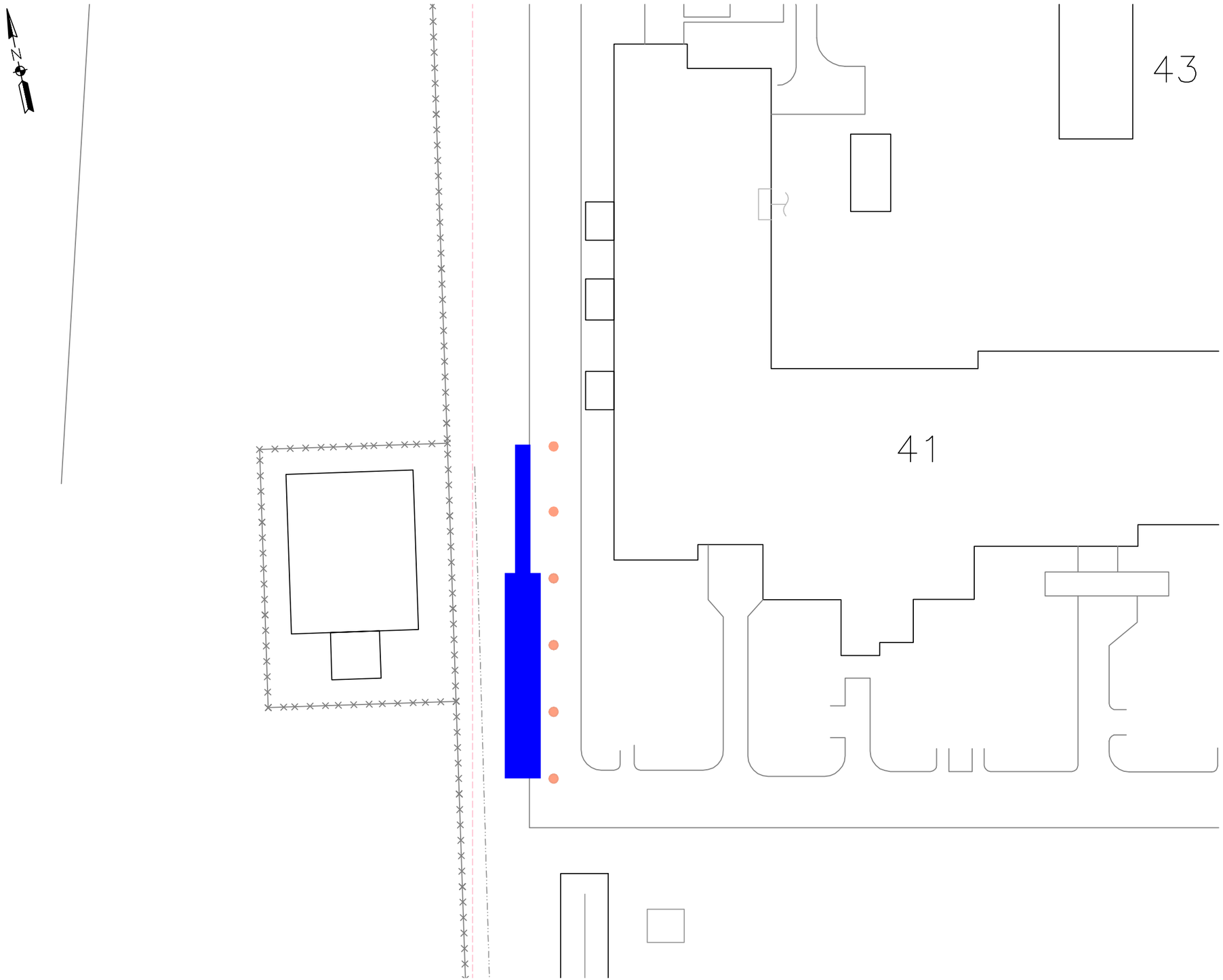
WEST END DRAINAGE DITCH EXCAVATION DETAILS

NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: A
AUTHOR: R. CLAYDON
PROJECT NO: 106-4659
FILE: SEE BELOW

TETRA TECH EC, INC.

F:\Trenton CAD Files\DWG Files\Richard\FIGURE 5.dwg



LEGEND

PROPOSED MONITORING WELL LOCATION

APPROXIMATE FENCE LOCATION

0 20 40 60

(feet)

FIGURE 6

MONITORING WELL LOCATION MAP

NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: –
AUTHOR: R. CLAYDON
PROJECT NO: 106–4659
FILE: SEE BELOW

TETRA TECH EC, INC.

F:\Trenton CAD Files\DWG Files\Richard\FIGURE 6-BACKUP.dwg

APPENDIX A

SAMPLING AND ANALYSIS PLAN

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Title and Approval Page
(Worksheet #1)

APPENDIX A

FINAL

TIER II SAMPLING AND ANALYSIS PLAN

December 2015

SITE 1 NON-TIME CRITICAL REMOVAL ACTION
FORMER NAVAL AIR WARFARE CENTER TRENTON
EWING TOWNSHIP, NEW JERSEY

Prepared for:
Department of the Navy
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Avenue
Norfolk, VA 23511-3095

and

Base Realignment and Closure
Program Management Office, Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Prepared by:
Tetra Tech EC, Inc.
5250 Challedon Drive
Virginia Beach, VA 23462

Prepared under:
Contract No. N62470-13-D-8007
DCN: 4659-WE11-15-0487
CTO No.WE11

Review Signature: Gregory D Joyce _____ December 1, 2015
Greg Joyce — Date
TtEC Quality Control Program Manager

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EXECUTIVE SUMMARY

Tetra Tech EC, Inc. (TtEC) has prepared this Sampling and Analysis Plan (SAP) to provide guidance on sampling, analysis, and quality control (QC) in support of a non-time critical removal action (NTCRA) to address the source of contamination at Installation Restoration (IR) Site 1 at former Naval Air Warfare Center (NAWC) Trenton located in Ewing Township, New Jersey (the Site) for the United States (U.S.) Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic under a Remedial Action Contract, N62470-13-D-8007, Contract Task Order (CTO) WE11.

This Tier II SAP, which is Appendix A of the Remedial Action Work Plan (RAWP), has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) Uniform Federal Policy for Quality Assurance Project Plans (EPA 2005) and Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS (EPA 2006) to ensure that all data collected are precise, accurate, representative, complete, and comparable to meet their intended use.

BACKGROUND AND SCOPE

This NTCRA is being conducted to mitigate the infiltration of groundwater contaminated with volatile organic compounds (VOCs) into the storm sewer system, which subsequently discharges to surface water. The NTCRA will remove contaminant mass that is acting as a contaminant source for the groundwater as well as remove a portion of a broken pipe that was allowing contaminated groundwater to infiltrate the sewer. This NTCRA does not interfere with the existing groundwater treatment plant (GWTP) that is currently operational at the facility.

This failed storm sewer pipe and contaminated soil are immediately adjacent to the western limit of a previous remedial action (Foster Wheeler 2001). This failed storm sewer pipe and contaminated soil were identified during the Navy's response to a New Jersey Department of Environmental Protection (NJDEP) letter dated May 24, 2010. The letter identified the Navy's need to further evaluate and mitigate the infiltration of contaminated groundwater into storm sewer system at NAWC Trenton. In support of the Navy's response, Tetra Tech NUS (TtNUS) conducted a video inspection of the storm sewer pipe; and confirmed it had failed, thus allowing groundwater to infiltrate to pipe. Soil sampling and laboratory analysis conducted beneath the storm sewer pipe identified soil contaminated with trichloroethylene (TCE) that could provide a continuing source of contamination to ground and surface water (TtNUS 2013). TtNUS documented the findings of this investigation in the Interim Report of Results for the West Ditch Groundwater Infiltration Investigation - Video Inspection and Soil Boring Program Northern Segment of the West Ditch Storm Sewer in May 2013. Based on this information, the Navy determined that a Remedial Action was necessary.

The NTCRA, as described in this RAWP, is being conducted under the stream-lined Engineering Evaluation/ Cost Analysis (EE/CA) Removal Action approach, while groundwater at the facility has been addressed under the Remedial Action process.

REGULATORY OVERSIGHT

Environmental investigation and remediation activities are being conducted at NAWC Trenton under the Department of Defense IR Program in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan NCP. Under Executive Order 12580, the Navy is the lead agency responsible for implementation of the IR Program and the site investigation and remediation. Navy oversight is provided by NJDEP.

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ATTACHMENTS

Attachment A Laboratory DoD ELAP Accreditation

ABBREVIATIONS AND ACRONYMS

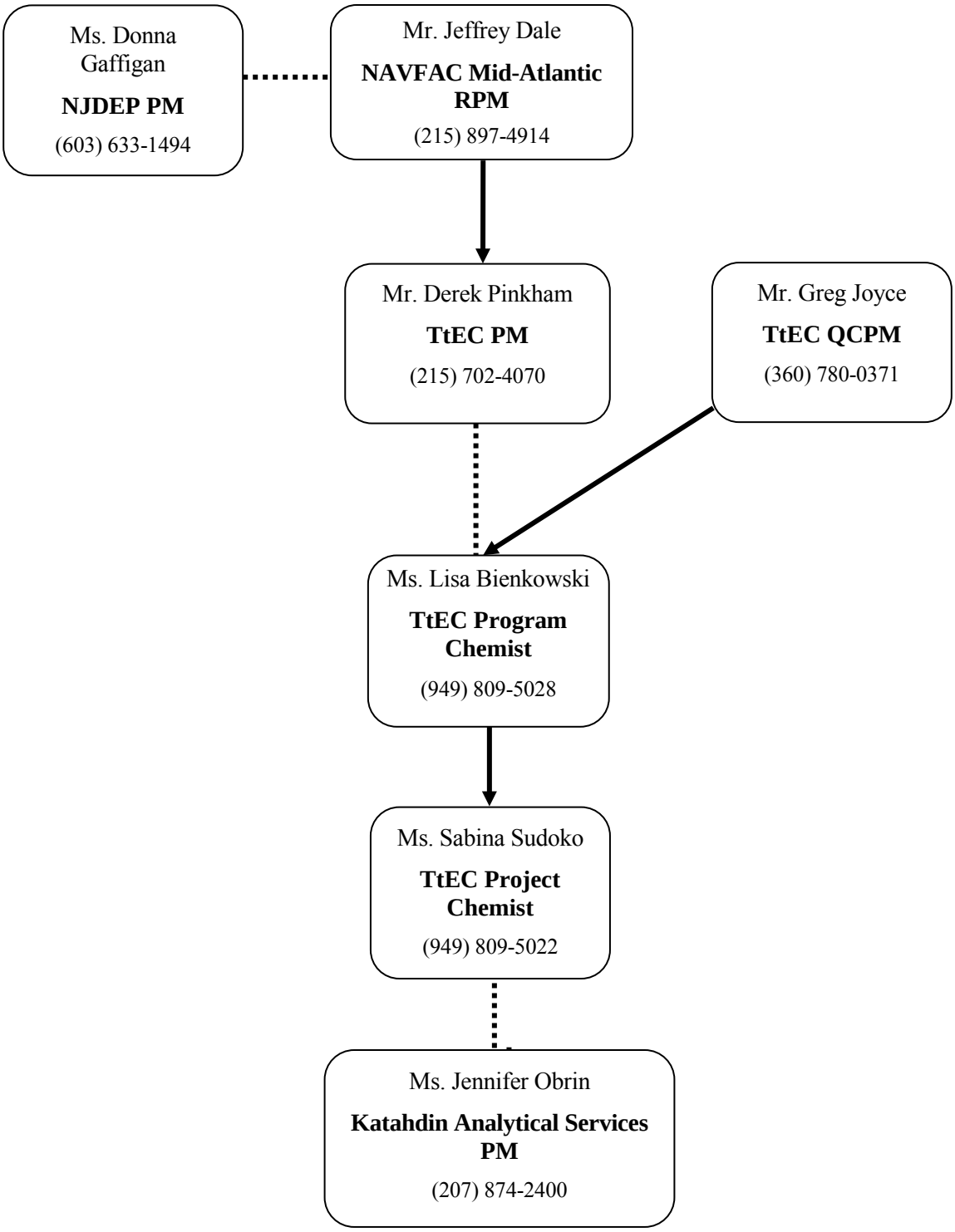
°C	degrees Celsius
AES	atomic emission spectrometer
bgs	below ground surface
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMP	corrugated metal pipe
COC	chain-of-custody
CTO	contract task order
DCN	Document Control Number
DL	detection limit
DoD	Department of Defense
EDD	electronic data deliverable
EE/CA	Engineering Evaluation/Cost Analysis
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
GMC	General Motors Corporation
GWTP	groundwater treatment plant
ICP	inductively coupled plasma
IR	installation restoration
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
ml	milliliter
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
NAVFAC	Naval Facilities Engineering Command

ABBREVIATIONS AND ACRONYMS
(Continued)

NAWC	Naval Air Warfare Center
Navy	Department of the Navy
NEDD	Navy Electronic Data Deliverable
NJDEP	New Jersey Department of Environmental Protection
NTCRA	non-time critical removal action
PCB	polychlorinated biphenyl
PDF	portable data format
PID	photoionization detector
PM	Project Manager
PQCM	Project Quality Control Manager
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QCPM	Quality Control Program Manager
QSM	Quality Systems Manual
RAWP	Remedial Action Work Plan
RGH	Rogers, Golden, and Halper
RI	remedial investigation
RPD	relative percent difference
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SDG	sample delivery group
SOP	Standard Operating Procedure
SVOC	semivolatile organic compound
SWQS	Surface Water Quality Standards
TCE	trichloroethene
TtEC	Tetra Tech EC, Inc.
TtNUS	Tetra Tech NUS
UFP	Uniform Federal Policy
VOC	volatile organic compound

Project Organizational Chart
(Worksheet #5)

Lines of Authority ——— ····· Lines of Communication



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Communication Pathways
(Worksheet #6)

Communication Drivers	Responsible Affiliation	Name	Phone Number	Procedure
Point of contact for contractor quality issues	TtEC QCPM	Mr. Greg Joyce	(360) 780-0371	The QCPM is responsible for overseeing program QC, including construction and analytical data acquisition. The QCPM has the authority to suspend project activities if quality standards are not maintained.
Project management	TtEC PM	Mr. Derek Pinkham	(215) 702-4070	If changes are necessary, the PM is responsible for communicating the changes via phone and/or e-mail to the project staff and is authorized to stop work, if necessary.
Point of contact for significant changes or corrective actions	Navy RPM	Mr. Jeffrey Dale	(215) 897-4914	If significant changes or corrective actions occur during the project, the RPM will notify the regulatory agencies involved in this project.
SAP review	TtEC QCPM	Mr. Greg Joyce	(360) 780-0371	The SAP will be written by the TtEC Program Chemist and reviewed by the QCPM prior to submittal to the Navy for review.
Notification of nonusable analytical data	TtEC Program Chemist	Ms. Lisa Bienkowski	(949) 809-5028	If significant problems are identified by the laboratory or the project team that impact the usability of the data (i.e., the data are rejected or data quality objectives are not met), the Program Chemist will notify the TtEC PM.
Coordination of laboratory supplies for field sampling activities	TtEC Project Chemist	Ms. Sabina Sudoko	(949) 809-5022	The Project Chemist will contact the laboratory to provide all necessary sample containers and appropriate shipping materials (such as coolers and bubble wrap) to be delivered on-site prior to commencement of field sampling activities and throughout the course of the project.

Communication Pathways (Continued)

(Worksheet #6)

Communication Drivers	Responsible Affiliation	Name	Phone Number	Procedure
Reporting laboratory data quality issues or analytical corrective actions	Katahdin PM	Ms. Jennifer Obrin	(207) 874-2400	All laboratory data quality issues will be reported in writing to the TtEC Project Chemist within 24 hours by the laboratory PM. Any corrective actions will be documented and verified by the TtEC Project Chemist.
Release of analytical data	TtEC Project Chemist	Ms. Sabina Sudoko	(949) 809-5022	The Project Chemist will review analytical results to verify that the requirements in this SAP have been met prior to releasing the data to the project team for evaluation.
SAP procedure revision during field activities	TtEC Program Chemist	Ms. Lisa Bienkowski	(949) 809-5028	The Program Chemist (or designee) will prepare a Field Change Request for any changes in sampling procedures that occur due to conditions in the field.
SAP amendments	TtEC Program Chemist	Ms. Lisa Bienkowski	(949) 809-5028	Significant changes to the SAP such as additional scope of work that is not covered in this SAP will require that the Program Chemist prepare an addendum to this SAP, which will be reviewed by the Navy prior to initiating the affected field activities.

Project Planning Session Participants Sheet
(Worksheet #9)

Project Name: Site 1 NTCRA **Projected Date(s) of Sampling:** 2015 **Project Manager:** Mr. Derek Pinkham	**Site Name:** Former NAWC Trenton **Site Location:** Ewing Township, New Jersey

Date of Session: February 12, 2015

Scoping Session Purpose: Meeting to discuss scope of project with Navy. The purpose of this meeting was to develop a mutual understanding of the work to be performed and the planning documents to be developed and submitted.

Name	Title	Affiliation	Phone #	E-mail Address
Mr. Jeffrey Dale	RPM	NAVFAC Mid-Atlantic	(215) 897-4914	jeffrey.dale@navy.mil
Mr. Derek Pinkham	PM	TtEC	(215) 702-4070	derek.pinkham@tetratech.com

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Conceptual Site Model
(Worksheet #10)

The former NAWC facility is located 5 miles northwest of Trenton, New Jersey in Ewing Township, Mercer County (Figure 1 of the RAWP). The facility, when owned and operated by the Navy, consisted of approximately 67 acres. NAWC Trenton can be found on the U.S. Geological Survey Pennington and Trenton West 7.5-minute topographic maps.

The Mercer County Airport borders most of the northern and western portions of the former NAWC Trenton property. An active rail line owned by CSX Transportation, Inc. borders the facility on the east and separates Parcel C (former Buildings 1 and 2) from the remainder of the facility. Parkway Avenue abuts the southern boundary of the NAWC Trenton property. Across Parkway Avenue and east of the railroad is where General Motors Corporation (GMC)-Delphi Interior formerly operated a manufacturing facility. East of the former GMC facility is Gold Run stream and three associated ponds which drain southwesterly to the Delaware River. South of Parkway Avenue and west of the railroad tracks are several small commercial facilities. Residential and light-industrial areas are located further south and southwest of the NAWC Trenton facility.

NAWC Trenton was commissioned in 1951 as the Naval Air Turbine Test Station. NAWC Trenton was primarily used as a testing facility for military aircraft engine performance under simulated high and low altitude conditions. Three large buildings (see Figure 2 of the RAWP) formerly comprised the experimental engine laboratory: the Blower Wing (Building 40), the Test Wing (Building 41), and the Exhauster Wing (Building 42). By the mid-1980s, construction of cruise missile-related test equipment became a priority at the facility. An on-site industrial wastewater treatment plant, three high-capacity water cooling towers, an automotive workshop, a machine shop, a woodworking shop, fuel and lubrication laboratories, a general chemistry laboratory, and various engineering and administrative offices were also located at the facility.

Industrial wastewaters from former site operations were diverted through a central piping system to a 52-feet deep gravity basin, located between Buildings 41 and 42, known as the Barometric Well (Figure 2 of the RAWP). The Navy decommissioned the Barometric Well in May 1998, at which time the concrete well vault was filled with gravel and capped with concrete, and the related piping was cut and sealed. Operational closure of NAWC Trenton occurred on December 15, 1998 under the Base Realignment and Closure Act of 1993. Several large buildings currently remain in place; however they were decommissioned and cleaned as necessary by the Navy as part of the 1998 closure activities and there are no active utility hookups between the various buildings that remain at the facility. Former macadam paved areas and driveways remain. Overgrown bushes and grasses are present in those areas that were formerly grass-covered. The building housing the GWTP equipment was added in 1995.

Conceptual Site Model (Continued)

(Worksheet #10)

Environmental investigations have been conducted by the Navy at NAWC Trenton since the mid-1980s. In 1986, Rogers, Golden, and Halpern (RGH) completed a preliminary investigation that identified seven areas (Sites 1 through 7) of potential concern and recommended further investigation (RGH, 1986). Site 1 is located in the southwest corner of the NAWC Trenton facility between Buildings 40 and 41 (the Blower Wing and Test Wing, respectively) and the West End Drainage Ditch (Figure 2 of the RAWP). From 1951 to 1957, liquid solvents and heat exchange fluids were used for various operations conducted in a rectangular-shaped area between Buildings 40 and 41, known as the Brine Handling Area and subsequently, drained into the West End Drainage Ditch. The Brine Handling Area measures approximately 150 feet by 300 feet and is a flat, vegetated covered area. The West End Drainage Ditch was a rectangular open swale approximately 25 feet wide and 400 feet long that collects surface water runoff from various portions of the facility including the Brine Handling Area.

In 1970, the Navy installed a corrugated metal storm sewer pipe and overlying backfill within a major portion of the open swale. Groundwater and soil sampling was conducted during the initial site inspection and the remedial investigation (RI) of Site 1. Based on the RI, it was determined that soil located within Site 1 exceeded NJDEP soil cleanup criteria for select VOCs, semi-volatile organic compounds (SVOCs), and inorganic compounds. Sampling results also indicated that groundwater beneath Site 1 might be contaminated from the various soil contaminants. In 1998, the Navy elected to excavate the most contaminated soil for Site 1, specifically between Buildings 40 and 41, and towards Building 48, from the existing ground surface to the top of bedrock or groundwater (approximately 6 to 8 feet below grade). Following backfilling, a vegetated soil cap was installed/established over the remaining areas of Site 1 to limit potential for direct contact.

A Reuse Plan for NAWC Trenton was approved on July 15, 1996 and property ownership was transferred by parcel between 1997 and 2001. The Navy has in place agreements and easements with each of the current property owners to allow for access to the site, including a number of capped impacted soil areas, groundwater monitoring and extraction wells, outfalls, associated piping, and the on-site GWTP building. A chain-link fence borders Site 1 on most sides; however a portion of Parcel A is owned and contained within the active Trenton-Mercer Airport and the fence was removed there and replaced with a new fence along the new southern boundary of the Airport property. The fence along the south and east side of the East campus has been removed. Future land use at Site 1 will consist of light industrial or commercial activities and residential use of Parcel C. As of 2015, no active development activities are occurring.

Conceptual Site Model (Continued)
(Worksheet #10)

In September 1998 a Decision Document was issued which established limits for TCE in soil. At the time, the Impact to Groundwater Cleanup Criteria was 1.0 ppm and the Non-Residential Soil Cleanup Criteria was 54 ppm.

The West End Drainage Ditch is an area that was contaminated by TCE releases to the land surface and transported via the storm sewer system (of storm sewer pipes and open ditches). TCE was used as a heat exchange fluid in air cooling systems at NAWC Trenton. The Navy has conducted numerous repairs and replacement of storm sewer pipe to mitigate infiltration of contaminated groundwater and transport off-site (TtNUS 2013). A volume of approximately 15,500 cubic yards of soil was excavated to bedrock (approximately 8 to 12 feet below land surface) in 1998 (Foster Wheeler 2001).

In 2012, a deteriorated section of pipe approximately 130 feet long and ending at manhole #140 was identified as failed. The failed pipe is a subset of a 300 foot section of pipe that drains north to south. The deteriorated pipe was confirmed by video inspection in 2012. TCE was detected in soil around and beneath the pipe at concentrations up to 10,000 micrograms per kilogram (µg/kg) in 2012 (TtNUS 2013). The soil and the failed corrugated metal pipe (CMP) are immediately west of the area excavated by Foster Wheeler in 1998. The most contaminated soil was identified immediately above bedrock at a depth of 9 to 10 feet below ground surface (bgs) (TtNUS 2013).

In May 2013, TtNUS issued an Interim Report of Results for the West Ditch Groundwater Infiltration Investigation - Video Inspection and Soil Boring Program Northern Segment of the West Ditch Storm Sewer, which described the following activities:

- Results of the video survey of the CMP, which was conducted to evaluate the overall condition of the pipe and to determine the location(s) where infiltration may be occurring.
- Analytical results of subsurface soil samples collected from immediately adjacent to the CMP to evaluate the quality of the fill and to determine to what extent they may be the source of the site-related VOCs infiltrating the CMP. A soil sample collected from SB-07 (11 to 12 feet bgs) also contained 10,000 µg/kg of TCE, which is above the NJDEP Impact to Groundwater Soil Cleanup Criteria of 0.01 parts per million (ppm), but below the Non-Residential Direct Contact Soil Remediation Standard of 20 ppm The depth to soil/bedrock interface varies throughout the site such that samples collected at SB-07 indicated the highest contamination adjacent to the CMP was slightly deeper (11 to 12 feet bgs) compared to the soil samples collected around and beneath the pipe (described above) at 9 to 10 feet bgs.

Conceptual Site Model (Continued)
(Worksheet #10)

- Analytical results waste characterization analysis (soil) to determine disposal options in the event that repairs to the CMP are required or that the Navy decides to excavate any West Ditch soils.

Removal Action Alternatives were developed and evaluated in the EE/CA for Site 1 (TtEC 2014). The alternatives included:

- Alternative 1 – No Action
- Alternative 2 – Soil Heating
- Alternative 3 – Soil Excavation and Off-Site Disposal

Removal Action Alternatives were analyzed for their effectiveness, implementability, and cost in accordance with EPA guidance, Conducting Non-Time-Critical Removal Actions under CERCLA (EPA 1993). After alternatives were individually assessed against the criteria, a comparative analysis was conducted to evaluate the relative performance of each alternative in relation to each of the criteria. A No Action alternative was evaluated as a baseline condition but is not acceptable for Site 1. Alternative 3 was selected as the alternative to be implemented. Alternative 3 is the least costly and is equally or more effective and implementable than Alternative 2.

Removal Action Objectives

The primary objective of the planned Removal Action (Alternative 3) is to reduce the amount of VOC-impacted soil that remains in the subsurface in order to prevent the discharge of groundwater with concentrations of VOCs above the Surface Water Quality Standards (SWQS) to Parkway Avenue storm sewers and ultimately to Gold Run. This will be accomplished by removing TCE-impacted soil at Site 1 (via excavation and disposal). The RAWP and SAP outline a NTCRA to remove TCE impacted soil from Site 1 and replace a damaged pipe with an open culvert.

Data Quality Objectives/Systematic Planning Process Statements
(Worksheet #11)

1. State the problem

The primary objective of the planned Removal Action (Alternative 3) is to reduce the amount of VOC-impacted soil that remains in the subsurface in order to prevent the discharge of groundwater with concentrations of VOCs above the SWQS to Parkway Avenue storm sewers and ultimately to Gold Run. This will be accomplished by removing TCE-impacted soil at Site 1 (via excavation and disposal).

2. Identify the goal of the study

a. Are the analytical results from the delineation soil samples in the SB-07 area below the project action limit for TCE listed in the Reference Limits and Evaluation Tables (Worksheet #15)?

b. Do the analytical results from the confirmation soil samples collected after excavation of the West End Drainage Ditch (and/or the SB-07 area) confirm that VOC-impacted soil has been removed i.e. the results are below the project action limits listed in the Reference Limits and Evaluation Tables (Worksheet #15)?

c. Are the analytical results for the backfill material below the project action limits listed in the Reference Limits and Evaluation Tables (Worksheet #15)?

3. Identify information inputs

The information input gathered during this project will be from the analytical results of the samples collected.

4. Define the boundaries of the study

Spatial boundaries: The facility location map, Site 1 map, and proposed areas of excavation map are contained in the RAWP as Figures 1, 2, and 3 of the RAWP. Depth of excavation is limited to approximately 8-12 feet below surface due to bedrock or groundwater.

Temporal boundaries: Not applicable to this project.

5. Develop the analytic approach

a. If the analytical results from the delineation soil samples in the SB-07 area are below the project action limit for TCE listed in the Reference Limits and Evaluation Tables (Worksheet #15), then excavation of the area will not be conducted. If any of the results are above the criteria, the area will be excavated and confirmation soil samples will be collected after excavation.

Data Quality Objectives/Systematic Planning Process Statements (Continued)
(Worksheet #11)

b. Since TtEC's scope for this project is to reduce VOC-impacted soil that is potentially contributing to groundwater contamination, once the West End Drainage Ditch and/or the SB-07 areas have been excavated and confirmation samples collected, the areas will be backfilled immediately. So, if the analytical results from the confirmation soil samples are below the project action limits, then this NTCRA will be considered successful and no further action will be required. If the results are above the criteria, then the results will be used to perform risk assessment by the Navy or another contractor.

c. If the analytical results for the backfill material are below the project action limits listed in the Reference Limits and Evaluation Tables (Worksheet #15), then the material may be used as backfill. Otherwise, another source will be identified and sampled.

6. Specify performance or acceptance criteria

Field crews will review the final version of this SAP prior to collection of samples. In addition, the laboratory will be provided the final version of this SAP to ensure that all specified requirements are met.

Analytical performance or acceptance criteria are specified in Reference Limits and Evaluation Tables (Worksheet #15) and in Laboratory QC Samples Table (Worksheet #28).

7. Develop the plan for obtaining data

Samples will be collected as described in Field Project Tasks (Worksheet #14) and analyzed for analyses listed in Sample Details Table (Worksheet #18, 19, 20, and 30).

Field Quality Control Samples
(Worksheet #12)

QC Sample	Analytical Group	Frequency	Data Quality Indicators	Measurement Performance Criteria
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	VOCs (delineation samples) VOCs, Metals (confirmation soil samples)	1 per 20 samples	Precision/ Accuracy	See criteria listed in Laboratory QC Samples Table (Worksheet #28)
Field Duplicate	VOCs (delineation samples) VOCs, Metals (confirmation soil samples)	1 per 20 samples	Precision	Relative percent difference (RPD) ≤ 50% when both original and field duplicate concentrations are detected above the limit of quantitation (LOQ)
Trip Blank (laboratory provided as two 40 ml vials with 5 mls deionized water and one 40 ml vial with 5 mls methanol)	VOCs (delineation samples) VOCs (confirmation soil samples)	1 per cooler with VOCs	Accuracy	No analytes detected above the LOQ

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Sampling Design and Rationale
(Worksheet #17)

The selected Removal Action Alternative (Alternative 3) consists of the following elements:

- Removal and off-site disposal of approximately 660 yards of impacted soil from the West- end Drainage Ditch
- Removal and disposal of failed drainage pipe
- Replace the removed drainage pipe with an open drainage ditch and construct headwalls to tie into the existing storm drainage system.

In addition to the work described in Alternative 3 above, an additional area of soil to the north of the excavation of the West End Drainage Ditch will be delineated and potentially excavated (soil will be disposed offsite). This area is represented by soil boring SB-07 (as indicated on Figure 3 of the RAWP) where a soil sample result from this soil boring, collected in August 2012 as part of the West Ditch Infiltration Investigation, contained 10,000 µg/kg of TCE, which is above the NJDEP Impact to Groundwater Soil Cleanup Criteria of 0.01 ppm, but below the Non-Residential Direct Contact Soil Remediation Standard of 20 ppm. Soil sample SB-07-1112-02 was collected from a depth of 11 to 12 feet bgs (bedrock was encountered at a depth of 20 feet bgs). As the soil sample was taken at a depth that is below the water table when nearby extraction wells MW-08BR and MW-29BR were not operating, the NJDEP Direct Contact Criteria should be applicable in this case. TtEC estimates that an approximately 40 foot by 40 foot area to a depth of 20 feet may be excavated, characterized, and disposed offsite (1,800 tons) pending evaluation of delineation investigation sampling results discussed below. This soil may be removed to eliminate a potential source of groundwater contamination or vapor intrusion prior to redevelopment.

SOIL PRE-CLASSIFICATION AND DELINEATION INVESTIGATION

Prior to beginning the excavation activities, TtEC will conduct a soil pre-classification investigation at both Site 1 West End Drainage Ditch north of MH-140 and also at the area around former soil boring SB-07 excavations by advancing soil borings via a hollow stem auger drill rig. It is expected that soil borings will be completed to bedrock and that samples will be collected throughout the length of the boring. The purpose of this investigation is to determine the disposal options for the soil to be excavated and obtain disposal facility approval prior to beginning excavation. This will allow for direct load of soil into trucks without having to stockpile the soil on-site. The analytical parameters and number of soil pre-classification samples will be established by the disposal facility, which has not been chosen yet, but it is expected that

Sampling Design and Rationale (Continued)
(Worksheet #17)

the samples will be analyzed for VOCs and metals, at a minimum. Since this sampling is for waste characterization and disposal purposes only, details on sampling and analysis are discussed in the RAWP and not in this SAP.

In addition, a delineation investigation will be performed in the area of soil boring SB-07 where 9 soil borings (illustrated in Figure 3 of the RAWP) will be advanced to bedrock to delineate the vertical and horizontal extent of the northern removal area. A hollow stem auger drill will also be used to advance these soil borings. Two discrete soil samples will be collected from each of these borings, and the sampling interval is expected to be from the 9 to 10 foot interval and the 11 to 12 foot interval. Sample intervals will be biased to elevated photoionization detector (PID) levels (10 ppm or higher). These samples will be analyzed for TCE only.

CONFIRMATION SOIL SAMPLING

Once the excavations have been completed, confirmatory soil samples will be collected from the base of the sidewalls of the excavation or at the zone that is zero to six inches above the water table. Sample frequency will be approximately one sample for every 15 feet of sidewall. This frequency equates to approximately 40 confirmatory samples collected from the Site 1 West End Drainage Ditch and 20 confirmatory samples collected from the excavation area around soil boring SB-07.

The sampling protocol is designed to determine the level of soil contamination remaining in the subsurface. These confirmatory soil samples will be analyzed for VOCs and metals only. Excavations will be backfilled before confirmatory sample results are obtained from the laboratory (the new stormwater drainage will also be installed prior to receipt of confirmatory sample results). All sample locations will be documented within a sample logbook, and located on a site map.

BACKFILL SOIL SAMPLING

If backfill soil material like topsoil or common fill is required for this site, one five-point composite sample of each soil backfill material will be collected. This sample will be analyzed for VOCs, SVOCs, pesticides, polychlorinated biphenyls (PCBs), metals, and cyanide. A discrete sample will be collected at the first of the 5 locations for VOC analysis since VOC samples should not be composited.

Field Project Tasks
(Worksheet #14)

SCOPE OF WORK

- Mobilization
- Land Surveying
- Soil Pre-Classification and Delineation Investigations
- Erosion and Sediment Control
- Excavation, Transportation, and Disposal of Soil
- Confirmation Soil Sampling
- New Culvert Installation
- Site Restoration
- Close-Out Report

Sampling and data management procedures are described below.

SOIL SAMPLING PROCEDURES

Prior to collecting delineation soil samples around SB-07 and confirmation soil samples post-excavation, TtEC will oversee a surveyor to locate all of the sampling locations. One discrete soil sample will be collected from each location at the depths described in Sampling Design and Rationale (Worksheet #17). Each sample will be collected using a disposable 5 gram syringe (like a Terra Core™) to collect 5 grams aliquots into three 40 milliliter (ml) vials: two vials will have 5 mls of deionized water each and one will have 5 mls of methanol. In addition, a two ounce glass jar will be collected and filled completely for percent moisture analysis (for delineation samples) and a 4 ounce glass jar for percent moisture and metals (for confirmation samples).

Any soil such as topsoil or common fill material to be used as backfill (from an off-site source or from material excavated from the site) will be sampled. One five-point composite soil sample (per source) will be collected. At the first of five locations, vials will be collected as described above for the VOC sample since VOCs should not be composited. Then, an aliquot from each of the five locations will be placed into four eight ounce jars that will be filled completely for additional analyses.

SAMPLE CUSTODY PROCEDURES

An overriding consideration for data resulting from laboratory analyses is the ability to demonstrate that the data are legally defensible, i.e., that the samples were obtained from the locations stated and that they reached the laboratory without alteration. To accomplish this, evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal will be

Field Project Tasks (Continued)
(Worksheet #14)

documented through the chain-of-custody (COC) record. A sample is considered to be in custody if the following conditions have been observed:

- In actual possession or in view of the person who collected the samples
- Locked in a secure area
- Placed in an area restricted to authorized personnel
- Placed in a container and secured with an official seal, so that the sample cannot be reached without breaking the seal

The COC record lists each sample and the individuals performing the sample collection, shipment, and receipt. The COC record will be the controlling document to ensure that the sample custody is maintained. Each time the sample custody is transferred, the former custodian will sign the COC on the _Relinquished By_ line, and the new custodian will sign the COC on the _Received By_ line. The date, time, and project or company affiliation will accompany each signature. When FedEx is used to ship samples to the laboratory, the waybill number and "FedEx" will be recorded on the COC. The shipping container will be secured with two custody seals, thereby allowing for custody to be maintained by the shipping personnel until receipt by the laboratory.

Sample custody will be the responsibility of sampling personnel from the time of sample collection until the samples are accepted by the laboratory. Thereafter, the laboratory performing the analysis will maintain custody. The laboratory sample custodian will sign the COC, inventory each shipment, and note any discrepancies in the sample custody, temperature of the cooler for chemical samples, or broken sample containers. The laboratory will notify the Project Chemist of any discrepancies. The laboratory will have a system for tracking samples consistent with the requirements in the Quality Systems Manual (QSM) (DoD 2010). Samples submitted for analysis shall be held for up to 90 calendar days after sample collection, at which time the samples will be disposed of by the laboratory.

In addition to providing a custody exchange record for the samples, the COC record serves as a formal request for sample analyses. The COC records will be completed, signed, and distributed as follows:

- The original copy sent to the laboratory along with the samples
- A copy retained on-site for inclusion in the project files
- A copy faxed/emailed to the Project Chemist on a daily basis to allow tracking of samples sent to the laboratory to confirm laboratory receipt of samples

SAMPLE LABELS AND NUMBERING PROCEDURES

Field Project Tasks (Continued)
(Worksheet #14)

Sample labels will be filled out in indelible black or blue ink and affixed to sample containers at the time of sample collection. Each sample label will be covered with clear tape to ensure written information is not made illegible. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock) from the start of sampling
- Sampler's initials
- Preservative (if any)

Samples sent for laboratory analysis will be uniquely designated using a numbering system such as the following:

- Delineation samples at SB-07, SITE1-SB-07-XX where:

  SITE1 – abbreviation for Site 1

  SB-07 – identifier to indicate SB-07 area

  XX – consecutive sample number starting with 01

- Sidewall confirmation samples at West End Drainage Ditch, SITE1-SW-XX where:

  SITE1 – abbreviation for Site 1

  SW – identifier to indicate sidewall sample

  XX – consecutive sample number starting with 01

- Sidewall confirmation samples at SB-07, SITE1-SB-07-SW-XX where:

  SITE1 – abbreviation for Site 1

  SB-07 – identifier to indicate SB-07 area

  SW – identifier to indicate sidewall sample

  XX – consecutive sample number starting with 01

- Backfill samples, SITE1-BCK-XX where:

  SITE1 – abbreviation for Site 1

  BCK – identifier to indicate backfill sample

  XX – consecutive sample number starting with 01

Field Project Tasks (Continued)
(Worksheet #14)

For field duplicate samples, a designator "-FD" will be used after the consecutive sample number that represents the location a field duplicate is collected from (example SITE1-SW-01FD). MS/MSD samples will be indicated on the COC in the laboratory notes section.

The sample identification number will be recorded in the field logbook, on the labels, and the COC record at the time of sample collection. A complete description of the sample and sampling conditions will be recorded in the field logbook and referenced using the unique sample identification number.

SAMPLE PACKAGING PROCEDURES

For samples submitted to the laboratory, containers will be placed in double-resealable plastic bags to protect the samples from moisture. The samples will be placed in coolers, and each cooler will contain a temperature blank. (A temperature blank is a laboratory-provided container filled with tap water and stored in the cooler during sample collection and transportation.) The temperature of the cooler will be recorded by the laboratory immediately upon receipt of the samples by using the temperature blank. Wet ice (not blue ice) will be added to the cooler to ensure that samples are surrounded by ice. Two custody seals will then be affixed to the cooler after packaging. If samples are shipped via commercial courier like FedEx, then additional packaging procedures will include:

- Wrapping glass containers in bubble wrap after placing in double resealable bags to protect from breakage;
- Taping the cooler drain spouts on the inside and outside of the cooler to prevent leakage during transport;
- Lining the cooler with a plastic bag, then placing samples and ice in the bag until the cooler is full with ice;
- Placing the wet ice in resealable bags prior to placing in cooler to prevent leakage;
- Recording the FedEx airbill number and recording "FedEx" in the Received By box on the COC;
- Placing the completed COC record in a plastic bag and taping to inside cooler lid;
- Placing two custody seals across cooler lid, and taping cooler lid and lengthwise around cooler to secure cooler shut;
- Securing the completed FedEx airbill on the lid of the cooler (ensure that airbill indicated priority overnight delivery). Saturday deliveries should be coordinated in advance with the Project Chemist.

Field Project Tasks (Continued)
(Worksheet #14)

FIELD LOGBOOK PROCEDURES

A permanently bound field logbook with consecutively numbered pages will be assigned to this project. All entries will be recorded in indelible black or blue ink. At the end of each work day, the logbook pages will be signed by the responsible person, and any unused portions of the logbook pages will be crossed out, signed, and dated. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used, and the person receiving the logbook will sign and date the next page to be used. At a minimum, the logbook will contain the following information as applicable:

- Project name and site location
- Date and time
- Personnel in attendance
- General weather information
- Work performed
- Field observations
- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments
- Descriptions of deviations from this SAP
- Problems encountered and corrective action taken
- Identification of field QC samples
- Verbal or written instructions
- Any other events that may affect the samples

LABORATORY DOCUMENTATION PROCEDURES

The laboratory will submit data at the turnaround time to the Project Chemist. This submittal will include the analytical results, and basic QC results (method blanks, laboratory control sample [LCS], surrogates, and MS/MSDs). Within 10 business days after receipt of the turnaround time data, the laboratory will be required to submit a portable data format (PDF) of an EPA Level IV-equivalent data package to the Project Chemist. The data package pages will be sequentially numbered. The data package will contain a table of contents referencing individual sections in the data package, a copy of COC records, a copy of all corrective action reports, and a case narrative documenting the resolution of all corrective actions and

Field Project Tasks (Continued)
(Worksheet #14)

nonconformances, and all samples will be cross-referenced to the associated QC samples. The packages will contain the following:

- Cover page with laboratory name, address, phone number, contact person, and SDG number, as well as the project name (Site 1 NAWC Trenton) and project number (4659.WE11)
- Table of contents
- Cross-reference table
- Case narrative
- Sample management records, including a copy of COC records, shipping documents, and laboratory sample receipt forms (may be provided at end of package)
- Analytical results and QA/QC information by test as follows:
  - <u>Organic raw data sequence</u>
    a. Sample result forms, including method blanks
    b. Sample raw data
    c. Surrogate summaries (surrogate results may appear on the sample result forms)
    d. QC summaries
    e. Tune data (gas chromatograph/mass spectrometer [GC/MS] only)
    f. Initial, daily, and continuing calibration information
    g. Resolution check standards (GC/MS and pesticides), if applicable
    h. QC raw data
    i. Instrument run log
    j. Sample preparation log

If manual integration is required for any organic analysis, supporting information for all manual integrations (i.e., chromatograms before and after manual integration as well as a brief explanation for the manual integration) will be included in the data package deliverables.

  - <u>Inorganic raw data sequence</u>
    a. Sample results forms, including method blanks
    b. Sample raw data

Field Project Tasks (Continued)
(Worksheet #14)

c. QC summaries

d. Initial, daily, and continuing calibration information

e. Calibration blanks, including all related continuing calibration blanks

f. Interference check standards A and B for inductively coupled plasma (ICP)-atomic emission spectrometer (AES) only

g. QC raw data

h. Post-digestion spike results

i. Analytical spike results

j. Method of standard additions

k. ICP-AES serial dilutions

l. Instrument run log

m. Sample preparation log

All relevant laboratory raw data and documentation including, but not limited to, logbook, data sheets, electronic files, and reports, will be maintained by the laboratory for at least 5 years.

In addition to the PDF data package requirements, an electronic data deliverable (EDD) will be submitted by the laboratory in a format compatible with TtEC requirements. Both the PDF and EDDs will present results to two or three significant figures. For organic results, at least two significant figures will be used for all results. For inorganic results, at least two significant figures will be used for results less than 10, and at least three significant figures will be used for results greater than 10. Results for QC analyses (method blanks, MS/MSD, LCS, and duplicates) will be reported up to three significant figures.

When revisions to laboratory data reports are required, the revised pages will be stamped with the notation “amended or revised report.” If revisions affect the laboratory EDDs, the revised EDD will then be sent along with the revised PDF pages to the Project Chemist.

DATA MANAGEMENT PROCEDURES

Field sampling information will be recorded in field logbooks. The logbooks will be numbered sequentially on the cover by the Project Quality Control Manager (PQCM) and that number will be entered into a log sheet maintained by the PQCM. In addition, survey data will be recorded to identify all the sample locations.

Field Project Tasks (Continued)

(Worksheet #14)

Analytical data and associated survey data will be submitted to the Naval Installation Restoration Information Solution website in Navy Electronic Data Deliverable (NEDD) format as directed by the Navy. In addition, the data shall also be submitted to the NJDEP Site Remediation Program Hazsite website.

Field SOPs Reference Table

(Worksheet #21)

Sampling standard operating procedures are not used for this project. Instead, the details of the sampling procedures associated with this SAP are described in the previous section under Field Project Tasks (Worksheet #14).

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Sample Details Table
(Worksheets #18, 19, 20, and 30)

Delineation Soil Samples At Soil Boring SB-07

All samples analyzed by: Katahdin Analytical Services 600 Technology Way Scarborough, ME 04074 Phone: 207-874-2400	**Analysis Group**	VOCs (TCE only)
	EPA Preparation/ Analytical Method	5035A/8260B
	Laboratory SOP Reference	CA-214/CA-202
	Container Type	Using a 5 gram disposable syringe (like a Terra Core), 5 gram aliquot will be placed in three 40 ml vials – two with 5 mls of deionized water each and one with 5 mls of methanol. In addition, one 2 ounce glass jar of soil will be collected for percent moisture analysis.
	Preservative	4 ± 2°C
	Holding Time (Preparation/ Analysis)	48 hours to freeze / 14 days to analyze
Location ID [a]	**Sample Depth (feet)**	
SITE1-SB-07-01 through SITE 1-SB-07-09	See Sampling Design and Rationale (Worksheet #17)	X

Sample Details Table (Continued)

(Worksheets #18, 19, 20, and 30)

Confirmation Samples

All samples analyzed by: Katahdin Analytical Services 600 Technology Way Scarborough, ME 04074 Phone: 207-874-2400	**Analysis Group**	VOCs	Metals
	EPA Preparation/ Analytical Method	5035A/8260B	3050B or 3060A/6010C and 7471B
	Laboratory SOP Reference	CA-214/CA-202	CA-605/CA-608 and CA-611
	Container Type	Using a 5 gram disposable syringe (like a Terra Core), 5 gram aliquot will be placed in three 40 ml vials – two with 5 mls of deionized water each and one with 5 mls of methanol.	One 4 ounce glass jar
	Preservative	4 ± 2°C	
	Holding Time (Preparation/ Analysis)	48 hours to freeze / 14 days to analyze	180 days for all metals except mercury is 28 days
Location ID [a]	**Sample Depth (feet)**		
West End Drainage Ditch: SITE1-SW-01 through SITE 1-SW-40	See Sampling Design and Rationale (Worksheet #17)	X	X
SB-07 area (if required): SITE1-SB-07-SW-01 through SITE 1-SB-07-SW-20	See Sampling Design and Rationale (Worksheet #17)	X	X

Sample Details Table (Continued)

(Worksheets #18, 19, 20, and 30)

Backfill Soil Samples

All samples analyzed by: Katahdin Analytical Services 600 Technology Way Scarborough, ME 04074 Phone: 207-874-2400	**Analysis Group**	VOCs	SVOCs	Pesticides	PCBs	Metals	Cyanide
	EPA Preparation/ Analytical Method	5035A/8260B	3540C or 3550C/8270D	3540C or 3550C/8081B	3540C or 3550C/8082A	3050B or 3060A/6010C and 7471B	9012B
	Laboratory SOP Reference	CA-214/CA-202	CA-526 or CA-512/CA-226	CA-524 or CA-500/CA-302	CA-524 or CA-500/CA-329	CA-605/CA-608 and CA-611	CA-753
	Container Type	Using a 5 gram disposable syringe (like a Terra Core), 5 gram aliquot will be placed in three 40 ml vials – two with 5 mls of deionized water each and one with 5 mls of methanol.	Four eight ounce glass jars				
	Preservative	4 ± 2°C					
	Holding Time (Preparation/ Analysis)	48 hours to freeze / 14 days to analyze	14 days / 40 days	14 days / 40 days	30 days / 40 days	180 days for all metals except mercury is 28 days	28 days
Location ID [a]	**Sample Depth (feet)**						
SITE1-BCK-1	Not applicable	X	X	X	X	X	X

NOTES:

[a] Field QC samples (such as field duplicates and MS/MSDs) will be designated as described in Field Project Tasks (Worksheet #14).

Sample Details Table (Continued)
(Worksheets #18, 19, 20, and 30)

LABORATORY QUALIFICATIONS

Katahdin Analytical Services located in Maine has been selected to analyze samples for this project and has current Department of Defense Environmental Laboratory Accreditation Program accreditation (included in Attachment A of this SAP) for the methods listed in this SAP and will maintain current status throughout the duration of this project. Katahdin Analyical Services also has current NJDEP National Environmental Laboratory Accreditation Program certification for the methods listed in this SAP.

Reference Limits and Evation Tables
(Worksheet #15)

Matrix: Soil
Analytical Group: VOCs (Delineation samples at SB-07)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Trichloroethene (TCE)	79-01-6	20,000	[a]	5	5	2.5	0.59

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

The following analyte lists are based on the analytes listed in the NJDEP Remediation Standards Rule, dated May 7, 2012, specifically the non-residential direct contact soil remediation standards listed in Table 1B of that document. This document can be found under http://www.nj.gov/dep/rules/rules/njac7_26d.pdf.

Matrix: Soil
Analytical Group: VOCs (Confirmation and Backfill soil samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
1,1,1-Trichloroethane	71-55-6	4,200,000	[a]	5	5	2.5	0.42
1,1,2,2-Tetrachloroethane	79-34-5	3,000	[a]	5	5	2.5	0.84
1,1,2-Trichloroethane	79-00-5	6,000	[a]	5	5	2.5	0.97
1,1-Dichloroethane	75-34-3	24,000	[a]	5	5	2.5	1.7
1,1-Dichloroethene	75-35-4	150,000	[a]	5	5	2.5	0.93
1,2-Dibromomethane	106-93-4	40	[a]	5	5	2.5	1.2
1,2-Dibromo-3-chloropropane	96-12-8	200	[a]	5	5	2.5	1.5
1,2-Dichlorobenzene	95-50-1	59,000,000	[a]	5	5	2.5	0.78
1,2-Dichloroethane	107-06-2	3,000	[a]	5	5	2.5	1
1,2-Dichloropropane	78-87-5	5,000	[a]	5	5	2.5	1.4
1,3-Dichlorobenzene	541-73-1	59,000,000	[a]	5	5	2.5	0.62
1,2,4-Trichlorobenzene	120-82-1	820,000	[a]	5	5	2.5	0.79
1,4-Dichlorobenzene	106-46-7	13,000	[a]	5	5	2.5	0.44
2-Butanone	78-93-3	44,000,000	[a]	25	25	12.5	5.9
Acrolein	107-02-8	1,000	[a]	50	50	25	6.6
Acrylonitrile	107-13-1	3,000	[a]	25	25	19	13

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Benzene	71-43-2	5,000	[a]	5	5	2.5	0.92
Bromodichloromethane	75-27-4	3,000	[a]	5	5	2.5	0.6
Bromoform	75-25-2	280,000	[a]	5	5	2.5	0.7
Bromomethane	74-83-9	59,000	[a]	10	10	5	1.1
Carbon disulfide	75-15-0	110,000,000	[a]	5	5	2.5	0.78
Carbon tetrachloride	56-23-5	2,000	[a]	5	5	2.5	1.3
Chlorobenzene	108-90-7	7,400,000	[a]	5	5	2.5	0.51
Chloroethane	75-00-3	1,100,000	[a]	10	10	5	1.3
Chloroform	67-66-3	2,000	[a]	5	5	2.5	0.35
Chloromethane	74-87-3	12,000	[a]	10	10	5	1.4
cis-1,2-Dichloroethene	156-59-2	560,000	[a]	5	5	2.5	0.91
cis-1,3-Dichloropropene	10061-01-5	7,000 [b]	[a]	5	5	2.5	0.72
Dibromochloromethane	124-48-1	8,000	[a]	5	5	2.5	1
Dichlorodifluoromethane	75-71-8	230,000,000	[a]	10	10	5	0.92
Ethylbenzene	100-41-4	110,000,000	[a]	5	5	2.5	0.65
Methyl tert-butyl ether	1634-04-4	320,000	[a]	5	5	2.5	1.1
Methylene chloride	75-09-2	97,000	[a]	25	25	12.5	7.9
Styrene	100-42-5	260,000	[a]	5	5	2.5	0.51
Tertiary butyl alcohol	75-65-0	11,000,000	[a]	25	25	12.5	11
Tetrachloroethene	127-18-4	5,000	[a]	5	5	2.5	1.2
Toluene	108-88-3	91,000,000	[a]	5	5	2.5	1.4

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
trans-1,2-Dichloroethene	156-60-5	720,000	[a]	5	5	2.5	0.71
trans-1,3-Dichloropropene	10061-02-6	7,000 [b]	[a]	5	5	2.5	0.86
Trichloroethene	79-01-6	20,000	[a]	5	5	2.5	0.59
Trichlorofluoromethane	75-69-4	340,000,000	[a]	10	10	5	0.91
Vinyl chloride	75-01-4	2,000	[a]	10	10	5	0.87
Xylenes (total)	1330-20-7	170,000,000	[a]	15	15	7.5	1.3

Reference Limits and Evaluation Tables (Continued)
(Worksheet #15)

Matrix: Soil
Analytical Group: SVOCs (Backfill soil samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
1,1'-Biphenyl	92-52-4	34,000,000	[a]	330	330	248	73
1,2-Diphenylhydrazine	122-66-7	2,000	[a]	660	660	495	142
2,4,5-Trichlorophenol	95-95-4	68,000,000	[a]	820	820	615	155
2,4,6-Trichlorophenol	88-06-2	74,000	[a]	330	330	248	155
2,4-Dichlorophenol	120-83-2	2,100,000	[a]	330	330	248	150
2,4-Dimethylphenol	105-67-9	14,000,000	[a]	330	330	248	165
2,4-Dinitrophenol	51-28-5	1,400,000	[a]	820	820	615	377
2,4-Dinitrotoluene	121-14-2	3,000	[a]	330	330	248	85
2,6-Dinitrotoluene	606-20-2	3,000	[a]	330	330	248	79
2-Chlorophenol	95-57-8	2,200,000	[a]	330	330	248	164
2-Methylnaphthalene	91-57-6	2,400,000	[a]	330	330	248	92
2-Methylphenol (o-cresol)	95-48-7	3,400,000	[a]	330	330	248	200
2-Nitroaniline	88-74-4	23,000,000	[a]	820	820	615	75
3,3′-Dichlorobenzidine	91-94-1	4,000	[a]	330	330	248	114
3/4-Methylphenol(m/p-cresol)	108-39-4/106-44-5 [c]	340,000	[a]	330	330	248	187
4,6-Dinitro-2-methylphenol	534-52-1	68,000	[a]	820	820	615	337
Acetophenone	98-86-2	5,000	[a]	330	330	248	178
Atrazine	1912-24-9	2,400,000	[a]	330	330	248	91

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Benzaldehyde	100-52-7	68,000,000	[a]	330	330	248	120
Benzidine	92-87-5	700 [d]	[a]	1500	1500	1125	100
bis(2-Chloroethyl)ether	111-44-4	2,000	[a]	330	330	248	81
bis(2-Chloroisopropyl)ether	108-60-1	67,000	[a]	330	330	248	89
bis(2-Ethylhexyl)phthalate	117-81-7	140,000	[a]	330	330	248	98
Butylbenzylphthalate	85-68-7	14,000,000	[a]	330	330	248	93
Caprolactam	105-60-2	340,000,000	[a]	330	330	248	144
Carbazole	86-74-8	96,000	[a]	330	330	248	111
Diethylphthalate	84-66-2	550,000,000	[a]	330	330	248	80
Di-n-butylphthalate	84-74-2	68,000,000	[a]	330	330	248	101
Di-n-octylphthalate	117-84-0	27,000,000	[a]	330	330	248	211
Hexachlorobenzene	118-74-1	1,000	[a]	330	330	248	82
Hexachlorobutadiene	87-68-3	25,000	[a]	330	330	248	83
Hexachlorocyclopentadiene	77-47-4	110,000	[a]	330	330	248	82
Hexachloroethane	67-72-1	140,000	[a]	330	330	248	96
Isophorone	78-59-1	2,000,000	[a]	330	330	248	75
Nitrobenzene	98-95-3	340,000	[a]	330	330	248	91
n-Nitrosodimethylamine	62-75-9	700	[a]	330	330	248	87
n-Nitrosodi-n-propylamine	621-64-7	300 [d]	[a]	330	330	248	83
n-Nitrosodiphenylamine	86-30-6	390,000	[a`]	330	330	248	219
Pentachlorophenol	87-86-5	10,000	[a]	820	820	615	237

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Phenol	108-95-2	210,000,000	[a]	330	330	248	156
Acenaphthene	83-32-9	37,000,000	[a]	330	330	248	65
Acenaphthylene	208-96-8	300,000,000	[a]	330	330	248	70
Anthracene	120-12-7	30,000,000	[a]	330	330	248	84
Benzo(a)anthracene	56-55-3	2,000	[a]	330	330	248	86
Benzo(a)pyrene	50-32-8	200 [d]	[a]	330	330	248	93
Benzo(b)fluoranthene	205-99-2	2,000	[a]	330	330	248	134
Benzo(g,h,i)perylene	191-24-2	30,000,000	[a]	330	330	248	104
Benzo(k)fluoranthene	207-08-9	23,000	[a]	330	330	248	83
Chrysene	218-01-9	230,000	[a]	330	330	248	95
Dibenzo(a,h)anthracene	53-70-3	200 [d]	[a]	330	330	248	128
Fluoranthene	206-44-0	24,000,000	[a]	330	330	248	106
Fluorene	86-73-7	24,000,000	[a]	330	330	248	81
Indeno(1,2,3-cd)pyrene	193-39-5	2,000	[a]	330	330	248	122
Naphthalene	91-20-3	17,000	[a]	330	330	248	87
Phenanthrene	85-01-8	300,000,000	[a]	330	330	248	83
Pyrene	129-00-0	18,000,000	[a]	330	330	248	101

Reference Limits and Evaluation Tables (Continued)
(Worksheet #15)

Matrix: Soil
Analytical Group: Pesticides (Backfill soil samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
4,4′-DDD	72-54-8	13,000	[a]	3.3	3.3	1.65	0.2
4,4′-DDE	72-55-9	9,000	[a]	3.3	3.3	1.65	0.19
4,4′-DDT	50-29-3	8,000	[a]	3.3	3.3	1.65	0.31
alpha-BHC	319-84-6	500	[a]	1.7	1.7	0.85	0.34
Aldrin	309-00-2	200	[a]	1.7	1.7	0.85	0.28
alpha-Chlordane	5103-71-9	1,000 (total Chlordane)	[a]	1.7	1.7	0.85	0.21
gamma-chlordane	5103-74-2		[a]	1.7	1.7	0.85	0.23
beta-BHC	319-85-7	2,000	[a]	1.7	1.7	0.85	0.33
Dieldrin	60-57-1	200	[a]	3.3	3.3	1.65	0.22
Endosulfan I	959-98-8	6,800,000 (total Endosulfan)	[a]	1.7	1.7	0.85	0.24
Endosulfan II	33213-65-9		[a]	3.3	3.3	1.65	0.34
Endosulfan sulfate	1031-07-8	6,800,000	[a]	3.3	3.3	1.65	0.58
Endrin	72-20-8	340,000	[a]	3.3	3.3	1.65	0.85
gamma-BHC (Lindane)	58-89-9	2,000	[a]	1.7	1.7	0.85	0.27
Heptachlor	76-44-8	700	[a]	1.7	1.7	0.85	0.29
Heptachlor epoxide	1024-57-3	300	[a]	1.7	1.7	0.85	0.22

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Methoxychlor	72-43-5	5,700,000	[a]	17	17	8.5	0.5
Toxaphene	8001-35-2	3,000	[a]	33	33	16	7

Reference Limits and Evaluation Tables (Continued)
(Worksheet #15)

Matrix: Soil
Analytical Group: PCBs (Backfill soil samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Aroclor 1016	12674-11-2	1,000 for total PCBs	[a]	17	17	8.5	6
Aroclor 1221	11104-28-2		[a]	17	17	8.5	7.9
Aroclor 1232	11141-16-5		[a]	17	17	10	9.3
Aroclor 1242	53469-21-9		[a]	17	17	8.5	5.8
Aroclor 1248	12672-29-6		[a]	17	17	8.5	6.1
Aroclor 1254	11097-69-1		[a]	17	17	8.5	4.7
Aroclor 1260	11096-82-5		[a]	17	17	8.5	6

Reference Limits and Evaluation Tables (Continued)
(Worksheet #15)

Matrix: Soil
Analytical Group: Metals (Confirmation and Backfill soil samples)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Antimony	7440-36-0	450	[a]	0.8	0.8	0.5	0.07
Arsenic	7440-38-2	19	[a]	0.8	0.8	0.5	0.068
Barium	7440-39-3	59,000	[a]	0.5	0.5	0.3	0.026
Beryllium	7440-41-7	140	[a]	0.5	0.5	0.05	0.0068
Cadmium	7440-43-9	78	[a]	1	1	0.3	0.01
Cobalt	7440-48-4	590	[a]	3	3	0.4	0.03
Copper	7440-50-8	45,000	[a]	2.5	2.5	1	0.16
Lead	7439-92-1	800	[a]	0.5	0.5	0.4	0.09
Manganese	7439-96-5	5,900	[a]	0.5	0.5	0.4	0.16
Mercury	7439-97-6	65	[a]	0.033	0.033	0.017	0.0052
Nickel	7440-02-0	23,000	[a]	4	4	0.4	0.04
Selenium	7782-49-2	5,700	[a]	1	1	0.7	0.17
Silver	7440-22-4	5,700	[a]	1.5	1.5	0.4	0.03
Thallium	7440-28-0	79	[a]	1.5	1.5	0.5	0.09
Vanadium	7440-62-2	1,100	[a]	2.5	2.5	0.4	0.04
Zinc	7440-66-6	110,000	[a]	2.5	2.5	1	0.17

Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Cyanide	57-12-5	23,000	[a]	1	1	0.8	N/A

Notes:

Soil analytical results will be reported as dry-weight corrected. Non-detected results will be reported by the laboratory with a "U" qualifier at the LOD. Results between the DL and LOQ will be reported as "J" flagged as estimated.

[a] The values listed are from the NJDEP Remediation Standards Rule, dated May 7, 2012, specifically the non-residential direct contact soil remediation standards listed in Table 1B of that document. This document can be found under http://www.nj.gov/dep/rules/rules/njac7_26d.pdf.

[b] The value listed is for total 1,3-dichloropropene; however the laboratory reports the isomers as cis and trans.

[c] Since 3/4-methylphenol cannot be separated during analysis, the result will be reported under the CAS number for 3/4-methylphenol as listed in the NEDD valid value list.

[d] The project action limit is below the listed project quantitation limit goal but is above the laboratory detection limit (DL).

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Analytical SOP References Table

(Worksheet #23)

Lab SOP Number[a]	Title, Revision Date, and/or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Variance to QSM?	Modified for Project Work?(Y/N)
CA-202	Analysis of VOAs by Purge and Trap (Gas Chromatograph/Mass Spectrometer) GC/MS: SW-846 Method 8260, 04/2014, Revision 15.	Definitive	Soil VOCs	GC/MS	None	N
CA-226	Analysis of SVOAs by Capillary Column GC/MS: SW-846 Method 8270D, 08/2015, Revision 6.	Definitive	Soil SVOCs	GC/MS	None	N
CA-302	Analysis of Pesticides By Gas Chromatography/Electron Capture Detector (GC/ECD): SW-846 Method 8081, 07/2015, Revision 15.	Definitive	Soil Pesticides	GC/ECD	None	N
CA-329	Analysis of PCBs as Total Aroclors By Gas Chromatography/Electron Capture Detector (GC/ECD): SW-846 Method 8082, 08/2014, Revision 14.	Definitive	Soil PCBs	GC/ECD	None	N
CA-608	Trace Metals Analysis By Inductively Coupled Plasma (ICP)-AES Using EPA Method 6010, 12/2014, Revision 15.	Definitive	Soil Metals	ICP	None	N
CA-611	Digestion And Analysis Of Solid Samples For Mercury By EPA Method 7471, 06/2014, Revision 10.	Definitive	Soil Mercury	Cold vapor analyzer	None	N
CA-773	Colorimetric Analysis Of Total And Ammenable Cyanide Using The Automated Konelab Multiwavelength Photometric Analyzer, 07/2011, Revision 5.	Definitive	Soil Cyanide	Konelab	None	N

Notes:

[a] The analytical SOP revision number and date listed are current as of the date this SAP was published.

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Laboratory QC Samples Table
(Worksheet #28)

Matrix: Soil
Analytical Group: VOCs
Analytical Method/SOP Reference: EPA 8260B/CA-202

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.	Correct the problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Katahdin Analytical Services Analyst	Accuracy	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.
LCS and/or LCSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Katahdin Analytical Services Analyst	Accuracy	See following page

Laboratory QC Samples Table (Continued)

(Worksheet #28)

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Katahdin Analytical Services Analyst	Accuracy/ Precision	See following page
Surrogate	Per sample, blank, LCS, LCSD, MS, MSD	1,2-Dichloroethane-d4: 71-136% 4-Bromofluorobenzene: 79-119% Dibromofluoromethane: 78-119% Toluene-d8: 77-121%	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprepped within hold time.	Katahdin Analytical Services Analyst	Accuracy	1,2-Dichloroethane-d4: 71-136% 4-Bromofluorobenzene: 79-119% Dibromofluoromethane: 78-119% Toluene-d8: 77-121%

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Method/SOP QC Acceptance Limits and Measurement Performance Criteria for VOCs

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
1,1,1-Trichloroethane	73-130	≤ 30
1,1,2,2-Tetrachloroethane	70-124	≤ 30
1,1,2-Trichloroethane	78-121	≤ 30
1,1-Dichloroethane	76-125	≤ 30
1,1-Dichloroethene	70-131	≤ 30
1,2-Dibromomethane	78-122	≤ 30
1,2-Dibromo-3-chloropropane	61-132	≤ 30
1,2-Dichlorobenzene	78-121	≤ 30
1,2-Dichloroethane	73-128	≤ 30
1,2-Dichloropropane	76-123	≤ 30
1,3-Dichlorobenzene	77-121	≤ 30
1,2,4-Trichlorobenzene	67-129	≤ 30
1,4-Dichlorobenzene	75-120	≤ 30
2-Butanone	51-148	≤ 30
Acrolein	47-155	≤ 30
Acrylonitrile	65-134	≤ 30
Benzene	77-121	≤ 30
Bromodichloromethane	75-127	≤ 30
Bromoform	67-132	≤ 30
Bromomethane	53-143	≤ 30
Carbon disulfide	63-132	≤ 30

Laboratory QC Samples Table (Continued)

(Worksheet #28)

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
Carbon tetrachloride	70-135	≤ 30
Chlorobenzene	79-120	≤ 30
Chloroethane	59-139	≤ 30
Chloroform	78-123	≤ 30
Chloromethane	50-136	≤ 30
cis-1,2-Dichloroethene	77-123	≤ 30
cis-1,3-Dichloropropene	74-126	≤ 30
Dibromochloromethane	74-126	≤ 30
Dichlorodifluoromethane	29-149	≤ 30
Ethylbenzene	76-122	≤ 30
Methyl tert-butyl ether	73-125	≤ 30
Methylene chloride	70-128	≤ 30
Styrene	76-124	≤ 30
Tertiary butyl alcohol	68-133	≤ 30
Tetrachloroethene	73-128	≤ 30
Toluene	77-121	≤ 30
trans-1,2-Dichloroethene	74-125	≤ 30
trans-1,3-Dichloropropene	71-130	≤ 30
Trichloroethene	77-123	≤ 30
Trichlorofluoromethane	62-140	≤ 30
Vinyl chloride	56-135	≤ 30
Xylenes, total	78-124	≤ 30

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Matrix: Soil
Analytical Group: SVOCs
Analytical Method/SOP Reference: EPA 8270D/CA-226

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.	Correct the problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Katahdin Analytical Services Analyst	Accuracy	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.
LCS and/or LCSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Katahdin Analytical Services Analyst	Accuracy	See following page

Laboratory QC Samples Table (Continued)

(Worksheet #28)

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Katahdin Analytical Services Analyst	Accuracy/ Precision	See following page
Surrogate	Per sample, blank, LCS, LCSD, MS, MSD	2,4,6-Tribromophenol: 39-132% 2-Fluorobiphenyl: 44-115% 2-Fluorophenol: 35-115% Nitrobenzene-d5: 37-122% Phenol-d5: 33-122% Terphenyl-d14: 54-127%	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprepped within hold time.	Katahdin Analytical Services Analyst	Accuracy	2,4,6-Tribromophenol: 39-132% 2-Fluorobiphenyl: 44-115% 2-Fluorophenol: 35-115% Nitrobenzene-d5: 37-122% Phenol-d5: 33-122% Terphenyl-d14: 54-127%

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Method/SOP QC Acceptance Limits and Measurement Performance Criteria for SVOCs

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
1,1'-Biphenyl	40-117	≤ 30
1,2-Diphenylhydrazine	41-125	≤ 30
2,4,5-Trichlorophenol	41-124	≤ 30
2,4,6-Trichlorophenol	39-126	≤ 30
2,4-Dichlorophenol	40-122	≤ 30
2,4-Dimethylphenol	30-127	≤ 30
2,4-Dinitrophenol	17-77 (lab limits)	≤ 30
2,4-Dinitrotoluene	48-126	≤ 30
2,6-Dinitrotoluene	46-124	≤ 30
2-Chlorophenol	34-121	≤ 30
2-Methylnaphthalene	38-122	≤ 30
2-Methylphenol (o-cresol)	32-122	≤ 30
2-Nitroaniline	44-127	≤ 30
3,3-Dichlorobenzidine	22-121	≤ 30
3/4-Methylphenol (m,p-cresol)	34-119	≤ 30
4,6-Dinitro-2-methylphenol	29-132	≤ 30
Acetophenone	33-115	≤ 30
Atazine	47-127	≤ 30
Benzaldehyde	10-150 (lab limits0	≤ 30
Benzidine	10-150 (lab limits)	≤ 30
bis(2-Chloroethyl)ether	31-120	≤ 30

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
bis(2-Chloroisopropyl)ether	33-131	≤ 30
bis(2-Ethylhexyl)phthalate	51-133	≤ 30
Butylbenzylphthalate	48-132	≤ 30
Caprolactam	46-117	≤ 30
Carbazole	50-123	≤ 30
Diethylphthalate	50-124	≤ 30
Di-n-butylphthalate	51-128	≤ 30
Di-n-octylphthalate	45-140	≤ 30
Hexachlorobenzene	45-122	≤ 30
Hexachlorobutadiene	32-123	≤ 30
Hexachlorocyclopentadiene	10-128 (lab limits)	≤ 30
Hexachloroethane	28-117	≤ 30
Isophorone	30-122	≤ 30
Nitrobenzene	34-122	≤ 30
n-Nitrosodimethylamine	23-120	≤ 30
n-Nitrosodi-n-propylamine	36-120	≤ 30
n-Nitrosodiphenylamine	38-127	≤ 30
Pentachlorophenol	25-133	≤ 30
Phenol	34-121	≤ 30
Acenaphthene	40-123	≤ 30
Acenaphthylene	32-132	≤ 30
Anthracene	47-123	≤ 30

Laboratory QC Samples Table (Continued)

(Worksheet #28)

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
Benzo(a)anthracene	49-126	≤ 30
Benzo(a)pyrene	45-129	≤ 30
Benzo(b)fluoranthene	45-132	≤ 30
Benzo(g,h,i) perylene	43-134	≤ 30
Benzo(k)fluoranthene	47-132	≤ 30
Chrysene	50-124	≤ 30
Dibenzo(a,h)anthracene	45-134	≤ 30
Fluoranthene	50-127	≤ 30
Fluorene	43-125	≤ 30
Indeno(1,2,3-cd)pyrene	45-133	≤ 30
Naphthalene	35-123	≤ 30
Phenanthrene	50-121	≤ 30
Pyrene	47-127	≤ 30

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Matrix: Soil
Analytical Group: Pesticides
Analytical Method/SOP Reference: EPA 8081B/CA-302

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct the problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Katahdin Analytical Services Analyst	Accuracy	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.
LCS and/or LCSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Katahdin Analytical Services Analyst	Accuracy	See following page

Laboratory QC Samples Table (Continued)

(Worksheet #28)

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Katahdin Analytical Services Analyst	Accuracy/ Precision	See following page
Surrogate	Per sample, blank, LCS, LCSD, MS, MSD	Decachlorobiphenyl: 44-99 % (lab limits) Tetrachloro-m-xylene: 42-129%	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprepped within hold time.	Katahdin Analytical Services Analyst	Accuracy	Decachlorobiphenyl: 44-99% (lab limits) Tetrachloro-m-xylene: 42-129%

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Method/SOP QC Acceptance Limits and Measurement Performance Criteria for Pesticides

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
4,4'-DDD	56-139	≤ 30
4,4'-DDE	56-134	≤ 30
4,4'-DDT	50-141	≤ 30
alpha-BHC	45-137	≤ 30
Aldrin	45-136	≤ 30
alpha-Chlordane	54-133	≤ 30
gamma-Chlrodane	53-135	≤ 30
beta-BHC	50-1336	≤ 30
Dieldrin	56-136	≤ 30
Endosulfan I	53-132	≤ 30
Endosulfan II	53-134	≤ 30
Endosulfan sulfate	55-136	≤ 30
Endrin	57-140	≤ 30
gamma-BHC (Lindane)	49-135	≤ 30
Heptachlor	47-136	≤ 30
Heptachlor Epoxide	52-136	≤ 30
Methoxychlor	52-143	≤ 30
Toxaphene	33-141	≤ 30

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Matrix: Soil
Analytical Group: PCBs
Analytical Method/SOP Reference: EPA 8082A/CA-329

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct the problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Katahdin Analytical Services Analyst	Accuracy	No analytes detected > ½ LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.
LCS and/or LCSD	1 per preparatory batch (defined as ≤ 20 samples)	Aroclor 1016: 47-134% Aroclor 1254: 67-135% Aroclor 1260: 53-140% RPD ≤ 30%	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Katahdin Analytical Services Analyst	Accuracy	Aroclor 1016: 47-134% Aroclor 1254: 67-135% Aroclor 1260: 53-140% RPD ≤ 30%

Laboratory QC Samples Table (Continued)

(Worksheet #28)

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Aroclor 1016: 47-134% Aroclor 1260: 53-140% RPD ≤ 30%	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Katahdin Analytical Services Analyst	Accuracy/ Precision	Aroclor 1016: 47-134% Aroclor 1260: 53-140% RPD ≤ 30%
Surrogate	Per sample, blank, LCS, LCSD, MS, MSD	Decachlorobiphenyl: 59-124 (lab limits) Tetrachloro-m-xylene: 44-130	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprepped within hold time.	Katahdin Analytical Services Analyst	Accuracy	Decachlorobiphenyl: 59-124 (lab limits) Tetrachloro-m-xylene: 44-130

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Matrix: Soil
Analytical Group: Metals
Analytical Method/SOP Reference: EPA 6010C and 7471B/CA-608 and CA-611

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ and greater than 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Correct the problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Katahdin Analytical Services Analyst	Accuracy	No analytes detected > ½ LOQ and greater than 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.
Calibration Blank	Before beginning a sample run, after every 10 samples, and at end of the analysis sequence	No analytes detected > LOD	Correct problem. Re-prep and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Katahdin Analytical Services Analyst	Accuracy	No analytes detected > LOD

Laboratory QC Samples Table (Continued)

(Worksheet #28)

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
LCS and/or LCSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Katahdin Analytical Services Analyst	Accuracy	See following page
MS and/or MSD	1 per preparatory batch (defined as ≤ 20 samples)	See following page	Examine the project-specific DQOs. If the matrix spike falls outside of DoD criteria, additional quality control tests are required to evaluate matrix effects.	Katahdin Analytical Services Analyst	Accuracy/ Precision	See following page
Serial dilution	Each new sample matrix	1:5 dilution must agree within ±10% of original determination	Perform post-digestion spike (PDS) addition.	Katahdin Analytical Services Analyst	Accuracy	1:5 dilution must agree within ±10% of original determination
Post-digestion spike	When serial dilution or matrix spike fails	All metals 80–120%	Narrate	Katahdin Analytical Services Analyst	Accuracy	All metals 80–120%

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Method/SOP QC Acceptance Limits and Measurement Performance Criteria for Metals

Analyte	LCS/LCSD or MS/MSD Percent Recovery	LCS/LCSD or MS/MSD Relative Percent Difference
Antimony	79-114	≤ 20
Arsenic	82-111	≤ 20
Barium	83-113	≤ 20
Beryllium	83-113	≤ 20
Cadmium	82-113	≤ 20
Cobalt	85-112	≤ 20
Copper	81-117	≤ 20
Lead	81-112	≤ 20
Manganese	84-114	≤ 20
Mercury	80-124	≤ 20
Nickel	83-113	≤ 20
Selenium	78-111	≤ 20
Silver	82-112	≤ 20
Thallium	83-111	≤ 20
Vanadium	82-114	≤ 20
Zinc	82-113	≤ 20

Laboratory QC Samples Table (Continued)
(Worksheet #28)

Matrix: Soil
Analytical Group: Cyanide
Analytical Method/SOP Reference [a]: EPA 9012B / CA-773

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch	Analytes < ½ LOQ, < 1/10 sample concentration, or <1/10 regulatory limits, whichever is greater. Common laboratory contaminants < LOQ.	Correct the problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Analyst	Accuracy	Analytes < ½ LOQ, < 1/10 sample concentration, or <1/10 regulatory limits, whichever is greater. Common laboratory contaminants < LOQ.
LCS and/or LCSD and MS/MSD	1 per preparatory batch	76-120% RPD ≤ 20	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Analyst	Accuracy/ Precision	76-120% RPD ≤ 20

Data Verification and Validation (Steps I and IIa/IIb) Process Table

(Worksheets #34, 35, and 36)

Data Review Input	Description	Responsible for Verification (Title and Organizational Affiliation)	Internal/ External
Field logbook	Field logbooks will be reviewed weekly and verified for information accuracy and completeness. The inspection will be documented in daily QC reports.	PQCM, TtEC	I
COC forms	COC forms will be reviewed daily upon their completion and verified for completeness.	PQCM, TtEC Project Chemist, TtEC	I I
Sample receipt	Receipt of samples by the laboratory will be verified.	Project Chemist, TtEC	I
Sample logins	Sample login information will be reviewed and verified for accuracy and completeness in accordance with the requirements in this SAP.	PM, Katahdin Analytical Services Project Chemist, TtEC	E I
Laboratory data prior to release	Laboratory data will be reviewed to verify that the requirements in this SAP have been met. Prior to release, data will be verified as follows:	PM, Katahdin Analytical Services	E
	All data (100 percent) comply with the method- and project-specific requirements and any deviations or failure to meet criteria is documented for the project file.	Analyst, Katahdin Analytical Services	E
	All manual entries (100 percent) are free of transcription errors and manual calculations are accurate; computer calculations are spot-checked to verify program validity; data reported are compliant with method- and project-specific QC requirements; raw data and supporting materials are complete; spectral assignments are confirmed; descriptions of deviations from method or project requirements are documented; significant figures and rounding have been appropriately used; reported values include dilution factors; and results are reasonable.	Peer Analyst, Katahdin Analytical Services	E
	Data reported are compliant with method- and project-specific QC requirements; the reported information is complete; the information in the report narrative is complete and accurate; and results are reasonable.	Supervisor, Katahdin Analytical Services	E
	Data reported are compliant with method- and project-specific QC; analytical methods are performed in compliance with approved SOPs. This review may be conducted after release of data since reviews are done only on 10 percent of the data.	QA Manager, Katahdin Analytical Services	E

Data Verification and Validation (Steps I and IIa/IIb) Process Table (Continued)

(Worksheets #34, 35, and 36)

Data Review Input	Description	Responsible for Verification (Title and Organizational Affiliation)	Internal/ External
Laboratory data due at turnaround time listed on COC	Laboratory data will be verified for having been obtained following the protocols in this SAP and being of sufficient quality to satisfy the data quality objectives.	Project Chemist, TtEC	I
Laboratory data packages	All laboratory data packages will be verified by the laboratory performing the work for completeness and technical accuracy prior to submittal. Data packages will then be reviewed by the Project Chemist for accuracy and completeness in accordance with the data package requirements described in this SAP.	PM, Katahdin Analytical Services Project Chemist, TtEC	E I
Electronic data	The PDF data package and EDD will be reviewed to ensure information is accurate.	PM, Katahdin Analytical Services Program Chemist, TtEC	I I
Sample Collection	Ensure that the sampling procedures described in this SAP were used to collect samples and that any deviations to those procedures were documented in a field change request.	PQCM, TtEC Project Chemist, TtEC Program Chemist, TtEC	I I I
Sample Handling	Ensure that the procedures described in this SAP for sample handling, packaging, and transport to the laboratory were followed.	PQCM, TtEC Project Chemist, TtEC	I I
Sample Documentation	Ensure that the COC procedures described in this SAP were followed for sample collection and that logbooks or field forms were completed as required.	PQCM, TtEC Project Chemist, TtEC	I
Analytical Procedures	Ensure that the analytical methods and deliverable requirements described in this SAP were followed including holding times, analyte lists, and QC criteria.	PM, Katahdin Analytical Services Project Chemist, TtEC	E I

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ATTACHMENT A
LABORATORY DOD ELAP ACCREDITATION

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LABORATORY ACCREDITATION BUREAU

Certificate of Accreditation

ISO/IEC 17025:2005 Certificate Number L2223

Katahdin Analytical Services, Inc.

600 Technology Way
Scarborough ME 04074

has met the requirements set forth in L-A-B's policies and procedures, all requirements of ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories" and the U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).*

The accredited lab has demonstrated technical competence to a defined "Scope of Accreditation" and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Accreditation valid through: February 1, 2016

R. Douglas Leonard, Jr., President, COO
Laboratory Accreditation Bureau
Presented the 1st of February 2013

*See the laboratory's Scope of Accreditation for details of accredited parameters
**Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

LABORATORY ACCREDITATION BUREAU

Certificate # L2223

Scope of Accreditation
For
Katahdin Analytical Services, Inc.

600 Technology Way
Scarborough, ME 04074
Leslie Dimond
207-874-2400

In recognition of a successful assessment to ISO/IEC 17025:2005 and the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in the DoD Quality Systems Manual for Environmental Laboratories (DoD QSM v4.2) based on the National Environmental Laboratory Accreditation Conference Chapter 5 Quality Systems Standard (NELAC Voted Revision June 5, 2003), accreditation is granted to Katahdin Analytical Services to perform the following tests:

Accreditation granted through: February 1, 2016

Testing - Environmental

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8081B	2, 4`-DDD
GC/ECD	EPA 8081B	2, 4`-DDE
GC/ECD	EPA 8081B	2, 4`-DDT
GC/ECD	EPA 608; EPA 8081B	4, 4`-DDD
GC/ECD	EPA 608; EPA 8081B	4, 4`-DDE
GC/ECD	EPA 608; EPA 8081B	4, 4`-DDT
GC/ECD	EPA 608; EPA 8081B	Aldrin
GC/ECD	EPA 608; EPA 8081B	alpha-BHC (alpha-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	Alpha-Chlordane
GC/ECD	EPA 608; EPA 8081B	beta-BHC (beta-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	Cis-Nonaclor
GC/ECD	EPA 608; EPA 8081B	Chlordane (tech.)
GC/ECD	EPA 608; EPA 8081B	delta-BHC
GC/ECD	EPA 608; EPA 8081B	Dieldrin
GC/ECD	EPA 608; EPA 8081B	Endosulfan I
GC/ECD	EPA 608; EPA 8081B	Endosulfan II

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 608; EPA 8081B	Endosulfan sulfate
GC/ECD	EPA 608; EPA 8081B	Endrin
GC/ECD	EPA 608; EPA 8081B	Endrin aldehyde
GC/ECD	EPA 8081B	Endrin Ketone
GC/ECD	EPA 8081B	gamma-BHC (Lindane gamma-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	gamma-Chlordane
GC/ECD	EPA 608; EPA 8081B	Heptachlor
GC/ECD	EPA 608; EPA 8081B	Heptachlor epoxide
GC/ECD	EPA 8081B	Hexachlorobenzene
GC/ECD	EPA 8081B	Methoxychlor
GC/ECD	EPA 8081B	Mirex
GC/ECD	EPA 8081B	Oxychlordane
GC/ECD	EPA 608; EPA 8081B	Toxaphene (Chlorinated camphene)
GC/ECD	EPA 8081B	trans-Nonachlor
GC/ECD	EPA 608; EPA 8082A	Aroclor-1016 (PCB-1016)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1221 (PCB-1221)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1232 (PCB-1232)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1242 (PCB-1242)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1248 (PCB-1248)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1254 (PCB-1254)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1260 (PCB-1260)
GC/ECD	EPA 8082A MOD	Aroclor-1262 (PCB-1262)
GC/ECD	EPA 8082A MOD	Aroclor-1268 (PCB-1268)
GC/ECD	EPA 8082A	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)
GC/ECD	EPA 8082A	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)
GC/ECD	EPA 8082A	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)
GC/ECD	EPA 8082A	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 5, 5'-Heptachlorobiphenyl (BZ 180)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 5', 6-Heptachlorobiphenyl (BZ 183)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 5-Hexachlorobiphenyl (BZ 138)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 6, 6'-Heptachlorobiphenyl (BZ 184)

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8082A	2, 2', 3, 4', 5, 5', 6-Heptachlorobiphenyl (BZ 187)
GC/ECD	EPA 8082A	2, 2', 3, 4, 5'-Pentachlorobiphenyl (BZ 87)
GC/ECD	EPA 8082A	2, 2', 3, 5'-Tetrachlorobiphenyl (BZ 44)
GC/ECD	EPA 8082A	2, 2', 4, 4', 5, 5'-Hexachlorobiphenyl (BZ 153)
GC/ECD	EPA 8082A	2, 2', 4, 5, 5'-Pentachlorobiphenyl (BZ 101)
GC/ECD	EPA 8082A	2, 2', 4, 5-Tetrachlorobiphenyl (BZ 48)
GC/ECD	EPA 8082A	2, 2', 4, 5'-Tetrachlorobiphenyl (BZ 49)
GC/ECD	EPA 8082A	2, 2', 5, 5'-Tetrachlorobiphenyl (BZ 52)
GC/ECD	EPA 8082A	2, 2', 5-Trichlorobiphenyl (BZ 18)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4', 5-Hexachlorobiphenyl (BZ 156)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4', 5'-Hexachlorobiphenyl (BZ 157)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4'-Pentachlorobiphenyl (BZ 105)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4', 5, 5'-Heptachlorobiphenyl (BZ 189)
GC/ECD	EPA 8082A	2, 3', 4, 4', 5, 5'-Hexachlorobiphenyl (BZ 167)
GC/ECD	EPA 8082A	2, 3', 4, 4', 5-Pentachlorobiphenyl (BZ 118)
GC/ECD	EPA 8082A	2, 3', 4, 4',5'-Pentachlorobiphenyl (BZ 123)
GC/ECD	EPA 8082A	2, 3', 4, 4'-Tetrachlorobiphenyl (BZ 66)
GC/ECD	EPA 8082A	2, 3, 4, 4', 5-Pentachlorobiphenyl (BZ 114)
GC/ECD	EPA 8082A	2, 4, 4'-Trichlorobiphenyl (BZ 28)
GC/ECD	EPA 8082A	2, 4'-Dichlorobiphenyl (BZ 8)
GC/ECD	EPA 8082A	3, 3', 4, 4', 5, 5'-Hexachlorobiphenyl (BZ 169)
GC/ECD	EPA 8082A	3, 3', 4, 4', 5-Pentachlorobiphenyl (BZ 126)
GC/ECD	EPA 8082A	3, 3', 4, 4'-Tetrachlorobiphenyl (BZ 77)
GC/ECD	EPA 8082A	3, 4, 4', 5-Tetrachlorobiphenyl (BZ 81)
GC/ECD	EPA 8082A	Decachlorobiphenyl (BZ 209)
GC/ECD	EPA 8151A	2, 4, 5-T
GC/ECD	EPA 8151A	2, 4-D
GC/ECD	EPA 8151A	2, 4-DB
GC/ECD	EPA 8151A	Dalapon
GC/ECD	EPA 8151A	Dicamba
GC/ECD	EPA 8151A	Dichloroprop

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8151A	Dinoseb
GC/ECD	EPA 8151A	MCPA
GC/ECD	EPA 8151A	MCPP
GC/ECD	EPA 8151A	Pentachlorophenol
GC/ECD	EPA 8151A	Silvex (2, 4, 5-TP)
GC/FID	EPA 8015C/D MOD	Diesel range organics (DRO)
GC/FID	EPA 8015C/D MOD	Total Petroleum Hydrocarbon (TPH)
GC/FID	EPA 8015C/D MOD	Gasoline range organics (GRO)
GC/FID/PID	MA DEP VPH	Volatile Organic Hydrocarbons
GC/FID	MA DEP EPH	Extractable Petroleum Hydrocarbons
GC/FID	CT ETPH	Total Petroleum Hydrocarbons
GC/FID	TNRCC Method 1005	Total Petroleum Hydrocarbons
GC/FID	FL-PRO	Petroleum Range Organics
GC/ECD	EPA 8011; EPA 504	1, 2-Dibromoethane (EDB)
GC/ECD	EPA 8011; EPA 504	1, 2-Dibromo-3-chloropropane
GC/FID	RSK-175	Methane Ethane Ethene
GC/MS	EPA 8260B/C; EPA 524.2	1, 1, 1, 2-Tetrachloroethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 1, 1-Trichloroethane
GC/MS	EPA 624; 8260B/C; EPA 524.2	1, 1, 2, 2-Tetrachloroethane
GC/MS	EPA 8260B/C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 1, 2-Trichloroethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 1-Dichloroethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 1-Dichloroethene
GC/MS	EPA 8260B/C; EPA 524.2	1, 1-Dichloropropene
GC/MS	EPA 8260B/C; EPA 524.2	1, 2, 3-Trichlorobenzene
GC/MS	EPA 8260B/C; EPA 524.2	1, 2, 3-Trichloropropane
GC/MS	EPA 8260B/C	1,2,3-Trimethylbenzene
GC/MS	EPA 8260B/C; EPA 524.2	1, 2, 4-Trichlorobenzene
GC/MS	EPA 8260B/C; EPA 524.2	1, 2, 4-Trimethylbenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C; EPA 524.2	1, 2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/C; EPA 524.2	1, 2-Dibromoethane (EDB)
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 2-Dichlorobenzene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 2-Dichloroethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 2-Dichloropropane
GC/MS	EPA 8260B/C	1,3,5-Trichlorobenzene
GC/MS	EPA 8260B/C; EPA 524.2	1, 3, 5-Trimethylbenzene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 3-Dichlorobenzene
GC/MS	EPA 8260B/C; EPA 524.2	1, 3-Dichloropropane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	1, 4-Dichlorobenzene
GC/MS	EPA 8260B/C	1, 4-Dioxane
GC/MS	EPA 8260B/C	1-Chlorohexane
GC/MS	EPA 8260B/C; EPA 524.2	2, 2-Dichloropropane
GC/MS	EPA 8260B/C; EPA 524.2	2-Butanone
GC/MS	EPA 624; EPA 8260B/C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260B/C; EPA 524.2	2-Chlorotoluene
GC/MS	EPA 8260B/C; EPA 524.2	2-Hexanone
GC/MS	EPA 8260B/C; EPA 524.2	4-Chlorotoluene
GC/MS	EPA 8260B/C; EPA 524.2	4-Methyl-2-pentanone
GC/MS	EPA 8260B/C; EPA 524.2	Acetone
GC/MS	EPA 8260B/C	Acetonitrile
GC/MS	EPA 624; EPA 8260B/C	Acrolein
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Acrylonitrile
GC/MS	EPA 8260B/C; EPA 524.2	Allyl chloride
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Benzene
GC/MS	EPA 8260B/C	Benzyl chloride
GC/MS	EPA 8260B/C; EPA 524.2	Bromobenzene
GC/MS	EPA 8260B/C; EPA 524.2	Bromochloromethane

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Bromodichloromethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Bromoform
GC/MS	EPA 8260B/C; EPA 524.2	Carbon disulfide
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Carbon tetrachloride
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Chlorobenzene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Chloroethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Chloroform
GC/MS	EPA 8260B/C	Chloroprene
GC/MS	EPA 8260B/C; EPA 524.2	cis-1, 2-Dichloroethene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	cis-1, 3-Dichloropropene
GC/MS	EPA 8260B/C	Cis-1,4-Dichloro-2-butene
GC/MS	EPA 8260B/C	Cyclohexane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Dibromochloromethane
GC/MS	EPA 8260B/C; EPA 524.2	Dibromomethane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Dichlorodifluoromethane
GC/MS	EPA 8260B/C; EPA 524.2	Diethyl ether
GC/MS	EPA 8260B/C	Di-isopropylether
GC/MS	EPA 8260B/C; EPA 524.2	Ethyl methacrylate
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Ethylbenzene
GC/MS	EPA 8260B/C	Ethyl-t-butylether
GC/MS	EPA 8260B/C; EPA 524.2	Hexachlorobutadiene
GC/MS	EPA 8260B/C	Iodomethane
GC/MS	EPA 8260B/C	Isobutyl alcohol
GC/MS	EPA 8260B/C	Isopropyl alcohol
GC/MS	EPA 8260B/C; EPA 524.2	Isopropyl benzene
GC/MS	EPA 8260B/C; EPA 524.2	m p-xylenes
GC/MS	EPA 8260B/C	Methyl acetate

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C; EPA 524.2	Methacrylonitrile
GC/MS	EPA 624 / 8260B,C	Methyl bromide (Bromomethane)
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Methyl chloride (Chloromethane)
GC/MS	EPA 8260B/C; EPA 524.2	Methyl methacrylate
GC/MS	EPA 8260B/C; EPA 524.2	Methyl tert-butyl ether
GC/MS	EPA 8260B/C	Methylcyclohexane
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Methylene chloride
GC/MS	EPA 8260B/C; EPA 524.2	Naphthalene
GC/MS	EPA 8260B/C; EPA 524.2	n-Butylbenzene
GC/MS	EPA 8260B/C; EPA 524.2	n-Propylbenzene
GC/MS	EPA 8260B/C; EPA 524.2	o-Xylene
GC/MS	EPA 8260B/C	Pentachloroethane
GC/MS	EPA 8260B/C; EPA 524.2	p-Isopropyltoluene
GC/MS	EPA 8260B/C; EPA 524.2	Propionitrile
GC/MS	EPA 8260B/C; EPA 524.2	sec-butylbenzene
GC/MS	EPA 8260B/C; EPA 524.2	Styrene
GC/MS	EPA 8260B/C	t-Amylmethylether
GC/MS	EPA 8260B/C; EPA 524.2	tert-Butyl alcohol
GC/MS	EPA 8260B/C	tert-Butylbenzene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Tetrachloroethene (Perchloroethylene)
GC/MS	EPA 8260B/C; EPA 524.2	Tetrahydrofuran
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Toluene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	trans-1, 2-Dichloroethylene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	trans-1, 3-Dichloropropylene
GC/MS	EPA 8260B/C; EPA 524.2	trans-1, 4-Dichloro-2-butuene
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Trichloroethene (Trichloroethylene)
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Trichlorofluoromethane
GC/MS	EPA 8260B/C	Vinyl acetate

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 624; EPA 8260B/C; EPA 524.2	Vinyl chloride
GC/MS	EPA 624 / 8260B,C	Xylene
GC/MS	EPA 8260B/C SIM	1,1,1,2-Tetrachloroethane
GC/MS	8260B, C SIM	1,1,1-Trichloroethane
GC/MS	EPA 8260B/C SIM	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/C SIM	1, 1, 2-Trichloroethane
GC/MS	EPA 8260B/C SIM	1,2,3-Trichloropropane
GC/MS	EPA 8260B/C SIM	1,1-Dichloroethane
GC/MS	EPA 8260B/C SIM	1,1-Dichloroethene
GC/MS	EPA 8260B/C SIM	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/C SIM	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/C SIM	1,2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/C SIM	1,2-Dibromoethane
GC/MS	EPA 8260B/C SIM	1,2-Dichlorobenzene
GC/MS	EPA 8260B/C SIM	1,2-Dichloroethane
GC/MS	EPA 8260B/C SIM	1,2-Dichloropropane
GC/MS	EPA 8260B/C SIM	1,3-Dichlorobenzene
GC/MS	EPA 8260B/C SIM	1,3-Dichloropropane
GC/MS	EPA 8260B/C SIM	1,4-Dichlorobenzene
GC/MS	EPA 8260B/C SIM	2-Hexanone
GC/MS	EPA 8260B/C SIM	4-Methyl-2-pentanone
GC/MS	EPA 8260B/C SIM	Benzene
GC/MS	EPA 8260B/C SIM	Bromodichloromethane
GC/MS	EPA 8260B/C SIM	Carbon Tetrachloride
GC/MS	EPA 8260B/C SIM	Chloroform
GC/MS	EPA 8260B/C SIM	Chloromethane
GC/MS	EPA 8260B/C SIM	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/C SIM	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/C SIM	Dibromochloromethane
GC/MS	EPA 8260B/C SIM	Ethylbenzene
GC/MS	EPA 8260B/C SIM	Isopropylbenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C SIM	Hexachlorobutadiene
GC/MS	EPA 8260B/C SIM	Methylcyclohexane
GC/MS	EPA 8260B/C SIM	m,p-Xylene
GC/MS	EPA 8260B/C SIM	o-Xylene
GC/MS	EPA 8260B/C SIM	Tetrachloroethene
GC/MS	EPA 8260B/C SIM	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/C SIM	Trans-1,3-Dichloropropene
GC/MS	EPA 8260B/C SIM	Trichloroethene
GC/MS	EPA 8260B/C SIM	Trichlorofluoromethane
GC/MS	EPA 8260B/C SIM	Vinyl Chloride
GC/MS	EPA 8260B/C SIM	Xylenes (total)
GC/MS	EPA 8270C/D	1, 2, 4, 5-Tetrachlorobenzene
GC/MS	EPA 625; EPA 8270C/D	1, 2, 4-Trichlorobenzene
GC/MS	EPA 625; EPA 8270C/D	1, 2-Dichlorobenzene
GC/MS	EPA 8270C/D	1, 2-Diphenylhydrazine
GC/MS	EPA 8270C/D	1, 3, 5-Trinitrobenzene
GC/MS	EPA 625; EPA 8270C/D	1, 3-Dichlorobenzene
GC/MS	EPA 8270C/D	1, 3-Dinitrobenzene
GC/MS	EPA 625; EPA 8270C/D	1, 4-Dichlorobenzene
GC/MS	EPA 8270C/D	1, 4-Dioxane
GC/MS	EPA 8270C/D	1, 4-Naphthoquinone
GC/MS	EPA 8270C/D	1, 4-Phenylenediamine
GC/MS	EPA 8270C/D	1-Chloronaphthalene
GC/MS	EPA 8270C/D	1-Methylnaphthalene
GC/MS	EPA 8270C/D	1-Naphthylamine
GC/MS	EPA 8270C/D	2, 3, 4, 6-Tetrachlorophenol
GC/MS	EPA 8270C/D	2, 4, 5-Trochlorophenol
GC/MS	EPA 625; EPA 8270C/D	2, 4, 6-Trichlorophenol
GC/MS	EPA 625; EPA 8270C/D	2, 4-Dichlorophenol
GC/MS	EPA 625; EPA 8270C/D	2, 4-Dimethylphenol
GC/MS	EPA 625; EPA 8270C/D	2, 4-Dinitrophenol

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 625; EPA 8270C/D	2, 4-Dinitrotoluene (2, 4-DNT)
GC/MS	EPA 8270C/D	2, 6-Dichlorophenol
GC/MS	EPA 625; EPA 8270C/D	2, 6-Dinitrotoluene (2, 6-DNT)
GC/MS	EPA 8270C/D	2-Acetylaminofluorene
GC/MS	EPA 625; EPA 8270C/D	2-Chloronaphthalene
GC/MS	EPA 625; EPA 8270C/D	2-Chlorophenol
GC/MS	EPA 625; EPA 8270C/D	2-Methyl-4 6-dinitrophenol
GC/MS	EPA 8270C/D	2-Methylnaphthalene
GC/MS	EPA 8270C/D	2-Methylphenol
GC/MS	EPA 8270C/D	2-Naphthylamine
GC/MS	EPA 8270C/D	2-Nitroaniline
GC/MS	EPA 625; EPA 8270C/D	2-Nitrophenol
GC/MS	EPA 8270C/D	2-Picoline
GC/MS	EPA 8270C/D	3-Methylcholanthrene
GC/MS	EPA 8270C/D	3-Nitroaniline
GC/MS	EPA 8270C/D	4-Aminobiphenyl
GC/MS	EPA 625; EPA 8270C/D	4-Bromophenyl phenyl ether
GC/MS	EPA 625; EPA 8270C/D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/D	4-Chloroaniline
GC/MS	EPA 625; EPA 8270C/D	4-Chlorophenyl phenylether
GC/MS	EPA 8270C/D	4-Dimethyl aminoazobenzene
GC/MS	EPA 8270C/D	3, 4-Methylphenol
GC/MS	EPA 8270C/D	4-Nitroaniline
GC/MS	EPA 625; EPA 8270C/D	4-Nitrophenol
GC/MS	EPA 8270C/D	4-Nitroquinoline-1-oxide
GC/MS	EPA 8270C/D	5-Nitro-o-toluidine
GC/MS	EPA 8270C/D	7, 12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270C/D	a a-Dimethylphenethylamine
GC/MS	EPA 625; EPA 8270C/D	Acenaphthene
GC/MS	EPA 625; EPA 8270C/D	Acenaphthylene
GC/MS	EPA 8270C/D	Acetophenone

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	Aniline
GC/MS	EPA 625; EPA 8270C/D	Anthracene
GC/MS	EPA 8270C/D	Aramite
GC/MS	EPA 8270C/D	Atrazine
GC/MS	EPA 8270C/D	Azobenzene
GC/MS	EPA 8270C/D	Benzaldehyde
GC/MS	EPA 625; EPA 8270C/D	Benzidine
GC/MS	EPA 625; EPA 8270C/D	Benzo(a)anthracene
GC/MS	EPA 625; EPA 8270C/D	Benzo(a)pyrene
GC/MS	EPA 625; EPA 8270C/D	Benzo(b)fluoranthene
GC/MS	EPA 625; EPA 8270C/D	Benzo(g h i)perylene
GC/MS	EPA 625; EPA 8270C/D	Benzo(k)fluoranthene
GC/MS	EPA 8270C/D	Benzoic Acid
GC/MS	EPA 8270C/D	Benzyl alcohol
GC/MS	EPA 8270C/D	1,1-Biphenyl
GC/MS	EPA 625; EPA 8270C/D	bis(2-Chloroethoxy)methane
GC/MS	EPA 625; EPA 8270C/D	bis(2-Chloroethyl) ether
GC/MS	EPA 625; EPA 8270C/D	bis(2-Chloroisopropyl) ether (2, 2`-Oxybis(1-chloropropane)
GC/MS	EPA 625; EPA 8270C/D	bis(2-Ethylhexyl)adipate
GC/MS	EPA 625; EPA 8270C/D	bis(2-Ethylhexyl) phthalate (DEHP)
GC/MS	EPA 625; EPA 8270C/D	Butyl benzyl phthalate
GC/MS	EPA 8270C/D	Caprolactam
GC/MS	EPA 8270C/D	Carbazole
GC/MS	EPA 8270C/D	Chlorobenzilate
GC/MS	EPA 625; EPA 8270C/D	Chrysene
GC/MS	EPA 8270C/D	Diallate
GC/MS	EPA 8270C/D	Dibenzo(a,j)acridine
GC/MS	EPA 625; EPA 8270C/D	Dibenz(a h)anthracene
GC/MS	EPA 8270C/D	Dibenzofuran
GC/MS	EPA 8270C/D	Diethyladipate
GC/MS	EPA 625; EPA 8270C/D	Diethyl phthalate

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	Dimethoate
GC/MS	EPA 625; EPA 8270C/D	Dimethyl phthalate
GC/MS	EPA 625; EPA 8270C/D	Di-n-butyl phthalate
GC/MS	EPA 625; EPA 8270C/D	Di-n-octyl phthalate
GC/MS	EPA 8270C/D	Dinoseb
GC/MS	EPA 8270C/D	Disulfoton
GC/MS	EPA 8270C/D	Ethyl methanesulfonate
GC/MS	EPA 8270C/D	Ethyl parathion
GC/MS	EPA 8270C/D	Ethyl methacrylate
GC/MS	EPA 8270C/D	Famfur
GC/MS	EPA 625; EPA 8270C/D	Fluoranthene
GC/MS	EPA 625; EPA 8270C/D	Fluorene
GC/MS	EPA 625; EPA 8270C/D	Hexachlorobenzene
GC/MS	EPA 625; EPA 8270C/D	Hexachlorobutadiene
GC/MS	EPA 625; EPA 8270C/D	Hexachlorocyclopentadiene
GC/MS	EPA 625; EPA 8270C/D	Hexachloroethane
GC/MS	EPA 8270C/D	Hexachlorophene
GC/MS	EPA 8270C/D	Hexachloropropene
GC/MS	EPA 625; EPA 8270C/D	Indeno(1, 2, 3-cd)pyrene
GC/MS	EPA 8270C/D	Isodrin
GC/MS	EPA 625; EPA 8270C/D	Isophorone
GC/MS	EPA 8270C/D	Isosafrole
GC/MS	EPA 8270C/D	Kepone
GC/MS	EPA 8270C/D	Methapyriline
GC/MS	EPA 8270C/D	Methy methanesulfonate
GC/MS	EPA 8270C/D	Methyl parathion
GC/MS	EPA 625; EPA 8270C/D	Naphthalene
GC/MS	EPA 625; EPA 8270C/D	Nitrobenzene
GC/MS	EPA 8270C/D	Nitroquinoline-1-oxide
GC/MS	EPA 8270C/D	n-Nitrosodiethylamine
GC/MS	EPA 625; EPA 8270C/D	n-Nitrosodimethylamine

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	n-Nitroso-di-n-butylamine
GC/MS	EPA 625; EPA 8270C/D	n-Nitrosodi-n-propylamine
GC/MS	EPA 625; EPA 8270C/D	n-Nitrosodiphenylamine
GC/MS	EPA 8270C/D	n-Nitrosomethylethylamine
GC/MS	EPA 8270C/D	n-Nitrosomorpholine
GC/MS	EPA 8270C/D	n-Nitrosopiperidine
GC/MS	EPA 8270C/D	n-Nitrosopyrrolidine
GC/MS	EPA 8270C/D	O,O,O-Triethyl phosphorothioate
GC/MS	EPA 8270C/D	o,o-Diethyl o-2pyrazinyl phosphorothioate
GC/MS	EPA 8270C/D	o-Toluidine
GC/MS	EPA 8270C/D	Pentachlorobenzene
GC/MS	EPA 8270C/D	Pentachloronitrobenzene
GC/MS	EPA 625; EPA 8270C/D	Pentachlorophenol
GC/MS	EPA 8270C/D	Phenacetin
GC/MS	EPA 625; EPA 8270C/D	Phenanthrene
GC/MS	EPA 625; EPA 8270C/D	Phenol
GC/MS	EPA 8270C/D	Phorate
GC/MS	EPA 8270C/D	Pronamide
GC/MS	EPA 625; EPA 8270C/D	Pyrene
GC/MS	EPA 8270C/D	Pyridine
GC/MS	EPA 8270C/D	Safrole
GC/MS	EPA 8270C/D	Sulfotepp
GC/MS	EPA 8270C/D	Thionazin
GC/MS	EPA 625; EPA 8270C/D	3, 3’-Dichlorobenzidine
GC/MS	EPA 8270C/D	3, 3’-Dimethylbenzidine
GC/MS	EPA 8270C/D SIM	1,1'-Biphenyl
GC/MS	EPA 8270C/D SIM	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/D SIM	1,4-Dioxane
GC/MS	EPA 8270C/D SIM	1-Methylnaphthalene
GC/MS	EPA 8270C/D SIM	2,2'-Oxybis(1-chloropropane
GC/MS	EPA 8270C/D SIM	2,3,4,6-Tetrachlorophenol

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D SIM	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/D SIM	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/D SIM	2,4-Dichlorophenol
GC/MS	EPA 8270C/D SIM	2,4-Dimethylphenol
GC/MS	EPA 8270C/D SIM	2,4-Dinitrophenol
GC/MS	EPA 8270C/D SIM	2,4-Dinitrotoluene
GC/MS	EPA 8270C/D SIM	2,6-Dinitrotoluene
GC/MS	EPA 8270C/D SIM	2-Chloronaphthalene
GC/MS	EPA 8270C/D SIM	2-Chlorophenol
GC/MS	EPA 8270C/D SIM	2-Methylnaphthalene
GC/MS	EPA 8270C/D SIM	2-Methylphenol
GC/MS	EPA 8270C/D SIM	2-Nitroaniline
GC/MS	EPA 8270C/D SIM	2-Nitrophenol
GC/MS	EPA 8270C/D SIM	3&4-Methylphenol
GC/MS	EPA 8270C/D SIM	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/D SIM	3-Nitroaniline
GC/MS	EPA 8270C/D SIM	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/D SIM	4-Bromophenyl-phenylether
GC/MS	EPA 8270C/D SIM	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/D SIM	4-Chloroaniline
GC/MS	EPA 8270C/D SIM	4-Chlorophenyl-phenylether
GC/MS	EPA 8270C/D SIM	4-Nitroaniline
GC/MS	EPA 8270C/D SIM	4-Nitrophenol
GC/MS	EPA 8270C/D SIM	Acenaphthene
GC/MS	EPA 8270C/D SIM	Acenaphthylene
GC/MS	EPA 8270C/D SIM	Acetophenone
GC/MS	EPA 8270C/D SIM	Anthracene
GC/MS	EPA 8270C/D SIM	Atrazine
GC/MS	EPA 8270C/D SIM	Benzaldehyde
GC/MS	EPA 8270C/D SIM	Benzo(a)anthracene
GC/MS	EPA 8270C/D SIM	Benzo(a)pyrene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D SIM	Benzo(b)fluoranthene
GC/MS	EPA 8270C/D SIM	Benzo(g,h,i)perylene
GC/MS	EPA 8270C/D SIM	Benzo(k)fluoranthene
GC/MS	EPA 8270C/D SIM	Bis(2-chloroethoxy)methane
GC/MS	EPA 8270C/D SIM	Bis(2-chloroethyl)ether
GC/MS	EPA 8270C/D SIM	Bis(2-ethylhexyl)phthalate
GC/MS	EPA 8270C/D SIM	Butylbenzylphthalate
GC/MS	EPA 8270C/D SIM	Caprolactam
GC/MS	EPA 8270C/D SIM	Carbazole
GC/MS	EPA 8270C/D SIM	Chrysene
GC/MS	EPA 8270C/D SIM	Dibenzo(a,h)anthracene
GC/MS	EPA 8270C/D SIM	Dibenzofuran
GC/MS	EPA 8270C/D SIM	Diethylphthalate
GC/MS	EPA 8270C/D SIM	Dimethyl phthalate
GC/MS	EPA 8270C/D SIM	Di-n-butylphthalate
GC/MS	EPA 8270C/D SIM	Di-n-octylphthalate
GC/MS	EPA 8270C/D SIM	Fluoranthene
GC/MS	EPA 8270C/D SIM	Fluorene
GC/MS	EPA 8270C/D SIM	Hexachlorobenzene
GC/MS	EPA 8270C/D SIM	Hexachlorobutadiene
GC/MS	EPA 8270C/D SIM	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/D SIM	Hexachloroethane
GC/MS	EPA 8270C/D SIM	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270C/D SIM	Isophorone
GC/MS	EPA 8270C/D SIM	Naphthalene
GC/MS	EPA 8270C/D SIM	Nitrobenzene
GC/MS	EPA 8270C/D SIM	n-Nitroso-di-n-propylamine
GC/MS	EPA 8270C/D SIM	n-Nitrosodiphenylamine
GC/MS	EPA 8270C/D SIM	Pentachlorophenol
GC/MS	EPA 8270C/D SIM	Phenanthrene
GC/MS	EPA 8270C/D SIM	Phenol

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D SIM	Pyrene
HPLC/UV	EPA 8330A/B	1, 3, 5-Trinitrobenzene
HPLC/UV	EPA 8330A/B	1, 3-Dinitrobenzene
HPLC/UV	EPA 8330A/B	2, 4, 6-Trinitrotoluene
HPLC/UV	EPA 8330A/B	2, 4-Dinitrotoluene
HPLC/UV	EPA 8330A/B	2, 6-Dinitrotoluene
HPLC/UV	EPA 8330A/B	2-Amino-4, 6 -Dinitrotoluene
HPLC/UV	EPA 8330A/B	2-Nitrotoluene
HPLC/UV	EPA 8330A/B	3-Nitrotoluene
HPLC/UV	EPA 8330A/B	3,5-Dinitroaniline
HPLC/UV	EPA 8330A/B	4-Amino-2, 6-Dinitrotoluene
HPLC/UV	EPA 8330A/B	4-Nitrotoluene
HPLC/UV	EPA 8330A/B	Ethylene glycol dinitrate (EGDN)
HPLC/UV	EPA 8330A/B	Hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine (RDX)
HPLC/UV	EPA 8330A/B	Nitrobenzene
HPLC/UV	EPA 8330A MOD	Nitroglycerin
HPLC/UV	EPA 8330B	Nitroglycerin
HPLC/UV	EPA 8330A/B	Octahydro-1, 3, 5, 7-tetrazocine (HMX)
HPLC/UV	EPA 8330A/B	Pentaerythritol Tetranitrate (PETN)
HPLC/UV	EPA 8330A/B	Tetryl
CVAA	EPA 245.1; EPA 7470A	Mercury
CVAF	EPA 1631E	Low Level Mercury
ICP/AES	EPA 200.7; EPA 6010B/C	Aluminum
ICP/AES	EPA 200.7; EPA 6010B/C	Antimony
ICP/AES	EPA 200.7; EPA 6010B/C	Arsenic
ICP/AES	EPA 200.7; EPA 6010B/C	Barium
ICP/AES	EPA 200.7; EPA 6010B/C	Beryllium
ICP/AES	EPA 200.7; EPA 6010B/C	Boron
ICP/AES	EPA 200.7; EPA 6010B/C	Cadmium
ICP/AES	EPA 200.7; EPA 6010B/C	Calcium
ICP/AES	EPA 200.7; EPA 6010B/C	Chromium

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP/AES	EPA 200.7; EPA 6010B/C	Cobalt
ICP/AES	EPA 200.7; EPA 6010B/C	Copper
ICP/AES	EPA 200.7; EPA 6010B/C	Iron
ICP/AES	EPA 200.7; EPA 6010B/C	Lead
ICP/AES	EPA 200.7; EPA 6010B/C	Magnesium
ICP/AES	EPA 200.7; EPA 6010B/C	Manganese
ICP/AES	EPA 200.7; EPA 6010B/C	Molybdenum
ICP/AES	EPA 200.7; EPA 6010B/C	Nickel
ICP/AES	EPA 200.7; EPA 6010B/C	Potassium
ICP/AES	EPA 200.7; EPA 6010B/C	Selenium
ICP/AES	EPA 200.7; EPA 6010B/C	Silicon
ICP/AES	EPA 200.7; EPA 6010B/C	Silver
ICP/AES	EPA 200.7; EPA 6010B/C	Sodium
ICP/AES	EPA 6010B/C	Strontium
ICP/AES	EPA 200.7; EPA 6010B/C	Thallium
ICP/AES	EPA 200.7; EPA 6010B/C	Tin
ICP/AES	EPA 200.7; EPA 6010B/C	Titanium
ICP/AES	EPA 200.7; EPA 6010B/C	Vanadium
ICP/AES	EPA 200.7; EPA 6010B/C	Zinc
ICP/MS	EPA 200.8; EPA 6020A	Aluminum
ICP/MS	EPA 200.8; EPA 6020A	Antimony
ICP/MS	EPA 200.8; EPA 6020A	Arsenic
ICP/MS	EPA 200.8; EPA 6020A	Barium
ICP/MS	EPA 200.8; EPA 6020A	Beryllium
ICP/MS	EPA 200.8; EPA 6020A	Boron
ICP/MS	EPA 200.8; EPA 6020A	Cadmium
ICP/MS	EPA 200.8; EPA 6020A	Calcium
ICP/MS	EPA 200.8; EPA 6020A	Chromium
ICP/MS	EPA 200.8; EPA 6020A	Cobalt
ICP/MS	EPA 200.8; EPA 6020A	Copper
ICP/MS	EPA 200.8; EPA 6020A	Iron

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP/MS	EPA 200.8; EPA 6020A	Lead
ICP/MS	EPA 200.8; EPA 6020A	Magnesium
ICP/MS	EPA 200.8; EPA 6020A	Manganese
ICP/MS	EPA 200.8; EPA 6020A	Molybdenum
ICP/MS	EPA 200.8; EPA 6020A	Nickel
ICP/MS	EPA 200.8; EPA 6020A	Potassium
ICP/MS	EPA 200.8; EPA 6020A	Selenium
ICP/MS	EPA 200.8; EPA 6020A	Silicon
ICP/MS	EPA 200.8; EPA 6020A	Silver
ICP/MS	EPA 200.8; EPA 6020A	Sodium
ICP/MS	EPA 6020A	Strontium
ICP/MS	EPA 200.8; EPA 6020A	Thallium
ICP/MS	EPA 200.8; EPA 6020A	Tin
ICP/MS	EPA 200.8; EPA 6020A	Titanium
ICP/MS	EPA 200.8; EPA 6020A	Tungsten
ICP/MS	EPA 200.8	Uranium
ICP/MS	EPA 200.8; EPA 6020A	Vanadium
ICP/MS	EPA 200.8; EPA 6020A	Zinc
IC	EPA 300.0; EPA 9056A	Chloride
IC	EPA 300.0; EPA 9056A	Fluoride
IC	EPA 300.0; EPA 9056A	Nitrate as N
IC	EPA 300.0; EPA 9056A	Nitrite as N
IC	EPA 300.0; EPA 9056A	Nitrate + Nitrite
IC	EPA 300.0; EPA 9056A	Orthophosphate as P
IC	EPA 300.0; EPA 9056A	Sulfate
IC	SOP CA-776	Lactic Acid
IC	SOP CA-776	Acetic Acid
IC	SOP CA-776	Propionic Acid
IC	SOP CA-776	Formic Acid
IC	SOP CA-776	Butyric Acid
IC	SOP CA-776	Pyruvic Acid

Non-Potable Water		
Technology	**Method**	**Analyte**
IC	SOP CA-776	i-Pentanoic Acid
IC	SOP CA-776	Pentanoic Acid
IC	SOP CA-776	i-Hexanoic Acid
IC	SOP CA-776	Hexanoic Acid
Titration	EPA 310.1; SM 2320B	Alkalinity
Caculation	SM 2340B	Hardness
Gravimetric	EPA 1664A; EPA 9070A	Oil and Grease, Oil and Grease with SGT
Gravimetric	SM 2540B/C/D	Solids
ISE	EPA 120.1; SM 2510B	Conductivity
ISE	SM 2520B	Practical Salinity
ISE	SM 4500F- C	Fluoride
ISE	SM 4500H+ B	pH
ISE	SM 5210B	TBOD / CBOD
Physical	EPA 1010A	Ignitability
Physical	EPA 9040C	pH
Titration	SM 2340C	Hardness
Titration	SM 4500SO_3 B	Sulfite
Titration	EPA 9034; SM 4500S^{2-} F	Sulfide
Titration	EPA SW-846 Chapter 7.3.4	Reactive Sulfide
IR	EPA 9060A; SM 5310B	Total organic carbon
Turbidimetric	EPA 180.1; SM 2130B	Turbidity
Turbidimetric	EPA 9038; ASTM 516-02	Sulfate
UV/VIS	EPA 335.4; EPA 9012B; SM 4500-CN G	Amenable cyanide
UV/VIS	EPA 350.1; SM 4500NH3 H	Ammonia as N
UV/VIS	SM 3500Fe D	Ferrous Iron
UV/VIS	EPA 351.2	Kjeldahl nitrogen - total
UV/VIS	EPA 353.2; SM 4500NO3 F	Nitrate + Nitrite
UV/VIS	EPA 353.2; SM 4500NO3 F	Nitrate as N
UV/VIS	EPA 353.2; SM 4500NO3 F	Nitrite as N
UV/VIS	EPA 365.2; SM 4500P E	Orthophosphate as P
UV/VIS	EPA 365.4	Phosphorus total

Non-Potable Water		
Technology	**Method**	**Analyte**
UV/VIS	EPA 821/R-91-100	AVS-SEM
UV/VIS	EPA 410.4	COD
UV/VIS	EPA 420.1; EPA 9065	Total Phenolics
UV/VIS	SM 4500Cl G	Total Residual Chlorine
UV/VIS	SM 5540C	MBAS
UV/VIS	EPA 7196A; SM 3500-Cr D	Chromium VI
UV/VIS	EPA 9012B; EPA 335.4	Total Cyanide
UV/VIS	EPA 9251; SM 4500Cl E	Chloride
UV/VIS	EPA SW-846 Chapter 7.3.4	Reactive Cyanide

Preparation	Method	Type
Cleanup Methods	EPA 3640A	Gel Permeation Clean-up
Cleanup Methods	EPA 3630C	Silica Gel
Cleanup Methods	EPA 3660B	Sulfur Clean-Up
Cleanup Methods	EPA 3665A	Sulfuric Acid Clean-Up
Organic Preparation	EPA 3510C	Separatory Funnel Extraction
Organic Preparation	EPA 3520C	Continuous Liquid-Liquid Extraction
Inorganic Preparation	EPA 3010A	Hotblock
Volatile Organic Preparation	EPA 5030C	Purge and Trap

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8081B	2,4`-DDD
GC/ECD	EPA 8081B	2,4`-DDE
GC/ECD	EPA 8081B	2,4`-DDT
GC/ECD	EPA 8081B	4, 4`-DDD
GC/ECD	EPA 8081B	4, 4`-DDE
GC/ECD	EPA 8081B	4, 4`-DDT
GC/ECD	EPA 8081B	Aldrin
GC/ECD	EPA 8081B	alpha-BHC (alpha-Hexachlorocyclohexane)

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8081B	Alpha-Chlordane
GC/ECD	EPA 8081B	beta-BHC (beta-Hexachlorocyclohexane)
GC/ECD	EPA 608; EPA 8081B	Chlordane (tech.)
GC/ECD	EPA 8081B	Cis-Nonachlor
GC/ECD	EPA 8081B	delta-BHC
GC/ECD	EPA 8081B	Dieldrin
GC/ECD	EPA 8081B	Endosulfan I
GC/ECD	EPA 8081B	Endosulfan II
GC/ECD	EPA 8081B	Endosulfan sulfate
GC/ECD	EPA 8081B	Endrin
GC/ECD	EPA 8081B	Endrin aldehyde
GC/ECD	EPA 8081B	Endrin Ketone
GC/ECD	EPA 8081B	gamma-BHC (Lindane gamma-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	gamma-Chlordane
GC/ECD	EPA 8081B	Heptachlor
GC/ECD	EPA 8081B	Heptachlor epoxide
GC/ECD	EPA 8081B	Hexachlorobenzene
GC/ECD	EPA 8081B	Methoxychlor
GC/ECD	EPA 8081B	Mirex
GC/ECD	EPA 8081B	Oxychlordane
GC/ECD	EPA 8081B	Toxaphene (Chlorinated camphene)
GC/ECD	EPA 8081B	Trans-Nonachlor
GC/ECD	EPA 8082A	Aroclor-1016 (PCB-1016)
GC/ECD	EPA 8082A	Aroclor-1221 (PCB-1221)
GC/ECD	EPA 8082A	Aroclor-1232 (PCB-1232)
GC/ECD	EPA 8082A	Aroclor-1242 (PCB-1242)
GC/ECD	EPA 8082A	Aroclor-1248 (PCB-1248)
GC/ECD	EPA 8082A	Aroclor-1254 (PCB-1254)
GC/ECD	EPA 8082A	Aroclor-1260 (PCB-1260)
GC/ECD	EPA 8082A MOD	Aroclor-1262 (PCB-1262)
GC/ECD	EPA 8082A MOD	Aroclor-1268 (PCB-1268)

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8082A	2, 2', 3, 3', 4, 4', 5, 5', 6-Nonachlorobiphenyl (BZ 206)
GC/ECD	EPA 8082A	2, 2', 3, 3', 4, 4', 5, 6-Octachlorobiphenyl (BZ 195)
GC/ECD	EPA 8082A	2, 2', 3, 3', 4, 4', 5-Heptachlorobiphenyl (BZ 170)
GC/ECD	EPA 8082A	2, 2', 3, 3', 4, 4'-Hexachlorobiphenyl (BZ 128)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 5, 5'-Heptachlorobiphenyl (BZ 180)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 5', 6-Heptachlorobiphenyl (BZ 183)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 5-Hexachlorobiphenyl (BZ 138)
GC/ECD	EPA 8082A	2, 2', 3, 4, 4', 6, 6'-Heptachlorobiphenyl (BZ 184)
GC/ECD	EPA 8082A	2, 2', 3, 4', 5, 5', 6-Heptachlorobiphenyl (BZ 187)
GC/ECD	EPA 8082A	2, 2', 3, 4, 5'-Pentachlorobiphenyl (BZ 87)
GC/ECD	EPA 8082A	2, 2', 3, 5'-Tetrachlorobiphenyl (BZ 44)
GC/ECD	EPA 8082A	2, 2', 4, 4', 5, 5'-Hexachlorobiphenyl (BZ 153)
GC/ECD	EPA 8082A	2, 2', 4, 5, 5'-Pentachlorobiphenyl (BZ 101)
GC/ECD	EPA 8082A	2, 2', 4, 5-Tetrachlorobiphenyl (BZ 48)
GC/ECD	EPA 8082A	2, 2', 4, 5'-Tetrachlorobiphenyl (BZ 49)
GC/ECD	EPA 8082A	2, 2', 5, 5'-Tetrachlorobiphenyl (BZ 52)
GC/ECD	EPA 8082A	2, 2', 5-Trichlorobiphenyl (BZ 18)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4', 5-Hexachlorobiphenyl (BZ 156)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4', 5'-Hexachlorobiphenyl (BZ 157)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4'-Pentachlorobiphenyl (BZ 105)
GC/ECD	EPA 8082A	2, 3, 3', 4, 4', 5, 5'-Heptachlorobiphenyl (BZ 189)
GC/ECD	EPA 8082A	2, 3', 4, 4', 5, 5'-Hexachlorobiphenyl (BZ 167)
GC/ECD	EPA 8082A	2, 3', 4, 4', 5-Pentachlorobiphenyl (BZ 118)
GC/ECD	EPA 8082A	2, 3', 4, 4',5'-Pentachlorobiphenyl (BZ 123)
GC/ECD	EPA 8082A	2, 3', 4, 4'-Tetrachlorobiphenyl (BZ 66)
GC/ECD	EPA 8082A	2, 3, 4, 4', 5-Pentachlorobiphenyl (BZ 114)
GC/ECD	EPA 8082A	2, 4, 4'-Trichlorobiphenyl (BZ 28)
GC/ECD	EPA 8082A	2, 4'-Dichlorobiphenyl (BZ 8)
GC/ECD	EPA 8082A	3, 3', 4, 4', 5, 5'-Hexachlorobiphenyl (BZ 169)
GC/ECD	EPA 8082A	3, 3', 4, 4', 5-Pentachlorobiphenyl (BZ 126)
GC/ECD	EPA 8082A	3, 3', 4, 4'-Tetrachlorobiphenyl (BZ 77)

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8082A	3, 4, 4', 5-Tetrachlorobiphenyl (BZ 81)
GC/ECD	EPA 8082A	Decachlorobiphenyl (BZ 209)
GC/ECD	EPA 8151A	2, 4, 5-T
GC/ECD	EPA 8151A	2, 4-D
GC/ECD	EPA 8151A	2, 4-DB
GC/ECD	EPA 8151A	Dalapon
GC/ECD	EPA 8151A	Dicamba
GC/ECD	EPA 8151A	Dichloroprop
GC/ECD	EPA 8151A	Dinoseb
GC/ECD	EPA 8151A	MCPA
GC/ECD	EPA 8151A	MCPP
GC/ECD	EPA 8151A	Pentachlorophenol
GC/ECD	EPA 8151A	Silvex (2, 4, 5-TP)
GC/FID	EPA 8015C/D	Diesel range organics (DRO)
GC/FID	EPA 8015C/D	Total Petroleum Hydrocarbons (TPH)
GC/FID	EPA 8015C/D	Gasoline range organics (GRO)
GC/FID/PID	MA DEP VPH	Volatile Organic Hydrocarbons
GC/FID	MA DEP EPH	Extractable Petroleum Hydrocarbons
GC/FID	MA DEP EPH EPA 3546	Extractable Petroleum Hydrocarbons Microwave Extraction Preparation
GC/FID	CT-ETPH	Total Petroleum Hydrocarbons
GC/FID	TNRCC Method 1005	Total Petroleum Hydrocarbons
GC/FID	FL-PRO	Petroleum Range Organics
GC/ECD	EPA 8011	1, 2-Dibromoethane (EDB)
GC/ECD	EPA 8011	1, 2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/C	1, 1, 1, 2-Tetrachloroethane
GC/MS	EPA 8260B/C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/C	1, 1, 1-Trichloroethane
GC/MS	EPA 8260B/C	1, 1, 2, 2-Tetrachloroethane
GC/MS	EPA 8260B/C	1, 1, 2-Trichloroethane
GC/MS	EPA 8260B/C	1, 1-Dichloroethane
GC/MS	EPA 8260B/C	1, 1-Dichloroethylene

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C	1, 1-Dichloropropene
GC/MS	EPA 8260B/C	1, 2, 3-Trichlorobenzene
GC/MS	EPA 8260B/C	1, 2, 3-Trichloropropane
GC/MS	EPA 8260B/C	1,2,3-Trimethylbenzene
GC/MS	EPA 8260B/C	1, 2, 4-Trichlorobenzene
GC/MS	EPA 8260B/C	1, 2, 4-Trimethylbenzene
GC/MS	EPA 8260B/C	1, 2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/C	1, 2-Dibromoethane
GC/MS	EPA 8260B/C	1, 2-Dichlorobenzene
GC/MS	EPA 8260B/C	1, 2-Dichloroethane
GC/MS	EPA 8260B/C	1, 2-Dichloropropane
GC/MS	EPA 8260B/C	1,3,5-Trichlorobenzene
GC/MS	EPA 8260B/C	1, 3, 5-Trimethylbenzene
GC/MS	EPA 8260B/C	1, 3-Dichlorobenzene
GC/MS	EPA 8260B/C	1, 3-Dichloropropane
GC/MS	EPA 8260B/C	1, 4-Dichlorobenzene
GC/MS	EPA 8260B/C	1, 4-Dioxane
GC/MS	EPA 8260B/C	1-Chlorohexane
GC/MS	EPA 8260B/C	2, 2-Dichloropropane
GC/MS	EPA 8260B/C	2-Butanone
GC/MS	EPA 8260B/C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260B/C	2-Chlorotoluene
GC/MS	EPA 8260B/C	2-Hexanone
GC/MS	EPA 8260B/C	4-Chlorotoluene
GC/MS	EPA 8260B/C	4-Methyl-2-pentanone
GC/MS	EPA 8260B/C	Acetone
GC/MS	EPA 8260B/C	Acetonitrile
GC/MS	EPA 8260B/C	Acrolein
GC/MS	EPA 8260B/C	Acrylonitrile
GC/MS	EPA 8260B/C	Allyl chloride
GC/MS	EPA 8260B/C	Benzene

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C	Benzyl chloride
GC/MS	EPA 8260B/C	Bromobenzene
GC/MS	EPA 8260B/C	Bromochloromethane
GC/MS	EPA 8260B/C	Bromodichloromethane
GC/MS	EPA 8260B/C	Bromoform
GC/MS	EPA 8260B/C	Carbon disulfide
GC/MS	EPA 8260B/C	Carbon tetrachloride
GC/MS	EPA 8260B/C	Chlorobenzene
GC/MS	EPA 8260B/C	Chloroethane
GC/MS	EPA 8260B/C	Chloroform
GC/MS	EPA 8260B/C	Chloroprene
GC/MS	EPA 8260B/C	cis-1, 2-Dichloroethene
GC/MS	EPA 8260B/C	cis-1, 3-Dichloropropene
GC/MS	EPA 8260B/C	cis-1,3-Dichloro-2-butene
GC/MS	EPA 8260B/C	Cyclohexane
GC/MS	EPA 8260B/C	Dibromochloromethane
GC/MS	EPA 8260B/C	Dibromomethane
GC/MS	EPA 8260B/C	Dichlorodifluoromethane
GC/MS	EPA 8260B/C	Diethyl ether
GC/MS	EPA 8260B/C	Di-isopropylether
GC/MS	EPA 8260B/C	1,2-Dibromoethane (EDB)
GC/MS	EPA 8260B/C	Ethyl methacrylate
GC/MS	EPA 8260B/C	Ethylbenzene
GC/MS	EPA 8260B/C	Ethyl-t-butylether
GC/MS	EPA 8260B/C	Hexachlorobutadiene
GC/MS	EPA 8260B/C	Iodomethane
GC/MS	EPA 8260B/C	Isobutyl alcohol
GC/MS	EPA 8260B/C	Isopropyl alcohol
GC/MS	EPA 8260B/C	Isopropyl benzene
GC/MS	EPA 8260B/C	m p-xylenes
GC/MS	EPA 8260B, C	Methyl acetate

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C	Methacrylonitrile
GC/MS	EPA 8260B/C	Methyl bromide (Bromomethane)
GC/MS	EPA 8260B/C	Methyl chloride (Chloromethane)
GC/MS	EPA 8260B/C	Methyl methacrylate
GC/MS	EPA 8260B/C	Methyl tert-butyl ether
GC/MS	EPA 8260B/C	Methylcyclohexane
GC/MS	EPA 8260B/C	Methylene chloride
GC/MS	EPA 8260B/C	Naphthalene
GC/MS	EPA 8260B/C	n-Butylbenzene
GC/MS	EPA 8260B/C	n-proplybenzene
GC/MS	EPA 8260B/C	o-Xylene
GC/MS	EPA 8260B/C	pentachloroethane
GC/MS	EPA 8260B/C	p-Isopropyltoluene
GC/MS	EPA 8260B/C	Propionitrile
GC/MS	EPA 8260B/C	sec-butylbenzene
GC/MS	EPA 8260B/C	Styrene
GC/MS	EPA 8260B/C	t-Amylmethylether
GC/MS	EPA 8260B/C	tert-Butyl alcohol
GC/MS	EPA 8260B/C	tert-Butylbenzene
GC/MS	EPA 8260B/C	Tetrachloroethylene (Perchloroethylene)
GC/MS	EPA 8260B/C	Tetrahydrofuran
GC/MS	EPA 8260B/C	Toluene
GC/MS	EPA 8260B/C	trans-1, 2-Dichloroethylene
GC/MS	EPA 8260B/C	trans-1, 3-Dichloropropylene
GC/MS	EPA 8260B/C	Trans-1, 4-Dichloro-2-butuene
GC/MS	EPA 8260B/C	Trichloroethene (Trichloroethylene)
GC/MS	EPA 8260B/C	Trichlorofluoromethane
GC/MS	EPA 8260B/C	Vinyl acetate
GC/MS	EPA 8260B/C	Vinyl chloride
GC/MS	EPA 8260B/C	Xylene
GC/MS	EPA 8260B/C SIM	1,1,1,2-Tetrachloroethane

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C SIM	1,1,1-Trichloroethane
GC/MS	EPA 8260B/C SIM	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/C SIM	1, 1, 2-Trichloroethane
GC/MS	EPA 8260B/C SIM	1,2,3-Trichloropropane
GC/MS	EPA 8260B/C SIM	1,1-Dichloroethane
GC/MS	EPA 8260B/C SIM	1,1-Dichloroethene
GC/MS	EPA 8260B/C SIM	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/C SIM	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/C SIM	1,2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/C SIM	1,2-Dibromoethane
GC/MS	EPA 8260B/C SIM	1,2-Dichlorobenzene
GC/MS	EPA 8260B/C SIM	1,2-Dichloroethane
GC/MS	EPA 8260B/C SIM	1,2-Dichloropropane
GC/MS	EPA 8260B/C SIM	1,3-Dichlorobenzene
GC/MS	EPA 8260B/C SIM	1,3-Dichloropropane
GC/MS	EPA 8260B/C SIM	1,4-Dichlorobenzene
GC/MS	EPA 8260B/C SIM	2-Hexanone
GC/MS	EPA 8260B/C SIM	4-Methyl-2-pentanone
GC/MS	EPA 8260B/C SIM	Benzene
GC/MS	EPA 8260B/C SIM	Bromodichloromethane
GC/MS	EPA 8260B/C SIM	Carbon Tetrachloride
GC/MS	EPA 8260B/C SIM	Chloroform
GC/MS	EPA 8260B/C SIM	Chloromethane
GC/MS	EPA 8260B/C SIM	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/C SIM	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/C SIM	Dibromochloromethane
GC/MS	EPA 8260B/C SIM	Ethylbenzene
GC/MS	EPA 8260B/C SIM	Isopropylbenzene
GC/MS	EPA 8260B/C SIM	Hexachlorobutadiene
GC/MS	EPA 8260B/C SIM	Methylcyclohexane
GC/MS	EPA 8260B/C SIM	m,p-Xylene

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/C SIM	o-Xylene
GC/MS	EPA 8260B/C SIM	Tetrachloroethene
GC/MS	EPA 8260B/C SIM	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/C SIM	Trans-1,3-Dichloropropene
GC/MS	EPA 8260B/C SIM	Trichloroethene
GC/MS	EPA 8260B/C SIM	Trichlorofluoromethane
GC/MS	EPA 8260B/C SIM	Vinyl Chloride
GC/MS	EPA 8260B/C SIM	Xylenes (total)
GC/MS	EPA 8270C/D	1, 2, 4, 5-Tetrachlorobenzene
GC/MS	EPA 8270C/D	1, 2, 4-Trichlorobenzene
GC/MS	EPA 8270C/D	1, 2-Dichlorobenzene
GC/MS	EPA 8270C/D	1, 2-Diphenylhydrazine
GC/MS	EPA 8270C/D	1, 3, 5-Trinitrobenzene
GC/MS	EPA 8270C/D	1, 3-Dichlorobenzene
GC/MS	EPA 8270C/D	1, 3-Dinitrobenzene
GC/MS	EPA 8270C/D	1, 4-Dichlorobenzene
GC/MS	EPA 8270C/D	1, 4-Dioxane
GC/MS	EPA 8270C/D	1, 4-Naphthoquinone
GC/MS	EPA 8270C/D	1, 4-Phenylenediamine
GC/MS	EPA 8270C/D	1,1-Biphenyl
GC/MS	EPA 8270C/D	1-Chloronaphthalene
GC/MS	EPA 8270C/D	1-Methylnaphthalene
GC/MS	EPA 8270C/D	1-Naphthylamine
GC/MS	EPA 8270C/D	2, 3, 4, 6-Tetrachlorophenol
GC/MS	EPA 8270C/D	2, 4, 5-Trochlorophenol
GC/MS	EPA 8270C/D	2, 4, 6-Trichlorophenol
GC/MS	EPA 8270C/D	2, 4-Dichlorophenol
GC/MS	EPA 8270C/D	2, 4-Dimethylphenol
GC/MS	EPA 8270C/D	2, 4-Dinitrophenol
GC/MS	EPA 8270C/D	2, 4-Dinitrotoluene (2 4-DNT)
GC/MS	EPA 8270C/D	2, 6-Dichlorophenol

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	2, 6-Dinitrotoluene (2 6-DNT)
GC/MS	EPA 8270C/D	2-Acetylaminofluorene
GC/MS	EPA 8270C/D	2-Chloronaphthalene
GC/MS	EPA 8270C/D	2-Chlorophenol
GC/MS	EPA 8270C/D	2-Methyl-4, 6-dinitrophenol
GC/MS	EPA 8270C/D	2-Methylnaphthalene
GC/MS	EPA 8270C/D	2-Methylphenol
GC/MS	EPA 8270C/D	2-Naphthylamine
GC/MS	EPA 8270C/D	2-Nitroaniline
GC/MS	EPA 8270C/D	2-Nitrophenol
GC/MS	EPA 8270C/D	2-Picoline
GC/MS	EPA 8270C/D	3, 3`-Dichlorobenzidine
GC/MS	EPA 8270C/D	3, 3'-Dimethylbenzidine
GC/MS	EPA 8270C/D	3,4-Methylphenol
GC/MS	EPA 8270C/D	3-Methylcholanthrene
GC/MS	EPA 8270C/D	3-Nitroaniline
GC/MS	EPA 8270C/D	4-Aminobiphenyl
GC/MS	EPA 8270C/D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/D	4-Chloroaniline
GC/MS	EPA 8270C/D	4-Chlorophenyl phenylether
GC/MS	EPA 8270C/D	4-Dimethyl aminoazobenzene
GC/MS	EPA 8270C/D	4-Nitroaniline
GC/MS	EPA 8270C/D	4-Nitrophenol
GC/MS	EPA 8270C/D	4-Nitroquinoline-1-oxide
GC/MS	EPA 8270C/D	5-Nitro-o-toluidine
GC/MS	EPA 8270C/D	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270C/D	a a-Dimethylphenethylamine
GC/MS	EPA 8270C/D	Acenaphthene
GC/MS	EPA 8270C/D	Acenaphthylene
GC/MS	EPA 8270C/D	Acetophenone

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	Aniline
GC/MS	EPA 8270C/D	Anthracene
GC/MS	EPA 8270C/D	Aramite
GC/MS	EPA 8270C/D	Atrazine
GC/MS	EPA 8270C/D	Azobenzene
GC/MS	EPA 8270C/D	Benzaldehyde
GC/MS	EPA 8270C/D	Benzidine
GC/MS	EPA 8270C/D	Benzo(a)anthracene
GC/MS	EPA 8270C/D	Benzo(a)pyrene
GC/MS	EPA 8270C/D	Benzo(b)fluoranthene
GC/MS	EPA 8270C/D	Benzo(g h i)perylene
GC/MS	EPA 8270C/D	Benzo(k)fluoranthene
GC/MS	EPA 8270C/D	Benzoic Acid
GC/MS	EPA 8270C/D	Benzyl alcohol
GC/MS	EPA 8270C/D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270C/D	bis(2-Chloroethyl) ether
GC/MS	EPA 8270C/D	bis(2-Chloroisopropyl) ether (2, 2`-Oxybis(1-chloropropane))
GC/MS	EPA 8270C/D	bis(2-Ethylhexyl) phthalate (DEHP)
GC/MS	EPA 8270C/D	Bis(2-Ethylhexyl)adipate
GC/MS	EPA 8270C/D	Butyl benzyl phthalate
GC/MS	EPA 8270C/D	Caprolactam
GC/MS	EPA 8270C/D	Carbazole
GC/MS	EPA 8270C/D	Chlorobenzilate
GC/MS	EPA 8270C/D	Chrysene
GC/MS	EPA 8270C/D	Diallate
GC/MS	EPA 8270C/D	Dibenz(a h)anthracene
GC/MS	EPA 8270C/D	Dibenzo(a,j)acridine
GC/MS	EPA 8270C/D	Dibenzofuran
GC/MS	EPA 8270C/D	Diethyl phthalate
GC/MS	EPA 8270C/D	Diethyladipate
GC/MS	EPA 8270C/D	Dimethoate

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	Dimethyl phthalate
GC/MS	EPA 8270C/D	Di-n-butyl phthalate
GC/MS	EPA 8270C/D	Di-n-octyl phthalate
GC/MS	EPA 8270C/D	Dinoseb
GC/MS	EPA 8270C/D	Disulfoton
GC/MS	EPA 8270C/D	Ethyl methacrylate
GC/MS	EPA 8270C/D	Ethyl methanesulfonate
GC/MS	EPA 8270C/D	Ethyl parathion
GC/MS	EPA 8270C/D	Famfur
GC/MS	EPA 8270C/D	Fluoranthene
GC/MS	EPA 8270C/D	Fluorene
GC/MS	EPA 8270C/D	Hexachlorobenzene
GC/MS	EPA 8270C/D	Hexachlorobutadiene
GC/MS	EPA 8270C/D	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/D	Hexachloroethane
GC/MS	EPA 8270C/D	Hexachlorophene
GC/MS	EPA 8270C/D	Hexachloropropene
GC/MS	EPA 8270C/D	Indeno(1, 2, 3-cd)pyrene
GC/MS	EPA 8270C/D	Isodrin
GC/MS	EPA 8270C/D	Isophorone
GC/MS	EPA 8270C/D	Isosafrole
GC/MS	EPA 8270C/D	Kepone
GC/MS	EPA 8270C/D	Methapyriline
GC/MS	EPA 8270C/D	Methyl methanesulfonate
GC/MS	EPA 8270C/D	Methyl parathion
GC/MS	EPA 8270C/D	Naphthalene
GC/MS	EPA 8270C/D	Nitrobenzene
GC/MS	EPA 8270C/D	n-Nitrosodiethylamine
GC/MS	EPA 8270C/D	n-Nitrosodimethylamine
GC/MS	EPA 8270C/D	n-Nitroso-di-n-butylamine
GC/MS	EPA 8270C/D	n-Nitrosodi-n-propylamine

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	n-Nitrosodiphenylamine
GC/MS	EPA 8270C/D	n-Nitrosomethylethylamine
GC/MS	EPA 8270C/D	n-Nitrosomorpholine
GC/MS	EPA 8270C/D	n-Nitrosopiperidine
GC/MS	EPA 8270C/D	n-Nitrosopyrrolidine
GC/MS	EPA 8270C/D	O, O, O-Triethyl phosphorothioate
GC/MS	EPA 8270C/D	o,o-Diethyl o-2-pyrazinyl phosphorothioate
GC/MS	EPA 8270C/D	o-Toluidine
GC/MS	EPA 8270C/D	Pentachlorobenzene
GC/MS	EPA 8270C/D	Pentachloronitrobenzene
GC/MS	EPA 8270C/D	Pentachlorophenol
GC/MS	EPA 8270C/D	Phenacetin
GC/MS	EPA 8270C/D	Phenanthrene
GC/MS	EPA 8270C/D	Phenol
GC/MS	EPA 8270C/D	Phorate
GC/MS	EPA 8270C/D	Pronamide
GC/MS	EPA 8270C/D	Pyrene
GC/MS	EPA 8270C/D	Pyridine
GC/MS	EPA 8270C/D	Safrole
GC/MS	EPA 8270C/D	Sulfotepp
GC/MS	EPA 8270C/D	Thionazin
GC/MS	EPA 8270C/D SIM	1,1'-Biphenyl
GC/MS	EPA 8270C/D SIM	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/D SIM	1,4-Dioxane
GC/MS	EPA 8270C/D SIM	1-Methylnaphthalene
GC/MS	EPA 8270C/D SIM	2,2'-Oxybis(1-chloropropane
GC/MS	EPA 8270C/D SIM	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/D SIM	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/D SIM	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/D SIM	2,4-Dichlorophenol
GC/MS	EPA 8270C/D SIM	2,4-Dimethylphenol

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D SIM	2,4-Dinitrophenol
GC/MS	EPA 8270C/D SIM	2,4-Dinitrotoluene
GC/MS	EPA 8270C/D SIM	2,6-Dinitrotoluene
GC/MS	EPA 8270C/D SIM	2-Chloronaphthalene
GC/MS	EPA 8270C/D SIM	2-Chlorophenol
GC/MS	EPA 8270C/D SIM	2-Methylnaphthalene
GC/MS	EPA 8270C/D SIM	2-Methylphenol
GC/MS	EPA 8270C/D SIM	2-Nitroaniline
GC/MS	EPA 8270C/D SIM	2-Nitrophenol
GC/MS	EPA 8270C/D SIM	3&4-Methylphenol
GC/MS	EPA 8270C/D SIM	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/D SIM	3-Nitroaniline
GC/MS	EPA 8270C/D SIM	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/D SIM	4-Bromophenyl-phenylether
GC/MS	EPA 8270C/D SIM	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/D SIM	4-Chloroaniline
GC/MS	EPA 8270C/D SIM	4-Chlorophenyl-phenylether
GC/MS	EPA 8270C/D SIM	4-Nitroaniline
GC/MS	EPA 8270C/D SIM	4-Nitrophenol
GC/MS	EPA 8270C/D SIM	Acenaphthene
GC/MS	EPA 8270C/D SIM	Acenaphthylene
GC/MS	EPA 8270C/D SIM	Acetophenone
GC/MS	EPA 8270C/D SIM	Anthracene
GC/MS	EPA 8270C/D SIM	Atrazine
GC/MS	EPA 8270C/D SIM	Benzaldehyde
GC/MS	EPA 8270C/D SIM	Benzo(a)anthracene
GC/MS	EPA 8270C/D SIM	Benzo(a)pyrene
GC/MS	EPA 8270C/D SIM	Benzo(b)fluoranthene
GC/MS	EPA 8270C/D SIM	Benzo(g,h,i)perylene
GC/MS	EPA 8270C/D SIM	Benzo(k)fluoranthene
GC/MS	EPA 8270C/D SIM	Bis(2-chloroethoxy)methane

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D SIM	Bis(2-chloroethyl)ether
GC/MS	EPA 8270C/D SIM	Bis(2-ethylhexyl)phthalate
GC/MS	EPA 8270C/D SIM	Butylbenzylphthalate
GC/MS	EPA 8270C/D SIM	Caprolactam
GC/MS	EPA 8270C/D SIM	Carbazole
GC/MS	EPA 8270C/D SIM	Chrysene
GC/MS	EPA 8270C/D SIM	Dibenzo(a,h)anthracene
GC/MS	EPA 8270C/D SIM	Dibenzofuran
GC/MS	EPA 8270C/D SIM	Diethylphthalate
GC/MS	EPA 8270C/D SIM	Dimethyl phthalate
GC/MS	EPA 8270C/D SIM	Di-n-butylphthalate
GC/MS	EPA 8270C/D SIM	Di-n-octylphthalate
GC/MS	EPA 8270C/D SIM	Fluoranthene
GC/MS	EPA 8270C/D SIM	Fluorene
GC/MS	EPA 8270C/D SIM	Hexachlorobenzene
GC/MS	EPA 8270C/D SIM	Hexachlorobutadiene
GC/MS	EPA 8270C/D SIM	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/D SIM	Hexachloroethane
GC/MS	EPA 8270C/D SIM	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270C/D SIM	Isophorone
GC/MS	EPA 8270C/D SIM	Naphthalene
GC/MS	EPA 8270C/D SIM	Nitrobenzene
GC/MS	EPA 8270C/D SIM	n-Nitroso-di-n-propylamine
GC/MS	EPA 8270C/D SIM	n-Nitrosodiphenylamine
GC/MS	EPA 8270C/D SIM	Pentachlorophenol
GC/MS	EPA 8270C/D SIM	Phenanthrene
GC/MS	EPA 8270C/D SIM	Phenol
GC/MS	EPA 8270C/D SIM	Pyrene
HPLC/UV	EPA 8330A	1 ,3, 5-Trinitrobenzene
HPLC/UV	EPA 8330A	1, 3-Dinitrobenzene
HPLC/UV	EPA 8330A	2, 4, 6-Trinitrotoluene

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
HPLC/UV	EPA 8330A	2, 4-Dinitrotoluene
HPLC/UV	EPA 8330A	2, 6-Dinitrotoluene
HPLC/UV	EPA 8330A	2-Amino-4, 6-dinitrotoluene
HPLC/UV	EPA 8330A	2-Nitrotoluene
HPLC/UV	EPA 8330A	3-Nitrotoluene
HPLC/UV	EPA 8330A	3,5-Dinitroaniline
HPLC/UV	EPA 8330A	4-Amino-2,6-dinitrotoluene
HPLC/UV	EPA 8330A	4-Nitrotoluene
HPLC/UV	EPA 8330A	Ethylene glycol dinitrate (EGDN)
HPLC/UV	EPA 8330A	Hexahydr-1, 3, 5-trinitro-1, 3, 5-triazine (RDX)
HPLC/UV	EPA 8330A	Nitrobenzene
HPLC/UV	EPA 8330A MOD	Nitroglycerin
HPLC/UV	EPA 8330A	Octahydro-1, 3, 5, 7-tetrazocine (HMX)
HPLC/UV	EPA 8330A	Pentaerythritol Tetranitrate (PETN)
HPLC/UV	EPA 8330A	Tetryl
HPLC/UV	8330B (W/O Soil Grinding)	1, 3, 5-Trinitrobenzene
HPLC/UV	8330B (W/O Soil Grinding)	1, 3-Dinitrobenzene
HPLC/UV	8330B (W/O Soil Grinding)	2, 4, 6-Trinitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	2, 4-Dinitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	2, 6-Dinitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	2-Amino-4, 6 –Dinitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	2-Nitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	3-Nitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	3,5-Dinitroaniline
HPLC/UV	8330B (W/O Soil Grinding)	4-Amino-2,3-Dinitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	4-Nitrotoluene
HPLC/UV	8330B (W/O Soil Grinding)	Ethylene glycol dinitrate (EGDN)
HPLC/UV	8330B (W/O Soil Grinding)	Hexahydr-1, 3, 5-trinitro-1, 3, 5-triazine (RDX)
HPLC/UV	8330B (W/O Soil Grinding)	Nitrobenzene
HPLC/UV	8330B (W/O Soil Grinding)	Nitroglycerin
HPLC/UV	8330B (W/O Soil Grinding)	Octahydro-1, 3, 5, 7-tetrazocine (HMX)

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
HPLC/UV	8330B (W/O Soil Grinding)	Pentaerythritol Tetranitrate (PETN)
HPLC/UV	8330B (W/O Soil Grinding)	Tetryl
CVAA	EPA 7471B	Mercury
CVAF	EPA 1631E	Low Level Mercury
ICP/AES	EPA 6010B/C	Aluminum
ICP/AES	EPA 6010B/C	Antimony
ICP/AES	EPA 6010B/C	Arsenic
ICP/AES	EPA 6010B/C	Barium
ICP/AES	EPA 6010B/C	Beryllium
ICP/AES	EPA 6010B/C	Boron
ICP/AES	EPA 6010B/C	Cadmium
ICP/AES	EPA 6010B/C	Calcium
ICP/AES	EPA 6010B/C	Chromium
ICP/AES	EPA 6010B/C	Cobalt
ICP/AES	EPA 6010B/C	Copper
ICP/AES	EPA 6010B/C	Iron
ICP/AES	EPA 6010B/C	Lead
ICP/AES	EPA 6010B/C	Magnesium
ICP/AES	EPA 6010B/C	Manganese
ICP/AES	EPA 6010B/C	Molybdenum
ICP/AES	EPA 6010B/C	Nickel
ICP/AES	EPA 6010B/C	Potassium
ICP/AES	EPA 6010B/C	Selenium
ICP/AES	EPA 6010B/C	Silicon
ICP/AES	EPA 6010B/C	Silver
ICP/AES	EPA 6010B/C	Sodium
ICP/AES	EPA 6010B/C	Strontium
ICP/AES	EPA 6010B/C	Thallium
ICP/AES	EPA 6010B/C	Tin
ICP/AES	EPA 6010B/C	Titanium
ICP/AES	EPA 6010B/C	Vanadium

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
ICP/AES	EPA 6010B/C	Zinc
ICP/MS	EPA 6020A	Aluminum
ICP/MS	EPA 6020A	Antimony
ICP/MS	EPA 6020A	Arsenic
ICP/MS	EPA 6020A	Barium
ICP/MS	EPA 6020A	Beryllium
ICP/MS	EPA 6020A	Boron
ICP/MS	EPA 6020A	Cadmium
ICP/MS	EPA 6020A	Calcium
ICP/MS	EPA 6020A	Chromium
ICP/MS	EPA 6020A	Cobalt
ICP/MS	EPA 6020A	Copper
ICP/MS	EPA 6020A	Iron
ICP/MS	EPA 6020A	Lead
ICP/MS	EPA 6020A	Magnesium
ICP/MS	EPA 6020A	Manganese
ICP/MS	EPA 6020A	Molybdenum
ICP/MS	EPA 6020A	Nickel
ICP/MS	EPA 6020A	Potassium
ICP/MS	EPA 6020A	Selenium
ICP/MS	EPA 6020A	Silver
ICP/MS	EPA 6020A	Sodium
ICP/MS	EPA 6020A	Strontium
ICP/MS	EPA 6020A	Thallium
ICP/MS	EPA 6020A	Tin
ICP/MS	EPA 6020A	Titanium
ICP/MS	EPA 6020A	Tungsten
ICP/MS	EPA 6020A	Vanadium
ICP/MS	EPA 6020A	Zinc
IC	EPA 9056A	Chloride
IC	EPA 9056A	Fluoride

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
IC	EPA 9056A	Nitrate as N
IC	EPA 9056A	Nitrite as N
IC	EPA 9056A	Orthophosphate
IC	EPA 9056A	Sulfate
Gravimetric	EPA 9071A; EPA 9071B	Oil and Grease, Oil and Grease with SGT
Physical	EPA 1010A	Ignitability
Physical	EPA 9045D	pH
Titration	EPA SW-846 Chapter 7.3.4	Reactive Sulfide
Titration	Walkley-Black	Total Organic Carbon
IR	Lloyd Kahn	Total organic carbon
Turbidimetric	EPA 9038; ASTM 516-02	Sulfate
UV/VIS	EPA 350.1; SM 4500NH3 H	Ammonia as N
UV/VIS	EPA 9251; SM 4500Cl E	Chloride
UV/VIS	EPA SW-846 Chapter 7.3.4	Reactive Cyanide
UV/VIS	EPA 821/R-91-100	AVS-SEM
UV/VIS	SM 3500Fe D	Ferrous Iron
Cleanup Methods	EPA 3630C	Silica Gel
UV/VIS	EPA 7196	Chromium VI
UV/VIS	EPA 7196A	Chromium VI
UV/VIS	EPA 9012B	Total cyanide
Preparation	**Method**	**Type**
Preparation	EPA 1311	Toxicity Characteristic Leaching Procedure
Preparation	EPA 1312	Synthetic Precipitation Leaching Procedure
Cleanup Methods	EPA 3660B	Sulfur Clean-up
Cleanup Methods	EPA 3620C	Florsil Clean-up
Cleanup Methods	EPA 3630C	Silica Gel Clean-up
Cleanup Methods	EPA 3640A	GPC Clean-up
Organic Preparation	EPA 3540C	Soxhlet Extraction
Organic Preparation	EPA 3545A	Pressurized Fluid Extraction
Organic Preparation	EPA 3546	Microwave Extraction Preparation for EPA 8082A, 8081B and 8270C, D

Solid and Chemical Waste		
Technology	**Method**	**Analyte**
Organic Preparation	EPA 3550C	Sonication
Inorganics Preparation	EPA 3050B	Hotblock
Inorganics Preparation	EPA 3060A	Alkaline Digestion
Volatile Organics Preparation	EPA 5035/5035A	Closed System Purge and Trap

Air		
Technology	**Method**	**Analyte**
GC/MS	EPA TO-15	Propene
GC/MS	EPA TO-15	1, 1, 1-Trichloroethane
GC/MS	EPA TO-15	1, 1, 2, 2-Tetrachloroethane
GC/MS	EPA TO-15	1, 1, 2-Trichloroethane
GC/MS	EPA TO-15	1, 1-Dichloroethane
GC/MS	EPA TO-15	1, 1-Dichloroethylene
GC/MS	EPA TO-15	1, 2, 4-Trichlorobenzene
GC/MS	EPA TO-15	1, 2, 4-Trimethylbenzene
GC/MS	EPA TO-15	1, 2-Dibromoethane (EDB)
GC/MS	EPA TO-15	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)
GC/MS	EPA TO-15	1, 2-Dichlorobenzene
GC/MS	EPA TO-15	1, 2-Dichloroethane
GC/MS	EPA TO-15	1, 2-Dichloroethenes (Total)
GC/MS	EPA TO-15	1, 2-Dichloropropane
GC/MS	EPA TO-15	1, 3, 5-Trimethylbenzene
GC/MS	EPA TO-15	1, 3-Butadiene
GC/MS	EPA TO-15	1, 3-Dichlorobenzene
GC/MS	EPA TO-15	1, 4-Dichlorobenzene
GC/MS	EPA TO-15	1,4-Difluorobenzene
GC/MS	EPA TO-15	1, 4-Dioxane
GC/MS	EPA TO-15	2-Butanone
GC/MS	EPA TO-15	2-Hexanone
GC/MS	EPA TO-15	2-Propanol

Air		
Technology	**Method**	**Analyte**
GC/MS	EPA TO-15	4-Ethyltoluene
GC/MS	EPA TO-15	4-Methyl-2-pentanone
GC/MS	EPA TO-15	Acetone
GC/MS	EPA TO-15	Acrolein
GC/MS	EPA TO-15	Benzene
GC/MS	EPA TO-15	Benzyl chloride
GC/MS	EPA TO-15	Bromochloromethane
GC/MS	EPA TO-15	Bromodichloromethane
GC/MS	EPA TO-15	Bromoform
GC/MS	EPA TO-15	Carbon disulfide
GC/MS	EPA TO-15	Carbon tetrachloride
GC/MS	EPA TO-15	Chlorobenzene
GC/MS	EPA TO-15	Chloroethane
GC/MS	EPA TO-15	Chloroform
GC/MS	EPA TO-15	Cis-1, 2-Dichloroethene
GC/MS	EPA TO-15	Cis-1, 3-Dichloropropene
GC/MS	EPA TO-15	Cyclohexane
GC/MS	EPA TO-15	Dibromochloromethane
GC/MS	EPA TO-15	Dichlorodifluoromethane (Freon 12)
GC/MS	EPA TO-15	Ethanol
GC/MS	EPA TO-15	Ethyl acetate
GC/MS	EPA TO-15	Ethylbenzene
GC/MS	EPA TO-15	Hexachlorobutadiene
GC/MS	EPA TO-15	Isopropyl alcohol
GC/MS	EPA TO-15	m, p-Xylene
GC/MS	EPA TO-15	Methyl bromide (Bromomethane)
GC/MS	EPA TO-15	Methyl chloride (Chloromethane)
GC/MS	EPA TO-15	Methyl methacrylate
GC/MS	EPA TO-15	Methyl tert-butyl ether
GC/MS	EPA TO-15	Methylene chloride
GC/MS	EPA TO-15	Naphthalene

Air		
Technology	**Method**	**Analyte**
GC/MS	EPA TO-15	n-Heptane
GC/MS	EPA TO-15	n-Hexane
GC/MS	EPA TO-15	o-Xylene
GC/MS	EPA TO-15	Styrene
GC/MS	EPA TO-15	Tetrachloroethylene (Perchloroethylene)
GC/MS	EPA TO-15	Tetrahydrofuran
GC/MS	EPA TO-15	Toluene
GC/MS	EPA TO-15	trans-1, 2-Dichloroethylene
GC/MS	EPA TO-15	trans-1, 3-Dichloropropylene
GC/MS	EPA TO-15	Trichloroethene (Trichloroethylene)
GC/MS	EPA TO-15	Trichlorofluoromethane (Freon 11)
GC/MS	EPA TO-15	1,1,2-Trichloro1,2,2-trifluoroethane (Freon 113)
GC/MS	EPA TO-15	Vinyl acetate
GC/MS	EPA TO-15	Vinyl chloride
GC/MS	EPA TO-15	Xylenes (Total)
GC/MS	MA DEP APH	Aliphatic C5-C8 range
GC/MS	MA DEP APH	Aliphatic C9-C12 range
GC/MS	MA DEP APH	Aromatic C9-C10 range
GC/MS	MA DEP APH	1,3-Butadiene
GC/MS	MA DEP APH	Benzene
GC/MS	MA DEP APH	Ethylbenzene
GC/MS	MA DEP APH	m+p-Xylene
GC/MS	MA DEP APH	Methyl tert-butyl ether
GC/MS	MA DEP APH	Naphthalene
GC/MS	MA DEP APH	o-Xylene
GC/MS	MA DEP APH	Toluene

Notes:

1) This laboratory offers commercial testing service.

Approved by: _____ Date: November 19, 2013

R. Douglas Leonard
Chief Technical Officer

Re-issued: 2/1/13 Revised: 3/13/13 Revised: 11/19/13

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APPENDIX B

ACCIDENT PREVENTION PLAN

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62470-13-D-8007
CONTRACT TASK ORDER NO. WE11

FINAL
ACCIDENT PREVENTION PLAN
SITE 1 REMOVAL ACTION
FORMER NAVAL AIR WARFARE CENTER TRENTON
EWING TOWNSHIP, NEW JERSEY

December 2015

Prepared for

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ACRONYMS AND ABBREVIATIONS

AED	automatic external defibrillator
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASTM	American Society for Testing and Materials
BEC	BRAC Environmental Coordinator
BLS	Bureau of Labor Statistics
BRAC	Base Realignment and Closure
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CIRS	Contractor Incident Reporting System
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
CSIR	Contractor Significant Incident Report
CSP	Certified Safety Professional
DCN	Design Change Notice
DOL	Department of Labor
EC	Emergency Coordinator
EHS	Environmental Health and Safety
EM	Engineer Manual
EZ	exclusion zone
°F	degrees Fahrenheit
FCR	Field Change Request
FEAD	Facility Engineering and Acquisition Division
GFCI	ground-fault circuit interrupter
HAZCOM	hazard communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
mg/kg	milligrams per kilogram
MSDS	Material Safety Data Sheet
NAVFAC MIDLANT	Mid Atlantic Naval Facilities Engineering Command
Navy	U.S. Navy
NAWC	Naval Air Warfare Center
NJDEP	New Jersey Department of Environmental Protection
NEC	National Electrical Code
NRC	National Response Center
NTR	Navy Technical Representative
NTRL	Nationally Recognized Testing Laboratory
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PID	photoionization detector
PM	Project Manager (Tetra Tech)
PPE	personal protective equipment

ppm	parts per million
PVC	Polyvinyl chloride
PWD	Public Works Department
QC	quality control
RA	removal action
RPM	Remedial Project Manager
RQ	reportable quantity
SDS	Safety Data Sheets
SHM	Safety and Health Manager
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SZ	support zone
TCE	trichloroethylene
Tt	Tetra Tech
TtEC	Tetra Tech EC, Inc.
UL	Underwriter's Laboratory
USACE	U.S. Army Corps of Engineers
VP	Vice President
ZIP	Zero Incident Performance

1.0 APPROVALS

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2.0 BACKGROUND INFORMATION

2.1 Contractor

Contractor: Tetra Tech EC, Inc. (TtEC)

2.2 Contract Number

Contract Number: N62470-13-D-8007, Task Order WE11.

2.3 Project Name

Removal Action (RA) at Site 1 at the former Naval Air Warfare Center (NAWC) Trenton, in Ewing Township, New Jersey.

2.4 Description and Site History

Tetra Tech EC, Inc. (TtEC) will conduct an RA at Site 1 at the former NAWC Trenton, in Ewing Township, New Jersey. The RA activities are being conducted to remove trichloroethylene (TCE)-contaminated soil (currently known to contain up to 10 milligrams per kilogram [mg/kg]) from around and beneath the Site 1 west end failed drainage ditch piping. Under the RA, TtEC will remove all previously identified soil and pipe, characterize, and proper dispose of the waste offsite. Following removal, post-excavation soil sampling will be performed to determine if additional remedial action is required to meet cleanup criteria. After excavation is complete, TtEC will backfill the excavation and restore the area to an open drainage ditch with a pervious paver durable interlocking paving system and other routing and connection into the existing stormwater system and perform minor grading activities. In addition, TtEC will install six 2-inch diameter piezometers immediately east of the restored ditch to determine groundwater elevation and quality.

The former NAWC Trenton tested jet engines under simulated atmospheric conditions, and other aircraft propulsion related testing. NAWC Trenton closed in 1998 and was divided into four parcels (A-D) for reuse. NAWC Trenton is adjacent to the Trenton Mercer Airport. Nassimi Realty N&H owns NAWC Trenton parcel B and is planning redevelopment of the property. Parcel B is where Site 1 is located and the additional contamination was discovered that is the subject of this RA. Figure 2-1 shows the location and layout of the site.

The elements of this APP comply with the informational requirements of the following regulations and guidance:

- Occupational Safety and Health Administration (OSHA)
  - 29 CFR 1926.65[b][4][ii]
  - OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER)
- U.S. Army Corps of Engineers (USACE)
  - USACE Safety and Health Requirements Manual, Engineer Manual (EM) 385-1-1,

(Sep 2008 consolidated August 2011)

In New Jersey, Federal OSHA maintains jurisdiction over all private sector employees.

2.5 Phases of Work Requiring Activity Hazard Analyses (AHAs)

The RA elements above will consist of several primary work tasks, each of which is addressed in an Activity Hazard Analysis (AHA) (see Section 10 and Appendix A) of this APP. AHAs will be updated or developed accordingly when a process changes, new information is obtained, or when new tasks will be performed. The AHAs are not necessarily in order for the work tasks to be performed. See Section 10.0, Table 10.1 for a list of AHAs.

The activities and tasks included in AHAs present hazards to workers. Mitigations for the hazards associated with the work are presented in this APP. All personnel involved in the tasks listed above are required to review and be familiar with the requirements of the APP and specifically, to review and sign the AHA for the task elements they will be involved with during the fieldwork.

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

TtEC is committed to providing our employees with a safe and healthful workplace. It is the goal of TtEC to continue excellent safety performance on all work that we undertake. TtEC will perform work in a manner that is consistent with our Zero Incident Performance® (ZIP) philosophy. We plan to perform the work in a manner that integrates safety and health considerations so that we eliminate risk of workers' injuries or illnesses, environmental releases/impacts, or property damage. In addition to the line and staff management functions described in this APP, each individual performing work under this contract is responsible for his/her own personal health and safety and for assisting in ensuring the health and safety of coworkers. This employee responsibility includes observing specified health and safety requirements and communicating with the designated Site Superintendent (SS) and Site Safety and Health Officer (SSHO) as appropriate, on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee's failure to adhere to the requirements of this APP, observe specified safety requirements and restrictions, or to properly use identified protective equipment may lead to injury or illness. Accordingly, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information is communicated to employees through meetings, postings, written communications, and hazard reports.

Our Corporate Safety and Health Policy Statement is included as Appendix B to this APP.

3.1 Contractor Accident Experience

Table 3-1 (in the Tables section at the end of this APP) presents safety statistics for TtEC for the last 3 calendar years, as compared to the national averages for our industry. This comparison uses data collected by the U.S. Department of Labor, Bureau of Labor Statistics (BLS) for different types of employers, segregated by North American Industry Classification System (NAICS) codes.

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

4.1 Statement of Responsibility

TtEC is ultimately responsible for the implementation of its Environmental Health and Safety (EHS) program. No person will be required or instructed to work in surroundings or under conditions that are unsafe or dangerous to his or her health. Each employee is responsible for complying with applicable safety and occupational health requirements, wearing prescribed safety and health equipment, reporting unsafe conditions/activities, preventing avoidable accidents, and working in a safe manner.

4.2 Identification and Accountability

This section identifies the roles and responsibilities of TtEC personnel and subcontractors, who are conducting field activities during the RA at the former NAWC Trenton.

4.2.1 Project Management

Line management, managers, and supervisors ensure that the project activities are executed in accordance with TtEC's EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel to support them in fulfilling this responsibility. Line managers have the responsibility to integrate loss-control principles into operations and to ensure:

- TtEC safety culture is preserved by demonstrating commitment and program involvement; safety remains a major project goal and is not subordinated to other demands.
- Project-specific continuous improvement goals and objectives are developed based on EHS events and issues and are communicated to TtEC's employees and subcontractors.
- Projects are implemented in compliance with environmental, safety, and health laws and regulations, as well as EHS program requirements.
- EHS plans are developed, approved, and implemented in accordance with TtEC's requirements.
- Personnel understand the requirements of the project's EHS plan(s) and that each individual understands his/her responsibility for plan implementation.
- Personnel have the required training and capabilities to perform the assigned tasks.
- Corporate professionals or external resources, such as private consultants, are available for project support as needed.
- Project staff members are aware of, and have access to, technical information that TtEC

maintains, various EHS databases, and online regulatory subscription services.
- Additional EHS reference books and technical information are made available to project staff upon request.
- Facilities and equipment meet TtEC and government regulations.
- Work rules are enforced.
- Inspections and incident investigations are conducted per EHS program requirements.
- Effective corrective actions are implemented in a timely manner following inspections, audits, incident investigations, etc.
- Employees, including subcontractors, are not only encouraged but also required to notify their supervisor(s) of any actual or potential health and safety hazards in the workplace and to develop safe work methods and controls to be implemented in project AHAs.
- Employees and subcontractors are assured they will be rewarded for reporting health and safety concerns (not reprimanded).
- Clients are notified of TtEC's incident reporting procedures.
- Appropriate disciplinary action is implemented by line supervision when necessary.
- Management responsibilities necessary to maintain a safe, healthful, and environmentally compliant workplace are identified in each procedure of TtEC's EHS program.

4.2.2 Project Manager (PM) – Derek Pinkham

With respect to the EHS program, it is the responsibility of the PM to:

- Ensure implementation of this APP through coordination with the Site Superintendent (SS) and Safety and Health Manager (SHM)
- Conduct quarterly inspections (when required) jointly with the SHM
- Participate in the incident investigations
- Ensure the APP has the required approvals before any site work is conducted
- Ensure the SHM and SS are informed of project scope changes that require modifications of the APP
- Assume overall project responsibility for health and safety
- Ensure adequate resources are provided to the field staff to carry out their responsibilities (as outlined in this APP)

4.2.3 Corporate SHM – Roger Margotto, CIH, CSP

The SHM will review and approve this APP and any amendments prior to their adoption. The SHM will assist with implementation of the APP and provide project support on health and safety issues. The SHM will verify field personnel training, medical surveillance, and respirator fit test requirements. The SHM will advise the SSHO and SS regarding industrial hygiene concerns, interpretation and evaluation of analytical exposure data, and other safety-related issues, as needed. Subcontractor EHS plans will be reviewed by the SHM. It is also the SHMs responsibility to:

- Provide for the development and approval of the APP
- Serve as the primary contact to review any health and safety matters that arise

- Approve revised or new safety protocols for field operations
- Approve individuals who are assigned SSHO responsibilities
- Approve the SSHO to fulfill other project roles
- Approve any revisions of this APP and its' AHAs
- Approve upgrading or downgrading of personal protective equipment (PPE)
- Assist in the investigation of incidents

4.2.4 Site Superintendent – TBD

It is the SS responsibility to:

- Ensure site personnel comply with the APP
- Coordinate with the SSHO and SHM on matters regarding site safety and health.
- Maintain control of the work area and prevent any unauthorized persons from entering controlled work zones. If the unauthorized persons refuse to leave, the field crew personnel shall cease operations and notify the local authorities who will remove these individuals.
- Halt or modify any work conditions or remove personnel from the task site if conditions are unsafe.
- Ensure all task site personnel understand and comply with all safety requirements.
- Monitor team member's performance, including safety and quality control.
- Be responsible for overall direction of on-site intrusive activities.
- Be responsible for the day-to-day work at the site.
- Be responsible for implementing and enforcing all work plans.
- Conduct daily activities such as:
  - Supervising employees in daily operations
  - Overseeing the implementation of specified levels of personal protective equipment (PPE)
  - Identifying potential problem areas and making corrective action recommendations to the PM
  - Implementing all corrective actions, and maintaining a daily log of work activities including noting any extraordinary occurrences.
- Conduct weekly safety inspections jointly with the SSHO.
- Conduct incident investigations.
- Initiate corrective actions for observed safety violations.
- Conduct daily safety meetings.
- Ensure completion of the project on schedule and within budget, in accordance with the permits and project plans.
- Ensure that appropriate change management procedures are in place.
- Ensure compliance with all environmental, health, and safety requirements, including corporate policies, programs, and procedures; OSHA construction management requirements; EM 385-1-1 requirements; and any client-specific requirements included in this plan.
- Ensure that adequate site security, appropriate for the activities being performed, is maintained.

- Implement material control requirements in accordance with Government Property Control Procedures.
- Ensure that an adequate labor force is assigned to the project with the proper training, education, experience, skills, tools, equipment, and materials to complete the tasks and minimize potential impacts to the environment.
- Act as Emergency Coordinator (EC) for all emergencies.
- Prepare and submit (electronically) the Daily Contractor Production Report to the Remedial Project Manager (RPM), the NTR/Facility Engineering and Acquisition Division (FEAD) Construction Manager), and the TtEC PM.

4.2.5 Site Safety and Health Officer – TBD

The SSHO will fulfill the duties and responsibilities as defined in corporate procedures. The SSHO will have completed the 30-hour OSHA construction safety class or equivalent. The SSHO has 5 years of construction experience and has had 24 hours of formal health and safety training in the last 4 years. The SSHO reports to the SHM and assists with the on-site implementation of TtEC EHS programs and procedures (presented in Appendix C). The SSHO helps to ensure that operations are performed in compliance with applicable client- and site-specific requirements and government regulations. The SSHO will be responsible for the following:

- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Assist the SS with implementation of the APP.
- Conduct daily EHS briefings in accordance with corporate procedures.
- Conduct daily informal inspections of the project site and recording observations in the logbook.
- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Assist with implementation of the APP.
- Conduct daily EHS briefings in accordance with corporate procedures.
- Conduct daily informal inspections of the project site and recording observations in the logbook.
- Update the Safety and Health Deficiency Log on a daily basis.
- Assist the SS with weekly health and safety inspections. Ensure corrective actions identified are being addressed and corrected.
- Exercise stop work authority when warranted by conditions, in accordance with the project plans.
- Ensure that TtEC site personnel have received required EHS regulatory and program training, in accordance with corporate procedure training.
- Support the PM and SS in accident and incident investigations.
- Function as a technical resource for all environmental, safety, loss control, and industrial hygiene issues.
- Ensure that the specific responsibilities for EHS personnel identified in the TtEC EHS programs and the EHS plan(s) are fulfilled.

- Perform on-site monitoring to determine appropriate levels and use of personal protective equipment (PPE).
- Perform site surveillances, hazard identification, and health risk analysis.
- Implement procedures and programs to eliminate risk to site personnel, including initiating changes to the plan.
- Act as EC when the SS is not immediately available.
- Implement site control measures.
- Maintain the field health and safety logbook.
- Provide summaries of field operations and progress to the SHM.

4.2.6 Field Crew Personnel – Various (TtEC, craft, and subcontractors)

Field crew personnel include the other persons entering the work site for the purpose of assisting in the completion of the project. This includes, but is not limited to, engineers, surveyors, facility representatives, TtEC management personnel, subcontractors, regulatory personnel, and site workers. It is the responsibility of field crew personnel to:

- Report any unsafe or potentially hazardous conditions to the SS.
- Maintain knowledge of the information, instructions, and emergency actions contained in this APP.
- Comply with rules, regulations, and procedures set forth in this APP and any instituted revisions.
- Initiate the Incident Report when involved in an incident/accident (if able to do so).
- Prevent admittance to work sites by unauthorized personnel (If the unauthorized persons refuse to leave, the field crew personnel will cease operations and notify the SS, who will notify the NTR/FEAD Construction Manager for guidance).
- Perform daily inspections of tools and equipment, including PPE, prior to use.
- Conduct daily operations check of electronic equipment and annotate in the team's logbook.
- Assist the SS with implementation and compliance with the APP.

4.2.7 Subcontractors and Suppliers/Vendors

TtEC directs the subcontractor's supervisor regarding the work and the manner in which the tasks are to be performed. Subcontractors are responsible for assigning specific tasks to their employees; ensuring their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, and equipment to safely complete activities in accordance with this APP and their individual EHS plans. Subcontractors will attend TtEC's daily health and safety meeting prior to starting fieldwork.

4.2.8 Competent Persons

Competent person(s) for anticipated health and safety-related issues that may arise on the project will be designated by the PM and stated by name in the AHA where a competent person is specifically required by task. If the name of the competent person is not known until after the APP

and AHAs are finalized, the name of the competent person will be added to the plan by Field Change Request (FCR) when the person is designated. Subcontractor personnel will provide competent persons as required where their tasks require a competent person. The subcontractor competent persons must also be designated by name in the AHA.

4.2.9 Pretask Safety and Health Analysis

This plan requires the preparation of an AHA for each task. This plan also requires that these task analyses are reviewed with all workers and that workers acknowledge their review of safety and health requirements for each task. Where subcontractors are used to perform certain work activities, the SS will ask the subcontractor to provide an AHA for review or the SSHO will work with the subcontractor in the preparation of the AHA. The AHA must be reviewed by the Contracting Officer's Representative (COR) and the SHM. As new activities are identified or the work environment of the task changes, new or revised AHAs are prepared by TtEC. These revisions or new AHAs will be submitted to the SHM and the COR for review.

Each worker performing tasks described in an AHA must receive training in the AHA and be allowed to make comments and suggestions regarding the AHA to ensure that all hazards are properly identified and that control measures are in place to mitigate these hazards.

4.3 Lines of Authority

An organizational chart depicting the lines of authority is included as Figure 4-1. TtEC will require that the personnel and subcontractors follow the requirements in this APP and verify that this requirement is being met.

4.3.1 Policies Regarding Noncompliance

TtEC has a discipline program that is discussed in all new employee orientations and is also written in the TtEC Project Orientation, Rules and Safety Guidelines Handbook (TtEC 2014), a booklet that is given to every company employee. Briefly, the rules implement a progressive disciplinary program. However, if at any time there is a significant compromise of safety procedures; immediate termination of an employee is allowed by the procedure. The SSHO will immediately report to the PM and SHM, observations of noncompliance in the performance of the subcontractor or workers.

4.3.2 Manager and Supervisor Accountability for Safety

TtEC EHS 1-1 of the Corporate Safety Program requires that:

"Line Management, the Project Manager, and supervisors, ensure that all company activities are executed in accordance with TtEC EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel support to help them fulfill this responsibility."

5.0 SUBCONTRACTORS AND SUPPLIERS/VENDORS

5.1 Identification of Subcontractors and Suppliers/Vendors

Subcontractors working on this project include:

- Driller – TBD
- Crane Services - TBD
- Professional Surveyor – TBD
- Laboratory – TBD
- Transportation and disposal – TBD

5.2 Means for Controlling and Coordinating Subcontractors

TtEC directs the subcontractor's supervisor on the tasks to be performed and the manner in which tasks are performed. Subcontractor supervisors are responsible for assigning specific tasks to their employees; ensuring that their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, PPE, and equipment to safely complete activities in accordance with this APP, and their individual EHS plans. Subcontractors' EHS plans are reviewed by the SSHO or the SHM.

5.3 Safety Responsibilities of Subcontractors and Suppliers/Vendors

Individuals employed by subcontractors and suppliers/vendors will receive a site-specific briefing regarding the site specific physical, chemical, or biological hazards present on the work site; required safety activities; and their individual roles and responsibilities for safety practices. While on site, all subcontractor supervisors will ensure their crews perform tasks that they are contracted to perform and that they follow at a minimum this APP and its' AHAs. The SS will observe their performance and have the contractor's supervisors ensure compliance.

Subcontractors are responsible for complying with this APP and other applicable regulations. Subcontractor personnel must receive a briefing from the SSHO prior to accessing the project work site. They must fulfill the requirements established by this APP and must acknowledge receipt of the plan and the hazard communication briefing. On-site subcontractors are responsible for providing their personnel with appropriate PPE as specified by the plan, however it is the ultimate responsibility of the SS to ensure the APP is followed. Prior to the commencement or continuation of work, subcontractor and third-party personnel have the authority to request a work area hazard assessment by the SS. Any member of the work party observing an imminent safety hazard or potentially dangerous situation will immediately suspend field activities.

Most subcontractors have their own EHS plans and/or corporate policies that are specific to their specialty services. TtEC management is responsible for ensuring that subcontractor employees follow the policies and procedures of TtEC and this APP. If subcontractors' EHS plans are more restrictive, the subcontractor supervisors must ensure that their EHS plans are also followed.

Hazards not listed in this APP, but known by the subcontractor or known to be associated with a subcontractor's specialty, must be identified and addressed prior to beginning work, both in the subcontractor's EHS plan and during the daily health and safety briefing. The contractor will inform the SSHO of these hazards and assist in the development and/or revision of AHAs.

6.0 TRAINING

The following training is required on all projects under this contract.

6.1 New Hire Training

All employees will be briefed on the APP requirements and specific work tasks they will be performing and supervised with on the job training as shown below.

6.2 On-the-Job Training

In addition to the required initial training, each employee will receive three days of directly supervised on-the-job training (i.e., close supervision during the first three days working in the field). This training will address the duties the employees are expected to perform.

6.3 Periodic Safety and Health Training

In order to remain current with respect to 30-hour Construction Safety training, the SSHO will receive 24 hours of formal health and safety training every 4 years. As mentioned, all project personnel will receive site orientation training at the start of work. This training will be repeated as necessary whenever work activities and site conditions change.

6.4 Hazardous Waste Operations Training and Refresher

Because this project is being performed on CERCLA, including Installation Restoration sites, all site workers who work within an exclusion zone and may either be exposed to chemical related hazards are required by 29 CFR 1910.120/1926.65200 to have completed 40 hours of HAZWOPER training. An 8-hour refresher course is also required on an annual basis. Supervisors such as the SS and SSHO must have completed 8 hours of relevant supervisory health and safety training and first aid/cardiopulmonary resuscitation (CPR)/bloodborne pathogen training. HAZWOPER training is identified for all workers who enter an exclusion zone on this project.

6.5 Hazard Communication Training

In accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200 and 29 CFR 1926.59), copies of material safety data sheets (MSDS) or Safety Data Sheets (SDS) for hazardous chemical materials that are used during site operations or that may be present on site will be available from the on-site SSHO. The SSHO will conduct hazard communication (HAZCOM) training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59, Engineer Manual (EM) 385-1-1 (current version), and the HAZCOM program. Training will include, but will not be limited to, all hazards or potential hazards associated with work activities and any hazardous chemical

materials brought to or found on the site. Effective December 1, 2013 all workers must have received training in the new OSHA HAZCOM standard incorporating the new labeling requirements, use of pictograms of chemical hazards, the new SDS form which is replacing the MSDS.

6.6 Site-Specific Training

Prior to commencement of field activities, the SSHO will provide site-specific orientation training on each element of this APP to all personnel assigned to the site. Site-specific training will address the activities, procedures, monitoring, and equipment for the work operations. Training will include site layout, hazards, evacuation route(s), emergency services at the site, and the HAZCOM program (see Section 6.3); and will highlight all provisions contained within the APP. This training will also allow field workers to clarify anything they do not understand and to reinforce each individual's responsibilities regarding health and safety for his or her particular activity. If additional training is required for completion of field tasks during the site work, then the SHM or SSHO will either conduct the training or manage site personnel to ensure that tasks are conducted by appropriately trained personnel.

Personnel will also be trained in the site-specific emergency response plan, including: employee alarm system; evacuation procedures, routes, meeting places, and accountability; control of fuel sources; fire extinguisher education, minor spill control and cleanup procedures; reporting requirements; and rescue operations as applicable.

6.7 First Aid and Cardiopulmonary Resuscitation

The SSHO will identify those individuals who have current first aid, automatic external defibrillator (AED), and cardiopulmonary resuscitation (CPR) training. At a minimum, two people (including the SSHO and one other person) will have current CPR/first aid certification. The names of all CPR/first aid-qualified workers will be posted on the site bulletin board in the field office and maintained in each site vehicle.

A first-aid kit meeting the requirements of OSHA and EM 385-1-1, Section 03.B.01, will be readily available at each work site by having the kit visible and ready for use. The location of each first-aid kit will be clearly marked, and kits will be protected from the weather and maintained clean. The kit must contain all the items listed in Table 3-1 of the EM 385-1-1 manual and include one pocket mouthpiece or CPR barrier and latex gloves. The kit will be inspected weekly, and items will be replaced as they are used.

6.8 Bloodborne Pathogens Training

Individuals on site who have first aid and CPR certification and who may provide first aid and/or CPR will have completed training in accordance with the TtEC Bloodborne Pathogens Program and the annual OSHA Bloodborne Pathogen Standard, 29 CFR 1910.1030.

6.9 Use of Portable Fire Extinguishers

Project personnel will receive OSHA-compliant fire extinguisher education (29 CFR 1910.157[g]) for the use of portable fire extinguishers to respond to incipient stage fires. Typically this is given during site orientation.

6.10 Hearing Protection

Users of personal hearing protection will receive OSHA hearing conservation program and hearing protector use training (29 CFR 1910.95[i],[k]). Typically this is given during site orientation.

6.11 On-Site Health and Safety Briefings

Project personnel and visitors will participate in daily on-site health and safety briefings conducted by the SS, SSHO, or designee to assist site personnel in safely conducting their work activities. Health and safety briefings will be conducted at the start of new work activities using AHAs, which are provided in Appendix A of this APP. The briefings will include information on new operations, changes in work practices, or changes in the site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements, identify performance deficiencies related to safety during daily activities or as a result of safety inspections, and review any events (near-misses, injuries, material release, etc.). Work will be stopped and a safety briefing will be conducted following any event that could compromise the safety of personnel or the environment.

6.12 Training Certificates

Copies of the required training certificates and licenses (as applicable) will be maintained on site and will be made available for government inspection upon request. Subcontractors will provide TtEC with copies upon request.

6.13 APP Acceptance Form

The form on the next page is the APP Acceptance Form to be signed by all workers entering the project site to document site specific training. Each AHA has a signature page as well.

TETRA TECH EC, Inc.	APP ACCEPTANCE FORM	
I have read and understand the policies and procedures listed in the Accident Prevention Plan. I will comply with the provisions therein.		
Print Name	**Signature**	**Date**

7.0 SAFETY AND HEALTH INSPECTIONS

Vehicle inspections will be performed daily on all site vehicles and heavy equipment by the operator in accordance with TtEC Construction Procedure (CP)-7 (Appendix C). Weekly site inspections will be completed by the SSHO and SS in accordance with TtEC Corporate Environmental, Health, and Safety (EHS) 3-3 (Appendix C). Subcontractor personnel and/or craft personnel may be asked to participate in inspections. Daily inspections on the day(s) of scheduled

field activities will be performed by the SSHO and will be noted in the site activity logbook and TtEC Field Inspection Forms. The referenced field inspection forms are included in Appendix D. If any deficiencies are identified during the inspections, they will be noted on a deficiencies log as required by EM 385-1-1, Section 01.A.12d and corrected. Deficiencies to safety devices or equipment will be corrected before use or removed from service until they are fixed.

The inspections will be tracked for follow-up action on each of the respective forms. After the performance of the quarterly SHM inspections (if required), the inspection reports are reviewed and action items are followed-up. The SHM, or his designee, may conduct an unannounced inspection of the project.

7.1 Specific Assignment of Responsibility for a Minimum Daily Job Site Safety and Health Inspection During Periods of Work Activity

Daily site safety inspections will be conducted by the SSHO during this field effort to ensure safe work areas and compliance with the APP, OSHA regulations, and EM 385-1-1 requirements.

7.2 Proof of Inspector's Training/Qualifications

The SSHO has completed the 30-hour OSHA Construction Safety Training and meets the requirements of EM 385 1-1 Section 01.A.17 in the role of SSHO. Competent persons designated for excavation, hoisting and rigging, fall protection (if required), and/or other areas of expertise will be responsible for inspections performed in their assigned roles as competent person for that task. Competent persons will be named in the AHAs.

7.2.1 Documentation Procedures

The SSHO will record any deficiencies in the on-site field logbook or in a daily safety report that is submitted with a daily report to the NTR/FEAD Construction Manager and a copy submitted daily to the SHM.

7.2.2 Deficiency Tracking System

Deficiencies will be logged as required by EM 385-1-1, Section 01.A.12d. The items noted during field audits will be communicated to the TtEC EHS managers who maintain a corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution. Results from field audits are also regularly communicated within TtEC through training and electronic means as a method of continuous program improvement.

8.0 ACCIDENT REPORTING

When an incident occurs, the SS will orally notify the PM, NTR/FEAD Construction Manager, and the SSHO immediately. The PM will notify the RPM. The SSHO will notify the SHM. If the incident is an injury requiring more than first aid or government property damages exceeding $2,000, the PM will immediately notify the COR.

8.1 Exposure Data

The SSHO calculates exposure data on a weekly basis. Labor-hours worked are obtained from hours charged to a project for payroll purposes. The SSHO also collects the number of subcontractor labor-hours worked by reviewing daily project production reports and recording the hours on those reports. The SSHO will forward the labor-hours along with the Weekly Safety Report to the SHM, who will compile the monthly total (field staff only) and report that to the COR.

8.2 Accident Investigations, Reports, and Logs

After the oral report, the SS or SSHO must complete a written-event report form within 24 hours. This form can be either prepared manually using the form found in the corporate procedure or electronically using the corporate database. Within 72 hours, a completed investigation report must be submitted. The investigation report is part of the initial written report form. These forms can be completed by persons involved in the incident, but the investigation must be completed by a supervisor and/or the SSHO. All reports will be reviewed by the PM and the SHM upon submission. Within the reporting system, corrective actions and persons responsible for those corrective actions are identified. The system requires follow-up to ensure completion of corrective actions.

In addition, the PM or the SSHO will complete, within 48 hours, a Contractor Significant Incident Report (CSIR)(see Appendix E), as required for any injury beyond first aid or for any government property damages $2,000 or greater. The SS or the SSHO will ensure that a report is prepared and the forms are completed as requested by the NTR/FEAD Construction Manager and RPM and/or the PM and SHM. In addition, all recordable injuries, near-miss incidents, high loss potential incidents, property damage incidents costing more than $500, first aid cases, and environmental spills (greater than reportable quantity) will be entered on the Tetra Tech program incident safety database (TOTAL). This database summarizes the accident/incident history of the program from the start of the contract and on a year-to-date basis.

8.3 Immediate Notification of Major Accidents

Immediate reporting of incidents is required within TtEC. In addition, the COR will be immediately notified by the PM (or a designee) of an accident (see list below) that is required to be reported by EM 385-1-1. An accident that must be reported immediately to Mid Atlantic Naval Facilities Engineering Command (NAVFAC MIDLANT) is any injury requiring more than first aid or any government property damage in excess of $2,000. For each reportable mishap described above, a verbal report will be made to the NTR/FEAD Construction Manager and RPM as soon as possible. The NTR/FEAD Construction Manager may follow up with a request for submission of the CSIR within 48 hours. The NTR/FEAD Construction Manager will initiate a report into the Navy system that will generate an e-mail to a TtEC Manager or the SSHO so that data can be made into the Contractor Incident Reporting System (CIRS). TtEC will give the NTR/FEAD Construction Manager the name and e-mail address of the PM or other designated person. The

PM will be required to access the CIRS and complete the CSIR with all available information and resubmit the updated report online to NAVFAC MIDLANT within 24 hours of receiving the link.

List of accidents or events to be immediately reported:

a. Fatal injury/illness;
b. Permanent totally disabling injury/illness;
c. Permanent partial disabling injury/illness;
d. Three or more persons hospitalized as inpatients as a result of a single occurrence; *Note: it is TtEC practice to inform our clients of any accident requiring hospitalization of our employees or subcontractors*;
e. $200,000 or greater accidental property damage or damage in an amount specified by USACE in current accident reporting regulations *(currently we report government property damage $2,000 or greater);*
f. Arc Flash Incident/Accident;
g. Three or more individuals become ill or have a medical condition which is suspected to be related to a site condition, or a hazardous or toxic agent on the site.

8.4 Notification of OSHA

If a fatal injury, in-patient hospitalization, amputation, or loss of an eye occurs, the following additional steps will be followed:

- The SHM will initiate contact with OSHA.
- The work activities on the project must be stopped for 24 hours for a fatality.
- Assist the SHM and OSHA, as directed.

For the following types of incidents, the SHM will notify OSHA:

- Work related fatalities will be reported within 8 hours.
- In-patient hospitalizations, amputations, or loss of an eye will be reported within 24 hours.

9.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1, THE SAFETY MANUAL (AS APPLICABLE)

TtEC has established written requirements for complying with regulations and implementing TtEC policy to prevent accidents and injuries. This section describes how some of these programs are implemented specifically for this project.

9.1 Layout Plans

Approval to stage materials and equipment and set up work areas and access to these areas, including but not limited to employee and contractor vehicle parking, office space and laydown areas, will be through the NTR/FEAD Construction Manager, RPM, and the Base Realignment and Closure (BRAC) Environmental Coordinator (BEC), who will negotiate property

access/timing with the property owners. Field oversight will be coordinated with the FEAD Philadelphia, Pennsylvania.

A traffic plan has been prepared as part of the Work Plan to direct trucks and equipment transportation during working hours and to minimize disturbance to local business operations and residents. A location (see Figure 9-1) within the locking gated area of the project site will be used for the laydown areas, including temporary material stockpiles and portable toilet facilities. TtEC will utilize the existing treatment facility office as a field office. No field trailer will be required. Temporary erosion controls and dust control measures will be established in construction areas as necessary and maintained throughout the project as required to minimize erosion and runoff.

Utilities, if required, will be obtained and permitted by the local public utilities district or as coordinated through the property owner. All hookups will be by a qualified and licensed electrician. TtEC will install any required temporary facilities such as telephone and internet service and will have accessible and regularly serviced portable toilet and hand washing stations set up for the project.

The work area is under private ownership and is not under control of the Navy. The work sites, equipment, and field office will be secured appropriately to minimize potential unauthorized access and tampering or theft of TtEC or government property. TtEC personnel and any subcontractors will become familiar with and obey local requirements including safety, fire, traffic, and security procedures. TtEC and subcontractor personnel will keep within the limits of the established work area and avenues of ingress and egress and will not enter any restricted areas (if any) unless required to do so and unless cleared with the property owner through the RPM, NTR/FEAD Construction Manager for such entry. TtEC will conspicuously mark any equipment and materials in possession for identification.

9.2 Emergency Response Plans

Emergency situations that may be encountered during site activities will normally be recognized by visual observation. Emergencies involving physical hazards, including fires and explosions are generally readily apparent visually. Injuries and medical emergencies, including potential exposure to hazardous materials may not always be so apparent. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in this APP and associated AHAs. Early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The SS and/or the SSHO will be responsible for performing surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Survey findings are documented by the SS and/or the SSHO in the site health and safety logbook. Site personnel are responsible for reporting situations they perceive as hazardous and correcting those hazards which are immediately correctable (e.g., removing tools or materials that may present a trip hazard).

The above actions will provide early recognition for potential emergency situations, and allow TtEC to instigate necessary control measures. However, if the SS and the SSHO determine that control measures are not sufficient to eliminate the hazard, TtEC will withdraw from the site until

the hazard can be effectively managed or eliminated and notify the appropriate response agencies whenever a hazard presents an emergency situation.

In the event of an emergency during on-site work, the primary response action by on-site personnel will be to safely assemble and evacuate to an area unaffected by the emergency and notify the SS and SSHO and render the appropriate level of response and support as is included in these plans.

Local city or county emergency services are capable of providing the most effective response to site emergencies in the event of a fire or explosion, injury or medical emergency occurs. The PM, SHM, NTR/FEAD Construction Manager, as well as the RPM and COR will be notified if these response agencies are contacted.

TtEC personnel will provide insipient emergency prevention activities such as:

- Initial (e.g., non-structural) fire-fighting support (fire extinguisher) and prevention
- Initial spill control and containment measures and prevention
- Evacuation of personnel from emergency situations
- Initial medical support for injury/illness requiring only first aid-level support

9.2.1 Procedures and Tests

9.2.1.1 Pre Emergency Planning

Based on the nature of the planned activities, emergencies resulting from physical or chemical hazards, fires, or explosions could result. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SS and/or SSHO with participation by subcontractor and craft personnel):

- Coordinating with the local emergency response personnel and local hospitals prior to the commencement of work to ensure that TtEC emergency action activities are compatible with existing emergency response procedures
- Establishing and maintaining information at the project staging areas (support zone [SZ]) for easy access in the event of an emergency
- Creating and maintaining documents on site that can be important in the event of an emergency situation, including:
  - A chemical inventory of hazardous chemicals on site
  - Corresponding MSDS or SDS
  - Completed (voluntary) medical data sheets (Appendix F) for on-site personnel
  - A entry/exit log identifying personnel on site each day
  - Site layout and emergency evacuation routes (Figure 9-1)
  - Hospital route map with directions from site and field office (Figure 9-2)
  - Emergency notification – phone numbers (Table 9-2)

At the beginning of the field work, the Emergency Coordinator (EC) will hold an emergency evacuation drill.

The drill requires evacuations of the site to the designated evacuation area. At the evacuation area, the SSHO will brief the crew on the routes to reach the hospital. The SSHO and SS will, after the drill, conduct a written debrief meeting with all participants. The SSHO will prepare a short report with recommendations for improvement of the evacuation plan.

9.2.1.2 Personnel and Lines of Authority for Emergency Situations

The SS will serve as the EC until emergency response personnel arrive on site and take command. If the SS is not present or is involved in the emergency, the SSHO is the alternate EC. If neither the SS nor SSHO are immediately present, the area or task supervisor the immediate EC and will take all necessary precautions and measures to initiate the emergency response, including notification of emergency personnel and the SS and SSHO. In the event of an emergency, personnel will safely halt operations and evacuate to a safe area and the EC will be in charge until emergency responders arrive and take command. TtEC will not provide emergency response support beyond their on-site capabilities and their training.

9.2.1.3 Emergency Signal, Assembly and Evacuation Procedures

In the event of an emergency situation such as fire or explosion, the SSHO (or a supervisor) will activate an air horn (or vehicle horn if available) with **steady long beeps** indicating the initiation of evacuation procedures. An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety, or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to, the following: severe and sudden weather conditions, fire or explosion, evidence of acute personnel overexposure to a chemical, discovery of unanticipated waste materials that are unknown, and emergencies that could also occur due to activities of other contractors, tenants, or conditions not directly related to site work.

In an emergency, personnel in affected work zones will immediately and safely stop work and assemble near the support zone (SZ), or other safe area as identified by the SS or SSHO (or immediate supervisor of that operation) where accountability of personnel will be performed. Personnel will then proceed to the designated evacuation area. The TtEC field office, located in the adjacent treatment facility office has been designated as the primary evacuation area for work activities, however if the field office is not considered to be safe, an alternate evacuation area and route may be required.

The location of assembly and evacuation areas will be upwind of the site as determined by the wind direction whenever possible. Prior to the start of site activities, and as required thereafter, the SSHO will establish and verify safe egress routes from the site to the assembly and designated evacuation areas and will coordinate this procedure with the subcontractor personnel as required. The SSHO will prepare a drawing or a map that diagrams these safe egress routes and location of assembly areas to keep this plan current. All site personnel will be briefed of the assembly and

evacuation locations and routes (including alternate locations for each work location and will be updated whenever these change).

Figure 9-1 has been included to show the site layout and location of primary evacuation area (field office). From these points, the maps showing the route to the nearest emergency hospital (Figure 9-2) **Capital Health Medical Center Hopewell, in Pennington, NJ** will be used if emergency medical services are required (See Section 9.2.6 below).

For efficient and safe site evacuation and assessment of the emergency situation, the EC will have the authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given and the order to evacuate is issued. Once the alarm has been sounded, the EC must establish that access for emergency equipment is provided and that the equipment that may cause combustion has been shut down. As soon as possible, and while the safety of the personnel is being confirmed, emergency agency notification will commence. The SS or SSHO will brief site personnel each day or when the location of either the assembly or evacuation area is revised.

If an emergency warranting evacuation occurs, the following procedures are to be initiated:

- Declare the evacuation via radio communications, cellular telephones, hand signals, voice commands, line of site communication, or vehicle/air horns as necessary.
- The following signals shall be used when communication via vehicle horn or air horn is necessary:
- Steady long beeps will be used to indicate emergency situations
- Report to the designated refuge point/assembly area.
- Once nonessential personnel are evacuated, appropriate response procedures will be enacted to control the situation.
- Describe incident precipitating the evacuation to the SS with pertinent incident details.

9.2.1.4 Emergency Equipment

The emergency equipment listed in Table 9-1 will be strategically placed and maintained on site in accessible locations where active work is taking place:

- Fire extinguishers will be maintained on site and shall be immediately available for use in the event of an emergency.
- If fuel will be transferred from portable fuel cans, they will be UL listed metal safety cans properly labeled.

Fire extinguishers will be inspected monthly to ensure:

- Sufficient charge
- No physical damage
- Tamper indicators are in place

- Up-to-date inspection tag

Site personnel will be trained in the use of the fire extinguisher as part of site-specific training.

9.2.2 Spill Plans

In addition to training, the following procedures are required to prevent and minimize releases of hazardous (or potentially hazardous) materials:

- All containers located on-site will be labeled as to contents and associated hazards.
- Hazardous materials will only be brought to the site in the minimum quantities needed to get the immediate task performed.
- A Hazardous Material Inventory as well as MSDS or SDS for hazardous materials used on-site will be kept in a binder at the field office. The Hazardous Material Inventory and MSDS/SDS are included in Appendix G, which will be updated as additional hazardous material is identified for use on the project.
- All containers will be constructed with closeable lids, which will be kept closed except when in direct use.
- Fuel containers will be metal, UL-listed and in good condition.
- Preventative maintenance will be performed on construction equipment and vehicles minimize chances for hose and other equipment failure.
- Good housekeeping operations will be followed and hazardous materials will be stored in authorized storage areas.
- Absorbent materials (e.g., sorbent pads, sorbent socks, chemical protective gloves, and bags) will be staged in the SZ for responding to potential spills that could occur during heavy equipment and refueling tasks. Spill control equipment will include, at a minimum, absorbent pads, chemical protective gloves, and disposable bags as well as tools such as shovels and brooms.
- Portable spill basins or secondary containment structures will be placed under refueling points.
- Refueling of equipment will be done by the operator who is in constant supervision of that task. Overfill prevention during refueling will be verified visually by the operator.
- Tanks (such as truck bed mounted dispensing system) will be filled only to their listed capacity (not overfilled) to allow for expansion.
- Project wastes will be kept in designated areas in closed containers, separated as required based on compatibility and managed in accordance with the Waste Management Plan.
- Personnel handling waste and hazardous materials, including selection of proper packaging, will be properly trained as required in the Waste Management Plan.
- Hazardous materials operations will not be conducted when the weather could cause significant risk to surrounding area if a spill should occur.
- Perform the transfer of any hazardous materials in a well-ventilated area.

In the event of a spill:

- The SS will notify the PM, NTR/ FEAD Construction Manager.
- The PM will notify the RPM.
- The SSHO will notify the SHM.
- Any spill quantity is reportable the NTR/ FEAD Construction Manager, RPM as well as to the PM and SHM.
- TtEC will assist the RPM with any required notification to regulatory agencies (see below) if the spill is reportable.
- In no case will TtEC report a spill to a regulatory agency without the RPM and/or COR concurrence.
- An investigation and incident report will be prepared and corrective actions identified.

The following information includes the reporting requirements and agency contact information for spills of oil or hazardous substances on this project:

New Jersey Law requires that most discharges of hazardous materials be immediately reported to the New Jersey Department of Environmental Protection (NJDEP) Hotline by calling **1-877-WARNDEP/1-877-927-6337**. Notification of an incident is then made to an emergency response duty officer who investigates and assesses the specifics of the incident to determine the threat potential to the health of the public and environment. Generally, emergency responders are deployed immediately upon a credible report of:

- A significant release, spill or discharge of a Toxic Catastrophe Prevention Act extraordinary hazardous substance.
- An incident resulting in fatalities or multiple hospitalizations directly due to a discharge of hazardous material.
- An incident resulting in significant residential evacuation and/or in a significant facility evacuation.
- An incident having interstate impact.
- Medium or major oil spills anywhere and minor spills in pristine waters.
- Numbered highway closures directly due to a release, spill or discharge of hazardous materials.
- An emergency requiring authorization for opening the New Jersey Spill Compensation Fund.

Incidents that do not meet immediate response criteria are referred to qualified county and local agencies for attention. Significant incidents such as major oil spills, chemical explosions or chemical fires with casualties or mass evacuations normally generate a joint regional response with the NJ State Police Office of Emergency Management. State support continues on-site until the emergency is terminated.

Spills that will be reported to the National Response Center (NRC) by calling **1-800-424-8802**, in addition to the above State hotline include:

- Oil spills that reach surface water
- Spills of hazardous substances if spill is a reportable quantity

9.2.3 Firefighting Plan

Workers will not fight any fires other than incipient stage fires. There will be at least one fire extinguisher (refer to Table 9-1) at each active work location. Fire extinguishers will also be located in each piece of mobile construction equipment and in the crew pickup trucks. The fire extinguishers are intended to fight only small fires that have recently occurred and can be reasonably extinguished immediately (incipient stage fires). In no case will workers attempt to fight any fire that cannot be reasonably extinguished within 30 seconds to 1 minute.

If a fire breaks out onsite, call (or designate someone) to call 911 before attempting to put out the fire (incipient stage only) and only if fighting the fire does not put anyone at further risk. Ensure a means of egress is available in the event the fire cannot be extinguished.

To use the fire extinguisher, remember the word P.A.S.S. – pull the pin, aim the nozzle at the base of the fire, squeeze the lever, and sweep side to side at the base of the fire. Workers will be given fire extinguisher training during project orientation.

Fire extinguishers will be inspected by the SSHO initially and then on a monthly basis (at a minimum). Additionally, all fire extinguishers will be inspected and serviced annually by a qualified professional. Any defective or partially-used fire extinguisher will be red-tagged and taken out of service until such time that it can be serviced. Fire extinguishers will be secured or supported when transported and in storage. During project demobilization, all fire extinguishers and other hazardous material will be properly dispositioned for further use at other TtEC projects.

In the event of a fire or explosion, contact the appropriate emergency authorities by calling 911 as specified in Table 9-1 – Emergency Contact Information. Any fire must also be reported to the NTR/ FEAD Construction Manager as well as the RPM and the SHM. The person reporting the fire is required to provide the following information to responding emergency personnel:

- His/her name
- Location of the fire
- Number of injured persons and nature of injuries, if known
- Substance(s), chemical(s), or materials involved in the fire
- Size of the fire and available fuel (estimate)
- Extent of fire
- Rate that the fire is expanding (estimate)
- Time the fire started and the time the fire was extinguished
- Any other pertinent information

9.2.4 Posting of Emergency Telephone Numbers

The list of emergency telephone numbers in Table 9-2 will be maintained at the telephone communications points in the field office.

9.2.5 Man Overboard/Abandon Ship

Not Applicable

9.2.6 Medical Support

9.2.6.1 First Aid

TtEC will ensure that a minimum of two people, the SSHO (TBD) and one other person (TBD) at a minimum, have current certifications in CPR, AED, first aid, and bloodborne pathogens. Additional qualified persons will be listed on the bulletin board in the field office. Other than rendering basic CPR and first aid, these employees are not expected to perform emergency medical duties; however, they are authorized to perform emergency rescue or other duties up to the level of their training.

For first aid injuries that are not deemed an emergency situation, appropriate care may include stabilization and transport (e.g., in site vehicle) to a nearby urgent care or occupational medicine clinic. The SSHO will evaluate the location of the nearest occupational medicine provider by contacting the clinic and determining if the clinic accepts TtEC worker's compensation insurance (provided by AIG) during mobilization for these non-emergency injuries or illnesses. Subcontractors will be instructed to do the same as per their corporate procedures. WorkCare® will be contacted immediately following appropriate first responder patient care or when the patient is transferred to emergency responder personnel in order to help assist with patient and case management and recommendations.

9.2.6.2 Medical Emergency

In the event of a medical emergency, first aid and CPR assistance will be provided by CPR, first aid trained individuals, and, if an AED is onsite, AED trained individuals. The injured party will be moved as minimally as possible if the scene remains safe for the injured or ill person and first aid responders or responding emergency personnel. If it is safe to move the person without further injury or the location may become compromised, the person will be moved to the nearest location for continued care. No person will enter an unsafe location; however, to rescue an injured worker if the scene poses a hazard that could injure or trap the would-be rescuer.

Medical emergencies, should they occur on the project site, will typically rely on emergency responders (e.g., ambulance service) for patient stabilization and transport to the hospital. In the event of a medical emergency in which actual or suspected serious injury occurs, the following procedures will be implemented:

- Survey the scene and evaluate whether the area is safe for entry.

- Render first aid, CPR, and AED (if available) as necessary.
- Obtain emergency medical services for ambulance transport to a local hospital by calling 911 from a cell phone or landline. This procedure will be followed even if there is no visible injury. Provide the following information to the emergency dispatch personnel:
  - Identify location by address (or nearest cross-street intersection), request medical assistance, and provide a name and telephone number.
- Other personnel in the work area will be evacuated to a safe distance until the EC determines that it is safe for work to resume. If there is any doubt regarding the condition of the area, work will not commence until the hazard control issues are resolved.
- Notify the PM and SHM as well as the NTR/FEAD Construction Manager. The PM and SHM will notify the RPM and COR.

The nearest emergency hospital to the former NAWC Trenton is the **Capital Health Medical Center Hopewell in Pennington, NJ.**

The location of and directions to this hospital are included in Figure 9-2, and contact numbers for both the hospitals and ambulance services, occupational medicine clinic, and WorkCare® are provided in Table 9-1. The SSHO is instructed to drive by the emergency hospital to ensure that it is accessible and available and that the most efficient routes (primary and alternate) are identified during mobilization and accurately reflected in Figure 9-2.

9.2.6.3 Medical Data Sheet

Each field team member, including subcontractors, will be asked to complete and submit a copy of the Medical Data Sheet (see Appendix F). This sheet is voluntary but encouraged and will be provided to the SSHO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention if the victim is unable to communicate. Any pertinent information regarding allergies to medications or other special conditions should be documented. This data sheet will be maintained confidential by the SSHO and information shared only to the extent necessary to support medical care of the individual.

9.3 Plan for Prevention of Alcohol and Drug Abuse

TtEC has a Drug-Free Workplace Program. All TtEC personnel, craft, and subcontractors on this project are subject to drug and alcohol testing at any time. Supervisors, managers, and the SSHO are to determine the fitness of their workers, including assessing whether their workers may be under the influence of any alcohol or drugs, including over-the-counter and prescription medications. During the initial site orientation and training conducted at the beginning of the project, all workers are reminded of the program and policies. The program and policies are also described in the Work Rules. Workers are encouraged to confidentially list their medications on a medical information form that is provided to them and retained by the SSHO. If a worker is injured or involved in an accident, the worker(s) involved may be asked to be tested. If a supervisor observes any worker who appears to be under the influence of drugs or alcohol, he/she may request testing of the worker.

9.4 Site Sanitation Plan

Sanitation facilities will be provided and maintained onsite as required in Section 2 of EM 385-1-1. TtEC will provide portable toilet and hand washing facilities at the project worksite if toilet and hand washing facilities are not readily available and accessible in existing facilities (e.g., treatment facility building). These facilities will be serviced on and as needed, but not to exceed a weekly basis, maintained in sanitary condition, and located in an accessible location to work activities.

Workers will discard all food debris and other detritus in a designated refuse container onsite. Project wastes generated from the field activities will be packaged and disposed of as specified in the Waste Management Plan following applicable federal, state, and local laws and regulations and Navy instruction after characterization. Good housekeeping procedures will be maintained throughout the duration of work and regular cleaning will be performed.

Potable water will be provided for washing hands and face and for any drinking water provided to employees. Portable drinking water containers, if provided, will be marked "drinking water" and will not be used for any other purposes or TtEC will provide bottled water from a vendor. Any outlets that dispense non-potable water will be labeled as "Caution – water unsafe for drinking, washing, or cooking."

9.5 Access and Haul Road Plan

Not applicable. TtEC will utilize existing roadways and paths to access work locations where the RA and associated tasks will be performed. If access or haul roads will be required, the PM will prepare an Access and Haul Road Plan and this will be added to this plan by FCR process.

9.6 Respiratory Protection Plan and PPE

This section outlines the respiratory protection and PPE to be used on this project as well as reasons for downgrade or upgrade.

9.6.1 Respiratory Protection Plan

The need for respiratory protection for this project is currently not anticipated to be required based on the project tasks being performed and because workers are currently not anticipated to be exposed to levels of TCE in soil above the permissible exposure limit (PEL) as calculated by a the project SHM who is a CIH. This is based on evaluation of the known levels of TCE contamination present in the soil (up to 10 mg/kg) and because the use of proper engineering controls and PPE are implemented during field tasks as outlined in this plan and the associated AHAs. The need for entry into the excavation is currently not anticipated to be required to perform the intended work tasks.

During all field activities, engineering controls such as effective dust control and the use of controlled work zones and decontamination methods, and good hygiene practices such as hand washing will be implemented and proper PPE will be used as specified in this plan and the AHAs.

If respirator use is required (e.g., if dust generation cannot be effectively controlled or should monitoring results show higher levels of volatile organics than anticipated [see monitoring plan in Section 9.7.1.1]), the SSHO, with input from the SHM, will implement TtECs Corporate Respiratory Protection Procedure, EHS 5-2 and this Respiratory Protection Plan. This plan will be updated as necessary by the SSHO or SHM. All personnel who wear a respirator will work within the requirements of this Respiratory Protection Plan, under the direct supervision of the SSHO.

All employees who wear a respirator will be trained and be fit tested. This training will occur initially, any time requirements change significantly due to process changes or changes in site-specific operations, and at least annually. Training documentation will be maintained by the SSHO and will be available upon request. Training topics will include the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- Limitations and capabilities of the respirator;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, don, doff, use, and check the seals of the respirator;
- Procedures for maintenance (including cleaning) and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of the OSHA respirator standard at 29 CFR 1910.134.

Employees assigned to use PPE, including respirators, are required to inspect the equipment before and after each use; discard any defective equipment; clean and maintain the equipment according to manufacturers' recommendations; and store their PPE in a clean, secure area on the site each day. Specific PPE inspection, cleaning, and maintenance procedures vary according to the type of equipment being used. Prior to being assigned to their jobs, employees will be informed of these equipment-specific use and maintenance procedures.

A respirator cartridge change-out schedule will be developed in consultation with the SHM based on duration of exposures, relevant safety factors applied, and manufacturer guidelines. The SSHO will maintain the change-out schedule for workers in consultation with the SHM. Workers will be informed to notify the SSHO should any signs of breakthrough be encountered (e.g., odor detected). All employees who wear a respirator will undergo medical evaluation to ensure they are fit to wear the selected respirator. This medical evaluation includes a physical examination supervised by a Board-Certified Occupational Medicine Physician. Copies of current medical evaluation and fitness to wear a respirator will be maintained onsite by the SSHO and made available upon request.

All employees who wear a respirator will be qualitatively fit tested to ensure that the selected respirators achieve a proper face piece seal. Fit testing will be performed prior to initial use of the selected respirator, whenever respirator size, make, or model is changed, and at least annually

thereafter. Records of fit testing will be maintained onsite by the SSHO and made available upon request.

9.6.2 Personal Protective Equipment

The SHM has reviewed the applicable work plans and other available information and has evaluated each major work activity to determine the appropriate level of PPE needed for the work. This evaluation included a consideration of potential hazards present; work operations to be performed; potential routes of exposure; concentrations of contaminants present or reasonably expected; characteristics, capabilities, and limitations of PPE; and, any hazards that the PPE may create or exacerbate (e.g., heat stress). Evaluation findings and recommendations are listed in the AHA matrix.

The initial and basic level of PPE selection, as required by 29 CFR 1910.132, on the project site includes a hardhat when overhead hazards are present (including when working around heavy equipment), safety glasses with side shields, safety boots that comply with American Society for Testing and Materials (ASTM) F2412 and ASTM F2413, leather work gloves (as appropriate), work clothes, ear plugs when working around power tools and heavy equipment or other sources of noise, class 2 high visibility vest when working around traffic or heavy equipment, and weather-appropriate clothing.

Reasons to upgrade level of protection:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas or vapor emission.
- Change in work task that will increase contact or potential contact with hazardous materials.
- Request of the individual performing the task.

Reasons to downgrade level of protection:

- New information indicating that the situation is less hazardous than was originally thought.
- Change in site condition that decreases the hazard.
- Change in work task that will reduce contact with hazardous materials.

When working with soil that may contain TCE, additional levels of PPE will be required (as specified in the AHAs) to keep dermal contact exposures to a minimum. Workers may be instructed to wear chemical protective gloves (Nitrile), PVC steel toe boots or boot covers, and Kleengard™ or Tyvek™ coveralls or PVC rain suit depending on contact potential under direction of the SSHO.

When handling liquids during activities where the liquids could splash the worker (e.g., pumping liquids or well purging/development), workers will wear splash goggles and a plastic face shield.

The SSHO will oversee the implementation of the PPE program onsite and will observe workers to ensure proper implementation, including proper donning/doffing and disposal. Used PPE will be managed in accordance with the Waste Management Plan. Any time PPE is modified from the plan the SHM must be contacted. Additional tasks not included in the AHA matrix will also be reviewed by the SSHO and SHM. Any additional PPE requirements will be incorporated into the APP by completing a FCR form. The FCR forms and PPE selection will require approval by the SHM.

9.7 Health Hazard Control Program

The primary health hazards associated with this project are: physical hazards associated with heavy equipment operations, including excavator or front end loader use; drilling related hazards during well/piezometer installation; fall hazards and/or cave-in hazards during excavation tasks; and handling of debris and materials which could cause struck by/caught between, ergonomic, or cuts, scrapes, and puncture hazards.

Chemical hazards include contact hazards related to handling of TCE-contaminated soils as well as use of hazardous materials onsite including fuel products for operation and maintenance of equipment.

Biological hazards may be present onsite as well and include bloodborne pathogens (e.g., if first aid or CPR are required) and the potential for contact with poisonous plants and snakes and bites or stings by insects.

TtEC will create systems and procedures to prevent and control physical, chemical, biological hazards identified through the risk analysis. The hierarchy of controls is engineering, administrative, work practice, and PPE. Use of such controls in conjunction with PPE will help reduce the hazard or exposure to the lowest practical level. The basic formula for controlling workplace hazards, in order of preference, includes:

- Eliminating the hazard from the method, material, or the facility
- Abating the hazard by limiting exposure or controlling it at its source
- Training personnel to be aware of the hazard and to follow safe work procedures to avoid it
- Prescribing PPE for protecting employees against the hazard and ensuring they not only use it, but they know how to use it correctly

Section 9.7.1 addresses chemical hazards and mitigation measures to reduce those hazards, including the monitoring strategy for this project is included in Section 9.7.1.1 below.

Section 9.7.4 addresses biological hazards (e.g., animals, poisonous plants, insects, snakes, and bloodborne pathogens).

Section 9.37 of this APP identifies and describes physical hazards and mitigation measures to reduce those hazards where otherwise not already included.

9.7.1 Chemical Hazards

The RA activities are being conducted to remove TCE-contaminated soil (currently anticipated to contain up to 10 mg/kg) from around and beneath the Site 1 west end failed drainage ditch piping. In addition, groundwater may contain low-levels of TCE. This low level of TCE does not present an exposure hazard to workers.

A variety of controls will be implemented during the work tasks to keep worker exposures below the PEL for site contaminants (when an exposure pathway exists) and to minimize the potential for the spread of contaminants, including via dusts, spills, handling of contaminated media, and off-tracking to adjacent areas as follows:

- During soil handling activities and travel on unpaved roadways, site dust control measures will be implemented when dusts are generated. If fugitive dusts are generated, the areas will be sprayed/misted with water to minimize visible dust generation as long as the spraying/misting does not lead to the creation of a hazard to workers or water accumulation or runoff.
- Whenever possible, workers will position and stage upwind of dust generation operations.
- Tarps or other covers will be placed on soil stockpiles (if any) as necessary to control dusts that could be generated and migrate off site on windy days.
- Workers will have access to and will be informed of the requirement to use hand washing stations to wash hands before taking breaks, eating, drinking, or smoking (only in designated areas).
- Workers will doff and stow any soiled PPE in a designated location and will not wear or bring dirty clothing or soiled work boots into break areas, office areas, or cab of site vehicles.
- Control zones will be established around the work areas where hazardous materials and or site contaminants are present.
- Appropriate level of decontamination (see below) of equipment and personnel will be performed when leaving contaminated areas as specified by the SSHO for these work tasks to ensure contaminants are not tracked out of controlled work areas.

Site control measures are discussed in Section 9.7.2 and personal hygiene and decontamination procedures are included in Section 9.7.3 below.

9.7.1.1 Monitoring Strategy

The SSHO will monitor the worker's breathing zone in work areas where the potential for volatile organic vapors to be present such as during excavation and handling or sampling of potentially TCE-contaminated soil and during piezometer installation using the photoionization detector (PID) function on the MultiRAE® or equivalent instrument. The PID will be equipped with a 10.6 electron volt lamp and be calibrated to isobutylene standard. The following levels will dictate the respiratory protection required for personnel working within or adjacent to the excavation where contaminated soils are present.

- Total organic vapor levels equal to or less than 10 parts per million (ppm) (not sustained) above background will be considered acceptable for requiring of no respiratory protection, with SHM concurrence.
- Total organic vapor levels greater than 10 ppm above background in short duration (or levels that are consistently above 10 ppm sustained) but less than 50 ppm will require use of full face APR. Contact SHM before use of respirators.
- Total organic vapor levels greater than 50 parts per million (ppm) above background will require use of supplied air respiratory protection (not anticipated for this project).

In addition to monitoring for organic vapors, the MultiRAE® or equivalent instrument may be used (must be instrument that is also configured with LEL/oxygen sensors) to determine if a flammable atmosphere is present, which will be necessary to monitor for if there is a potential for sparks such as during hot work tasks (if performed) in locations where accumulation of organic vapors may concentrate as follows.

- Monitor for combustible vapors (percent lower explosive limit [%LEL]) prior to any spark-producing tasks in a contaminated area. If at any time LEL concentrations equal or exceed 10 percent by volume in air, then work will cease, mechanical excavation equipment and other possible ignition sources in the immediate work area will be shut down, and workers will move a safe distance away from the work area. Work will not resume until vapor levels drop below 10 percent LEL and remain below this level.

All direct reading air sampling results from the previous day will be discussed with the site crews at the morning tailgate safety meeting. Personal exposure monitoring (not currently anticipated) results will be communicated to the individual sampled in a letter that will be delivered no later than 1 week after the testing results have been received. If personal air sampling using sampling pumps and collection media are used, the sampling protocol will be verified with the SHM, the method of sampling and analysis will use National Institute for Occupational Safety and Health (NIOSH) methods, and the samples will be sent to an American Industrial Hygiene Association (AIHA) accredited laboratory for analysis. Personal monitoring results will also be discussed with crews whose exposure is represented by the monitoring event.

Laboratory results and follow-up actions and recommendations will be reviewed and approved by the SHM. TtEC will submit air monitoring results, after the sample results are signed by the testing laboratory, to the employee performing the air monitoring, the employee who analyzed the sample, and the SHM. Employees will be notified of their exposure monitoring results in accordance with OSHA regulations and standards and will be informed of their rights to medical information in accordance with OSHA regulations.

9.7.2 Site Control Measures

This section outlines the means by which TtEC will delineate work zones and use these work zones in conjunction with basic decontamination procedures (Section 9.7.3) to prevent the potential spread of contaminants, including off-tracking of soil into previously unaffected areas of the site.

When there is a potential for coming into contact with or spreading of site contaminants during the RA (e.g., during excavation and stockpiling) or installation of piezometers, a three-zone approach will be used. The three-zone approach will be comprised of an exclusion zone (EZ), a contamination reduction zone (CRZ), and a support zone (SZ). The degree of control and the requirements for establishment and management of these zones will be at direction of the SSHO based on site conditions, the potential for spreading of or contact with contaminants, and activities being performed.

Site control requires the establishment of a regulated area and designated site work zones appropriate to the work task.

To minimize the transfer of contaminants from the site (in areas where this is a concern) and to control access into potentially hazardous areas where work is being performed, project personnel will:

- Schedule operations that use minimum numbers of personnel.
- Establish site work zones around each worksite location as appropriate and post signage.
- Implement appropriate decontamination procedures.
- Keep the client and other affected contractors informed of changing work zones.

9.7.2.1 Exclusion Zone

EZs will be formed where active work areas and tasks are being performed where entry by unauthorized or uninformed persons could be hazardous or require additional controls. Barricades or cones, along with caution tape, will delineate the EZ.

For EZs that are set up to control chemical exposures or contamination, workers will place contaminated tools and equipment on plastic sheeting (when required) in the EZ to prevent contamination of the surrounding area as required until the tools are appropriately decontaminated and removed from use.

9.7.2.2 Contamination Reduction Zone

Adjacent to the EZ, the CRZ will serve as a buffer zone to prevent the spread of contamination beyond the work area. Workers will either wrap contaminated tools and equipment with plastic, or workers will decontaminate the equipment and themselves in this area before moving to the next work area. The appropriate level of decontamination will depend upon the work task and whether the tools and/or personnel were in contact with the contaminated soil and whether any soil adheres to the worker's PPE or tools. The SSHO will assist in recommending the proper levels of decontamination for work tasks.

9.7.2.3 Support Zone

The SZ will be arranged considering accessibility, utility availability, wind direction, and line-of-sight to work. Typically, the SZ is located in an upwind direction from the work areas. This is

where equipment such as a fire extinguisher, first aid kit, spill kit, hand washing facility and any other appropriate support is located.

9.7.3 Personal Hygiene and Decontamination

This section provides decontamination procedures and guidelines for developing site- and activity-specific decontamination procedures.

9.7.3.1 Responsibilities

The SS is responsible for establishing and maintaining appropriate equipment and personnel decontamination areas and ensuring that subcontractors follow this plan. The SSHO will assist the SS to ensure that adequate decontamination procedures are identified for tasks and followed to prevent contamination of individuals or the environment beyond the EZ.

9.7.3.2 Contamination Avoidance

Avoiding contamination is the first and best method for preventing the transfer of contamination, including adhering soil and mud to personnel or to non-contaminated or clean areas. Each person involved in site operations must regularly practice the methods, listed below, for contamination reduction.

- Know the limitations of the protective equipment being used.
- Do not sit or lean against anything in a contaminated area and try to limit the need for excessive contact with contaminated media.
- Use the proper tools to safely conduct the job.
- Inspect tools and equipment for gross contamination with soil and/or mud before tracking out of work area or onto paved roads.

9.7.3.3 Decontamination

Decontamination for this project involves physically removing contaminants from equipment and/or PPE. Decontamination, proper PPE-donning and doffing procedures, and management of work zones minimize the chance of cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

In general, decontamination will consist of:

- Removing residual materials from tools and equipment or personnel regardless of their source before taking breaks or engaging in hand-to-mouth activities.
- Employing soap and water wash and rinse for hands and, if required, face. Hygiene wipes may also be used but is not a substitute to hand washing with soap and water.
- Keeping break areas clean. No potentially contaminated PPE or equipment will be permitted in these locations or offices.

- Proper doffing of used and contaminated PPE and proper storage of reusable PPE after decontamination and between uses.

9.7.3.4 Personnel Decontamination Guidance

It is anticipated that in most instances, PPE will not be contaminated and can be doffed and stowed for reuse without wet decontamination. However there may be a need to use a boot wash or other minor wet decontamination if workers walk in areas of soils or sediments and have mud adhering to PPE or boots.

Personnel decontamination, if wet methods are used will consist of a soap/water wash and rinse for outer protective equipment (boots, gloves, raingear, etc.) if they become contaminated with soil or mud and will be reused rather than discarded. This determination for level of decontamination required will be made by the SSHO. This function will take place in an area adjacent to the site activities in the CRZ within a secondary containment where water, if generated, can be collected and containerized for proper disposal in accordance with the Waste Management Plan. A hand washing station will be available for workers to wash their hands before leaving the work area or taking breaks. Workers will be instructed to wash hands before going on breaks.

9.7.3.5 Equipment Decontamination Guidance

It is anticipated that heavy equipment, such as excavator buckets and portable hand tools such as shovels will be cleaned of adhering soil or mud (if present) along with any loose debris prior to being moved out of the work area using brooms or wipes. Heavy equipment tires, tracks and buckets are not anticipated to come into contact with contaminated soil and wet decontamination methods are not anticipated to be required for equipment at this time. Tracked vehicles will not be operated onto roadways.

The SS will be responsible for evaluating equipment both arriving on site and leaving the site. The Equipment Inspection Checklist included in Appendix D will be used to document these inspections. Equipment will only be authorized access or exit with this authorization. Evaluation will consist of a visual inspection to ensure that visible contamination has been effectively removed.

9.7.4 Biological Hazards

Biological hazards may be encountered on site. Workers should anticipate the likelihood of encountering these hazards, especially in undeveloped outdoor areas. Insect bites and insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects can be more serious such as anaphylactic shock, which can lead to severe reactions in the circulatory, respiratory, and central nervous system and, in some cases, even death. The SSHO will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting.

Personnel will not attempt to capture or feed any wild or semi-wild animals such as cats, rats, or ground squirrels due to the possibility of a bite or parasitic infestation. Additionally:

- Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard, including lung diseases and allergies. Personnel will not touch such droppings.

9.7.4.1 Insects

Insects, including bees, wasps, hornets, spiders, ticks, may be present at this site making the chance of a bite or sting possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition; any individuals who have been bitten or stung by an insect will notify the SSHO. Field personnel who may have insect allergies are strongly encouraged to provide this information to the SSHO prior to commencing work, and will be instructed to have their prescribed allergy medication on site. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply N, N -Diethyl- meta –toluamide (DEET) (vapor-active repellent) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. Note: Allow the permethrin to dry before using the treated clothing.
- Wear proper protective clothing (work boots, socks and pants).
- Tuck pant leg into socks and wear long-sleeved shirts.
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Avoid placing bare hands under rocks or loose debris

Mild insect stings or bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the stinger. The suction device in commercially available snake bite kits can also be used to remove the stinger. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought immediately. Immediate medical care is essential for persons who are allergic to insect bites/stings. If an allergic person receives a spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given, if necessary, to supply oxygen to the victim. Various spiders may be encountered at the site and many spiders have the potential to bite; however, there are no dangerous spiders of particular concern in the area.

9.7.4.2 West Nile Virus

West Nile virus (WNV) encephalitis is a mosquito-borne viral disease that can cause an inflammation of the brain. WNV is transmitted to people by the bite of a mosquito that has become infectious after feeding on a bird infected with the virus. Birds serve as the reservoir hosts of WNV, and the principal vector in the transmission from one bird to another is the mosquito.

Most infections produce no symptoms in people, or symptoms are mild or moderate. Approximately 80 percent of those infected with WNV will show no symptoms. About 20 percent

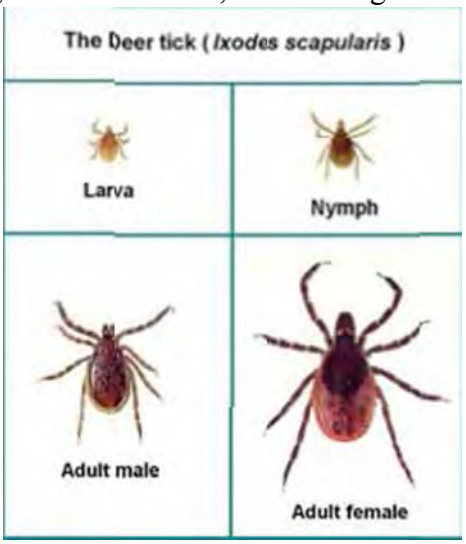
of cases produce mild symptoms including: fever, headache, and body aches, often with skin rash and swollen lymph glands. Less than 1 percent of cases show more severe infections marked by headache, high fever, neck stiffness, muscle weakness, stupor, disorientation, convulsions, paralysis, coma, and, rarely, death. Persons age 50 years or older and immune-compromised individuals are at a higher risk of developing a more severe infection. Symptoms of WNV will generally last a few days, although even some healthy people report having the illness last for several weeks. The symptoms of severe disease (encephalitis or meningitis) may last several weeks, a though neurological effects may be permanent.

Control measures to prevent contacting WNV include:

- Mosquitoes are most active at dawn and dusk. Limit outdoor activities at those times, when possible.
- Wear long-sleeved shirts and long pants.
- Spray DEET on your skin and permethrin on clothing and work boots.

9.7.4.3 Lyme Disease

Lyme disease is caused by an infection from the bite of a deer tick, which is about the size of the head of a pin. During the painless tick bite and following the blood meal, a microorganism (spirochete) may be transmitted into the bloodstream that may lead to Lyme disease. A 24- to 48-hour period is necessary for the tick to feed and become engorged. During this time period, it is unlikely that the tick has regurgitated its stomach contents into the host and therefore, infection is unlikely.



Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibodies has been successful in preventing more serious symptoms from developing. The effects of the disease vary from person to person, which often makes it difficult to diagnose. Typically, the incubation period ranges from two days to two weeks. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October, when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme

disease never get the rash. Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis. Lyme disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

Control measures to prevent contracting Lyme disease include:

- Avoid dense or high brush, when possible.
- Wear light colored clothing.
- Spray DEET on your skin and permethrin on clothing and work boots.
- Tuck pant legs into socks and shirts into gloves, if possible.
- Self/buddy check neck, hairline, groin, and body after working in areas that may contain deer ticks. Shower immediately after returning home from the job site.

If a tick is found biting an individual, the SSHO will be contacted immediately. The tick can be removed by grasping the tick with tweezers as close to the skin as possible, and pulling gently or using a tick removal system (e.g., Pro-Tick, www.scs-mall.com/store/). The affected area should then be disinfected with alcohol or similar antiseptic. If personnel feel sick or have signs similar to those above, they will notify the SSHO immediately. Additionally, employees finding engorged ticks on their body will be given a medical examination.

9.7.4.4 Poisonous Plants

Poison ivy, oak, or sumac may present in New Jersey and may be encountered in vegetated areas of the site if such plants have become established in these areas. The potential for contact with poisonous plants (i.e., poison ivy, poison oak, and poison sumac) exists when performing fieldwork in undeveloped and vegetated areas. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison ivy has white berries and red or yellow foliage in the fall of the year. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down." Poison sumac has white, hairy berry clusters.

Contact with poisonous plants may lead to a skin rash in susceptible individuals. A rash results from a toxin found in the sap; it is extruded from the leaves and contained in the stems and roots. The rash is characterized by reddened, itchy, blistering skin requiring first aid treatment. In the

event of contact with one of these plants, immediately wash skin thoroughly with Dawn soap and cool water, Technu or Zanfel, taking care not to touch face or other body parts.

Avoidance of plant/sap contact is the only effective means of preventing the poisoning. A person experiencing symptoms of poisoning should remove contaminated clothing; wash the exposed areas thoroughly with Dawn soap and cool water, taking care not to touch face or other body parts. Apply Technu or Zanfel to wash the affected area, use calamine or other poison ivy lotion if the rash is mild. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity. Employees will be trained in the identification of these species and will be advised to wear protective clothing such as gloves and long-sleeved shirts when working conditions permit. Employees should also consider applying barrier lotions (e.g. Ivy Block) to skin that has the potential to contact these species. Alcohol wipes, Dawn liquid soap and Technu can be used to decontaminate skin and reusable clothing to prevent exposure to poison ivy. Gloves should be worn when removing and decontaminating clothing potentially exposed to poison ivy.

9.7.4.5 Snakes

There are two species of snakes in New Jersey that are known to be venomous. These snakes include the Northern copperhead and the Timber rattlesnake. Numerous harmless snakes also may be present, and though not venomous, could also bite if cornered. If a snake is encountered, slowly and quietly back away from the snake and let it retreat. Avoid placing hands in dark spaces, including burrows, crevices, and under materials or debris. Do not attempt to move or kill a snake, as certain snakes are protected under state and federal laws. In the event of snakebite, wipe off the skin and notify the SSHO immediately. If the snake is suspected of being one of the venomous varieties or if you do not know whether it is or is not:

- Seek immediate medical attention and safely try to document as much information about the snake as possible (color, markings, size, etc.) and record the time the bite occurred.
- Keep the affected area below heart level to reduce the flow of venom.
- Remove rings or constricting items as the bite area can swell.
- Give the person first aid and treat for possible shock.
- Apply a bandage, wrapped two to four inches above the bite to help slow the venom but not tight enough to cut off the flow of blood.

Do NOT – apply cold compresses, apply a tourniquet, cut into the bite, attempt to suck out the venom, give the person any medications or anything by mouth but water, or raise the site of the bite above the level of the person's heart. Await or transport the person to emergency medical care.

If the snake is determined not to be venomous, apply first aid to avoid infections and contact WorkCare® for medical follow up and recommendation to prevent infection.

9.7.4.6 Bloodborne Pathogens

Bloodborne pathogens enter the human body and blood circulation system through punctures, cuts, or abrasions of the skin or mucous membranes. They are not transmitted through ingestion (swallowing), through the lungs (breathing), or by contact with whole, healthy skin. However, under the principle of universal precautions, all blood should be considered infectious, and all skin and mucous membranes should be considered to have possible points of entry for pathogens. Two primary bloodborne pathogens include Hepatitis B and human immunodeficiency virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS).

Potential bloodborne pathogen exposures include:

- Contact with contaminated medical equipment or medical waste or sharps
- Medical emergency response operations such as administering first aid or cardiopulmonary resuscitation (CPR)

To reduce the risk of contracting a bloodborne pathogen, take the following precautions:

- Avoid contact with blood and other bodily fluids.
- Use protective equipment when giving first aid/CPR, such as disposable gloves and breathing barriers.
- Thoroughly wash your hands with soap and water immediately after giving care.

When cleaning up blood or other bodily fluids:

- Clean up the spill immediately or soon as possible after the spill occurs.
- Use disposable gloves and other PPE when cleaning spills.
- Wipe up the spill with paper towels or other absorbent materials.
- After the area has been wiped up, flood the area with a solution of one quarter cup of liquid chlorine bleach to 1 gallon of fresh water and allow it to stand for at least 20 minutes.
- Dispose of the contaminated material used to clean up the spill in a labeled biohazard container.

The SSHO should be notified of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job. Site personnel will be given bloodborne pathogens training.

9.8 Hazard Communication Program

Specific hazardous materials or chemicals that will be brought onto the project site are anticipated to be minimal (e.g., fuel, oil, lubricants necessary to perform routine maintenance of or operation of equipment, spray paint for marking utilities or excavation limits, etc.). When any material or chemical is brought onto the site, a MSDS or SDS must be provided to the SSHO.

A preliminary Hazardous Materials Inventory is included in Appendix G along with associated MSDS or SDS as appropriate (as can be identified presently). This inventory, and associated MSDS or SDS will be updated whenever additional hazardous materials to be used onsite become known. This includes all hazardous materials brought onsite by the subcontractors for their operations.

The SSHO will file the MSDSs or SDSs in a notebook that will be available in the field office. The SSHO will review the MSDSs or SDSs with the workers, and this training will be documented on the daily safety meeting form. All workers will have general HAZCOM training that explains how the program is managed at the site and that specifically requires them to notify the SSHO when any new material is brought onto the site.

All containers will be labeled specifying the content and hazards of the material in the container.

9.9 Process Safety Management Plan

Not applicable.

9.10 Lead Abatement Plan

Not applicable.

9.11 Asbestos Abatement Plan

Not applicable.

9.12 Radiation Safety Program

Not applicable.

9.13 Abrasive Blasting

Not applicable.

9.14 Heat/Cold Stress Monitoring Plan

There is a potential for heat stress and cold stress or related injuries during the performance of the RA at NAWC Trenton from exposure to ambient temperatures and season in which the work is conducted, effects of wind chill, effects of radiant loading, level of work activity, and level of PPE worn during work tasks and other factors, which can add significant heat stress to otherwise routine tasks. TtEC Procedure EHS 4-6 – Temperature Extremes will be followed during work activities.

9.14.1 Heat Stress

Heat stress-related problems include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke.

- Heat rash occurs because sweat is not evaporating, causing irritation and vesicular inflammation. Standing erect and immobile in the heat allows blood to pool in the lower extremities. As a result, blood does not return to the heart to be pumped back to the brain and fainting may occur.
- Heat cramps are painful spasms of the muscles due to excessive water and salt loss from profuse sweating.
- Similarly, heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. Heat exhaustion is characterized by clammy and moist skin, nausea, dizziness, headaches, and low blood pressure.
- Heat stroke is characterized by dry skin due to lack of sweating, dry mouth, mental confusion and convulsions.

A person exhibiting signs of heat stress should be removed from the work area and moved to a shaded/cool area immediately. The injured person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately. **EARLY RECOGNITION AND PROMPT TREATMENT OF HEAT STRESS SYMPTOMS, INCLUDING HEAT STROKE, ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.** Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illnesses. To avoid heat stress, the following steps, as necessary, will be implemented:

- Adjust work schedules.
- Monitor temperature with a wet bulb globe thermometer (WBGT).
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.
- Perform physiological monitoring.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kilograms [kg]) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.
- When heavy sweating occurs, encourage the worker to drink more. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

The following strategies may be useful:

- Maintain water temperature at 50° to 60 degrees Fahrenheit (°F) (10°-16.6 degrees Celsius [°C]).

- Provide small disposable cups that hold about 4 ounces (0.1 liter).
- Have workers drink 16 ounces (0.5 liters) of fluid, preferably water or dilute drinks, before beginning work.
- Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break.
- A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.
- Train workers to recognize the symptoms of heat-related illnesses.
- Rotate personnel and alternate job functions.
- Cooling vests when impermeable clothing is worn.

Early symptoms of heat stress related problems may include:

- Decline in task performance
- Lack of coordination
- Decline in alertness
- Unsteady walk
- Excessive fatigue
- Muscle cramps
- Dizziness

In summary, proper training and preventive measures will aid in averting loss of worker productivity and serious illness from heat stress. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat-related illnesses. To avoid heat stress, maintain worker's body fluids and electrolytes at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids intake must approximately equal the amount of water lost in sweat, e.g., 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kilograms) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

9.14.2 Cold Stress

Cold weather in New Jersey could present the potential for cold stress during spring, fall, and especially winter months and temperatures may drop below freezing. As a result of the potential for freezing rain, snow, sleet and wet weather, with the added potential for wind chill, cold stress will be discussed as follows:

- Exposure to low temperatures presents a risk to employee safety and health through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity, and reduced dependability of equipment.
- Work conducted in the winter months can become a hazard for field personnel due to cold exposure. The personnel must exercise increased care when working in cold environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic

cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illnesses will be discussed during the health and safety briefing conducted prior to the onset of site activities.

- Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to 95°F. As hypothermia progresses, depression of the central nervous system becomes increasingly more severe (Table 9-2). This accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness.

Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20°F. Frostbite could be a concern in New Jersey during this field effort if the fieldwork is conducted in the winter months. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction. The three general categories of frostbite are:

- Frostnip – a whitened area of the skin which is slightly burning or painful.
- Superficial frostbite – waxy, white skin with a firm sensation but with some resiliency. Symptomatically feels “warm” to the victim with a notable cessation of pain.
- Deep frostbite – tissue damage deeper than the skin, at times, down to the bone. The skin is cold, numb, and hard.

In preventing cold stress, the SSHO must consider factors relating both to the worker and the environment. Training, medical screening, establishment of administrative controls, selecting proper work clothing, and wind-chill monitoring contribute to the prevention of hypothermia and frostbite. Recognizing the early signs and symptoms of cold stress can help prevent serious injury. Thus, workers will be trained to recognize the symptoms of hypothermia and frostbite and have appropriate first aid instruction. When the air temperature is below 50°F, the SSHO will inform workers of the proper clothing requirements and any work practices that are in effect to reduce cold exposure.

- Cold injuries and illnesses recognition and prevention measures will be emphasized during daily safety briefings when the potential for cold injuries and illnesses exists.
- Work will cease under unusually hazardous conditions.
- Phenothiazine (a sedative) and beta blocker drug use will be prohibited.
- A heated area will be available on site.
- Temperature will be recorded daily on site.
- Warm beverages will be available on site.

The SSHO will establish a work/rest schedule based upon worker monitoring. At the first sign of uncontrollable shivering, the worker will be rested in a heated shelter. Work will be stopped when the air temperature reaches 0°F.

Workers will be encouraged to layer clothing when air temperature is below 50°F. Clothing that has a high insulation value will be worn under protective garments. Insulated gloves will be worn when the wind chill index is below 32°F (i.e., air temp 50°F and wind speed > 20 miles per hour [mph] or air temp 40°F and wind speed > 5 mph). Insulating dry clothes will be available.

9.15 Crystalline Silica Monitoring Plan (Assessment)

Not applicable.

9.16 Night Operations Lighting Plan

Night operations are not anticipated to be required during the fieldwork. All work will be performed during daylight hours.

9.17 Fire Prevention Plan

Fire prevention and protection measures require preplanning. Fire extinguisher capacity and location are shown in Table 9-1.

Employees will follow safe work practices, including proper storage of flammable and combustible liquids, and the following rules:

- Smoking is permitted only in those areas designated specifically by the PM, SS, or SSHO in accordance with NTR/FEAD Construction Manager instruction.
- Personnel will follow TtEC hot-work procedure, EHS 6-5 and permit requirements (not currently anticipated) to ensure that work is performed in a safe environment.
- Refueling will be performed only in a designated area with a 60: BC fire extinguisher present.
- Equipment must be refueled with the equipment turned off (except under special circumstances as required by an operator's manual).
- No refueling will be performed unattended.
- Latching on fueling hoses is prohibited. Smoking is prohibited in any area where refueling is performed.
- Compressed gases, if present, will be secured only in an upright position. Flammable gases will be stored separately from oxygen gas cylinders. Any flammable cylinder storage areas (if any) will be posted as "FLAMMABLE, NO SMOKING."
- All other flammable liquids will be stored in an approved storage cabinet, unless they are for immediate use.
- Non-sparking and explosion-proof equipment and tools will be used whenever the potential for ignition of flammable or explosive gases, vapors, or liquids exists.

Hot work is not planned, but, if required (for instance if grinding or cutting or welding will create sparks), no hot work is permitted until it is determined that the area is gas-free and that there are no flammable or combustible materials stored within 50 feet of the work area. The TtEC Hot

Work Procedure, EHS 6-5 and its' permit system will be implemented if any work is considered to be hot work, including fire watch.

9.18 Wild Land Fire Management Plan

Not applicable.

9.19 Hazardous Energy Control Plan

TtEC Procedure EHS 6-4, Lockout/Tagout, establishes the Control of Hazardous Energy Program. This program applies to all TtEC operations, except as follows:

- Work on cord- and plug-connected electrical equipment where the plug is under the control of the employee performing the work
- Hot tap operations
- Work involving minor changes and adjustments to equipment during routine operations (such as small tooling adjustments)

Details on the methods used to control hazardous energy for a defined task must be documented in the AHA for that task. The SSHO will ensure appropriate Lockout/Tagout procedures are evaluated and included within the AHA if hazardous energy sources are present and maintenance or servicing is required. The specific control of hazardous energy procedures required will be based on the manufacturer's instructions. A copy of the equipment user's manual will be available onsite and referenced. The AHA will be reviewed and approved by the SHM and Contracting Officer, then the approved AHA will be reviewed with workers prior to performing the task so that workers understand the need for Lockout/Tagout as it relates to use of this equipment and how it is to be implemented. Energy may be present in the form of electrical, pneumatic, hydraulic, and kinetic forms and the specific Lockout/Tagout means and methods must be suitable to the hazard presented by the equipment and the activities that will be performed.

9.20 Critical Lift Plan

Either a truck mounted hydraulic crane or a hydraulic crawler crane (*capacity and exact model not yet determined)* equipped with a vibrating hammer attachment will be used onsite to drive and remove the sheet pile used to shore the excavation sidewall. It is not anticipated that this task will be considered a critical lift; however this section contains information about the requirements for crane use on this project, for hoisting and pile driving that will be required for this task. The crane lift(s) will be included in a Lift Plan for each activity. Should the crane subcontractor determine that the lift is a critical lift, the Lift Plan will be a Critical Lift Plan as outlined in Section 16.H of EM 385 1-1 and TtEC Construction Procedure CP-13, Critical Lifts.

In addition to the crane task identified above, hoisting operations (lifting of equipment [not personnel)] by means of mechanical equipment such as an excavator and/or front end loader) may occasionally be required for loading and unloading of trucks or placement of equipment and materials such as trench boxes in support of excavation shoring/shielding tasks. This section also

addresses hoisting and rigging activities by construction equipment that may be performed on this project.

9.20.1 General Requirements for Hoisting

Hoisting tasks will be suspended during excessive inclement weather at the discretion of the Competent Person (TBD). Equipment manufacturer's recommendations will be followed to determine ability to perform safe hoisting or pile driving operations based on wind calculations.

All rigging used in hoisting operations will be inspected by the competent person each day before use. Defective equipment or equipment showing excessive wear will be taken out of service. Rigging equipment will be used in accordance with the equipment manufacturer's instructions and will not be used for loads in excess of rated capacity. Rigging will be properly stored and maintained when not in use. Only positive latching devices will be used to secure the load and rigging. Design, testing, and capacities of fabricated lifting devices will be maintained on site.

All hoisting equipment documentation, including inspection, training, certification records, and load data will be maintained on site. If any unsafe conditions or faulty equipment are detected, the equipment will not be used until the problem is resolved and satisfactory inspections have been completed. Daily pre-use inspections will be performed each day hoisting or pile driving operations are to be performed. Inspections will include all functioning parts and systems, mechanical structures, and site conditions associated with hoisting or pile driving operations.

Hazards during hoisting operations include being struck by loads during movement, being crushed underneath loads during placement, and being cut or pinched while handling loads or its rigging. Other hazards could include equipment rollover or boom collapse due to side loading of the boom. Controls that will be used to mitigate hazards will include the following:

- Implementation of the above requirements for equipment and personnel performing hoisting operations.
- Crane load charts will be used to plan picks based on crane and boom configuration.
- Only authorized and qualified persons will be involved in hoisting and rigging operations. Personnel involved in hoisting will use standard signal systems for communication during operations. The crane or equipment operator and rigger will have the authority to stop or suspend work if there is a safety concern related to the hoisting operation. A signal person will be used during all hoisting operations and is the only person directly communicating with the crane or equipment operator.
- Personnel will not be allowed to enter the swing radius of the crane or heavy equipment while equipment is in motion. When rigging and unrigging a load, whenever possible, all heavy equipment and rigging devices will be grounded. If grounding is not possible, all loads including the rigging devices will be lowered to the extent possible, all motion will be stopped, and eye contact will be made between the rigger and operator before attempting to unsecure the rigging.
- A guide rope will be attached to the load to allow positioning without requiring personnel in the vicinity of the placement location.

- Appropriate hand protection such as leather work gloves will be worn while handling the load, the guide rope, and the rigging, to protect against rope burns, cuts, scrapes, and pinch points.
- Prior to performing hoisting operations, the work area will be inspected and evaluated for hazards and unstable surface conditions. Hoisting operations will only be performed if adequate space is available for maneuvering and on stable ground surfaces.

9.20.2 Hoisting by Mechanical Equipment

Hoisting operations performed using on-site hydraulic excavators or loaders will only be by equipment and operators meeting the requirements of this section will be used for hoisting operations. If manufacturer procedures for lifting and transport of hoisted loads are unavailable, the equipment will not be used for hoisting. Because hoisting and rigging using mechanical equipment is may be performed on this project, an AHA has been prepared and will be followed when hoisting and rigging is used. The requirements of EM 385 1-1 (USACE 2011), Section 16.S –Hydraulic Excavators, Wheel/Track/Backhoe Loaders Used to Transport or Hoist Loads with Rigging, have been incorporated into the AHA in accordance with Section 16.S.03.a. The AHA includes the following:

- Written proof of qualifications of equipment operators, riggers, and others involved in the operations
- Operational testing performed as per EM 385 1-1 Section 16.S.03.b
- Proper operating procedures in accordance with the equipment manufacturer's operating manual
- Proper use and on-site availability of manufacturer's load rating capacities or charts
- Proper use of rigging, including positive latching devices to secure the load and rigging
- Inspection of rigging
- Use of tag lines to control the load
- Adequate communications
- Establishment of a sufficient swing radius (equipment, rigging, and load)
- Stability of surfaces beneath the hydraulic excavating equipment

Heavy equipment used for hoisting will be certified for the application by the equipment manufacturer and will be selected based on capacity to meet the load requirements of the project. Before heavy equipment intended to be used for hoisting operations is used, it will be inspected, tested, and certified by a competent person to be in accordance with the manufacturer's recommendations for use. An operational test with the selected hydraulic excavating equipment will be performed in the presence of the government-designated authority (if present or if requested). Heavy equipment used for hoisting operations will be supplied and operated in accordance with equipment operations manuals, guides, procedures/instructions, and load charts. Operational testing will be performed using a load equivalent to the maximum anticipated load to be lifted by each piece of equipment during the course to the project. Details of the testing and results will be documented.

9.20.3 Crane Activities

A specialty subcontractor will be used to operate the crane and perform any crane related hoisting and pile driving tasks. Each crane operation will require development of a Lift Plan, which will be developed by the specialty subcontractor specifically for these tasks as a separate deliverable. If the lift is a critical lift (not anticipated to be the case), the plan will be developed in accordance with TtEC Corporate Procedure CP-13 – Critical Lifts and will be a Critical Lift Plan.

This Lift Plan will meet include all the required elements and provide details on the specific crane configuration and capacity as well as hoisting and rigging and other personnel who will be used to accomplish the tasks. The Lift Plan will be submitted through the NTR/FEAD Construction Manager to the Navy's Crane Safety Department as part of the Crane Package. Names of the competent persons (crane operator, rigger[s]), certifications and inspection packages for the crane and rigging/hoisting/pile driving equipment, and other required information will be included in the package. An on-site crane inspection will be performed by a Navy representative with the subcontractor prior to approval of the crane package and Lift Plan. Crane and hoisting operations and equipment, operators and rigging specialists, and inspections and certifications will meet the requirements in Section 16 of EM 385-1-1 as well as any OSHA laws and regulations, whichever are more stringent.

Operational testing will be performed on the crane used for hoisting operations prior to initial use and after servicing major equipment components. An operational test will be performed to demonstrate that the test load and rigging can be safely lifted, maneuvered, controlled, stopped, and landed. The operational test will performed in a manner that represents all the aspects of the operation including rigging equipment, configuration, positioning, and all necessary ranges of motion and travel. Operational testing will be performed using a load that is equivalent to the maximum anticipated load to be lifted by each piece of equipment during the course of the project. Details of the testing and results will be documented. An AHA has been included specifically for the pile driving and removal task in which cranes will be used.

9.20.4 Pile Driving Operations

Pile driving activities will be performed using a crane equipped with a vibrating hammer pile driving attachment. The pile driving operations will be performed in accordance with applicable parts of EM 385-1-1, Section 16.R – Pile Drivers and OSHA regulations, whichever is more stringent.

During pile driving operations, noise levels are high and hearing protection must be worn. Pile drivers will be equipped with a positive and negative restraint device to prevent accidental hammer disengagement. With the exception of the pile driving equipment operator, personnel will not stand under the kicker/spotter or directly under, in front of, or closer than 12-feet (or more as required by manufacturer), of the pile hammer or pile when the pile is being driven. The crane operator will be protected with falling object protective structures. During hoisting and removal of pile, all employees will be kept clear when piling is being hoisted into the leads. Hammers will be lowered to the bottom of the leads while the pile driver is being removed. During extraction, if

piling cannot be pulled without exceeding the load rating of equipment, a pile extractor will be used.

As part of, or in addition to the Lift Plan required for crane related activities, the specialty subcontractor will be required to develop a site-specific safety plan for the pile driving operations containing the required elements of EM 385-1-1, Section 16.R.02. An AHA for crane operations has been developed and includes pile driving task hazards and hazard mitigation strategies. This AHA will be reviewed by the specialty contractor, and if required, will be updated as more information about the tasks and hazards is known.

9.21 Contingency Plan for Severe Weather

The potential for severe weather is possible as the site is located near the Atlantic seaboard where storms can occasionally be severe, including potential hurricane force winds on occasion. In addition, thunderstorms are possible. The SSHO will monitor the weather forecast daily. In preparation for an approaching storm, all equipment will be secured, and all doors and windows of the equipment and offices will be closed. All tools and supplies will be stored in a designated secure location. Open excavations and current work tasks will be safely idled and secured as necessary.

If particularly ominous weather conditions are predicted, the SSHO will monitor radio broadcasts or National Weather Service reports regularly. Nearby thunderstorms could have lightning associated with them. Whenever a thunderstorm arises, the SSHO will determine if lightning is within 10 miles of the site. If lightning is close to the site, work will stop until no lightning activity is observed for a minimum of 30 minutes and workers will seek shelter in a full enclosed vehicle cab or other fully enclosed structure. A lightning meter will be available on-site as an indicator of approaching storms. A Hurricane Preparedness Plan has been prepared and is included as Section 9.2.1 below.

The SS and the SSHO will assess what work procedures can be safely performed when wind conditions exceed 25 mph and for on water work, diving work, or crane activities, lesser wind speeds may require consideration of work suspension. They will also give consideration to fugitive dust and odor emissions, the safety of equipment in high winds, and protection of workers from flying debris and dust in windy conditions.

9.21.1 Hurricane Preparedness Plan

Hurricane season starts June 1 and ends November 30. The following information is from www.nhc.noaa.gov/prepare/wwa.php:

- **Tropical Storm Watch:** An announcement that tropical-storm conditions are possible within the specified area.
- **Hurricane Watch:** An announcement that hurricane conditions are possible within the specified area.

Because outside preparedness activities become difficult once winds reach tropical storm force, watches are issued 48 hours in advance of the anticipated onset of tropical-storm-force winds.

Action: During a watch, prepare and review your plan for evacuation in case a Hurricane or Tropical Storm Warning is issued. Listen closely to instructions from local officials.

- **Tropical Storm Warning:** An announcement that tropical-storm conditions are expected within the specified area.
- **Hurricane Warning:** An announcement that hurricane conditions are expected within the specified area.

Because outside preparedness activities become difficult once winds reach tropical storm force, warnings are issued 36 hours in advance of the anticipated onset of tropical-storm-force winds.

Action: During a warning, complete storm preparations and immediately leave the threatened area if directed by local officials.

- **Extreme Wind Warning:** Extreme sustained winds of a major hurricane (115 mph or greater), usually associated with the eyewall, are expected to begin within an hour.

Action: Take immediate shelter in the interior portion of a well-built structure.

When a warning of gale force winds is issued, the SS will have supervisors and workers take precautions to minimize danger to persons, and protect the work and nearby TtEC and Government property. These precautions include, but are not limited to: closing openings; removing loose materials, tools and equipment from exposed locations; and securing temporary work. Close openings in the work areas (e.g., windows, doors, bins, equipment cabs, etc.) when storms of lesser intensity pose a threat to the work or any nearby TtEC or Government property.

It is advised that before an emergency, each contractor secure emergency disaster kit with nonperishable food, potable water (at least one gallon per person for each day) and other supplies (e.g., flashlights, first aid kit, emergency NOAA weather radio, blankets, toiletries, etc.) in sufficient quantity for their personnel to last for at least 72 hours. In addition, persons should, if time allows, have their prescription medicines with them when they seek shelter and let the PM know the location where sheltering will occur.

There are four hurricane conditions of hurricane readiness. Unless directed otherwise, the SS and SSHO will comply with the following directives and direct contractor and subcontractor personnel as follows:

a. **Condition FOUR** (Sustained winds of 50 knots or greater expected within72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation

of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards.

b. **Condition THREE** (Sustained winds of 50 knots or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact COR for weather and Condition of Readiness updates and completion of required actions.

c. **Condition TWO** (Sustained winds of 50 knots or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact COR for weather and Condition of Readiness updates and completion of required actions.

d. **Condition ONE.** (Sustained winds of 50 knots or greater expected within 12 hours): Secure the jobsite, and leave Government premises.

Personnel will leave the site upon a notice to leave Government premises and each supervisor will ensure their personnel and families (as applicable) are instructed to gather together offsite in a safe place of refuge such as a storm shelter. The TtEC SS will notify the PM as to the status of the crew and evacuation notice. Stay away from windows and doors during a hurricane and stay indoors. Await official word from emergency personnel if a hurricane does occur before leaving safety of shelter or driving on any roads. Prior to returning to work after a hurricane, the TtEC SS and SSHO will (with Government permission) conduct an evaluation of any worksite damages and precautions that may be required prior to allowing workers to return to work and will report damages to the PM, SHM, and COR.

9.22 Float Plan

Not applicable.

9.23 Site-Specific Fall Protection and Prevention Plan

Workers will not to climb onto the top of a work trailer, shipping container, or any other platform or slope edge that does not have proper guard rails and exposes them to a potential fall of 6 feet or more without adequate fall protection. In addition, workers will not work within 6 feet of an excavation that is 6 feet deep or deeper unless proper guards or fall protection are in place. At the present time, there is no identified need for such an activity to occur to conduct work operations.

If workers could be exposed to fall hazards of 6 feet or greater, either a standard guardrail systems as per Section 21 of EM 385 1-1 will be put into place where workers could be exposed to a fall or workers will wear appropriate fall protection. If fall protection will be required for any work task (currently not anticipated to be required), the fall protection competent person (TBD) will develop and submit and implement onsite, a Site-Specific Fall Protection and Prevention Plan in accordance with Section 21.C of EM 385 1-1 which will be added to this APP by FCR. This plan shall include, in detail, the specific practices, equipment and methods used to protect workers from falling to lower levels. The plan will be updated as conditions change and at least every 6 months. Fall protection requirements will also be incorporated into the task AHA.

9.24 Demolition Plan (Engineering and Asbestos Surveys)

Not applicable.

9.25 Excavation/Trenching Plan

Soil excavations to remove the piping and TCE-contaminated soils will be to depths of up to ten feet in soil that is considered to be previously disturbed (class C). A formal excavation/trenching plan is required. The excavation tasks are also addressed in an AHA. This excavation and trenching plan requires site-specific updates for each excavation area to include design of the excavation and any specific shoring requirements that will be required.

Excavations will be performed by a medium to large sized excavator. The excavation will require protective systems to be designed and installed to stabilize the soil from cave-in and to protect and stabilize adjacent structures that could be undermined. Protective systems are required on all excavations over 5 feet in depth or in excavations less than 5 feet when examination of the ground by a Competent Person (TBD) reveals conditions that may result in cave-ins. Protective systems used on this project will include a trench box as well as installation of properly designed and installed temporary sheet piling, designed by a Qualified Person.

At the present time, there is no identified need for personnel to enter the excavation to perform any currently identified work tasks at depths greater than 4 feet (with Competent Person approval only) and this plan does not include excavation entry requirements and safety precautions other than herein. If the need for entry into the excavation is identified and an excavation is greater than 4 feet in depth, this plan will be updated to contain the requirements for conducting entry in a safe manner, including confined space entry considerations and permits that must be addressed.

All excavation work will be conducted in accordance with OSHA excavation regulations as described in 29 CFR 1926.651, Section 25 of EM 385-1-1, and TtEC Excavation and Trenching Procedure, EHS 6-3. At the present time, this plan identifies the basic requirements for trenching and excavation. Prior to beginning operations, this plan will be updated or supplemented with additional information to include additional required elements required in Section 25.A of EM 385 1-1 including:

- Identification and credentials of the Competent Person (currently TBD);

- Diagram or sketch of the area where the work is to be done, with adjacent and nearby structures shown;
- Method of testing to determine soil type (must be of an approved method; pocket penetrometer, plasticity/wet thread test or visual test and be conducted at least daily or as conditions warrant);
- Planned method of shoring, sloping, and/or benching;
- Location of utility shut offs (if required);
- Proposed methods for preventing damage to overhead utility lines, trees designated to remain, and other man-made facilities or natural features designated to remain within or adjacent to the construction rights-of-way;
- Plan for management of excavated soil/asphalt/concrete;
- Plan for traffic control; and
- Digging permits (excavation permits) as required.

An AHA has also been developed for excavation and trenching and will be updated as required based on more detailed site-specific analysis.

9.25.1 Pre-planning and Excavation and Design

Excavation areas will be identified on site drawings. A utility search will be conducted in accordance with TtEC Corporate Procedure EHS 3-15, including National One Call (811) and private utility locates to verify and mark presence of overhead and/or underground utilities.

The need for use of protective systems (e.g., trench boxes, shields, sheet pile, etc.) will be determined by the Competent Person. Manufacturer's tabulated data for the protective system, and if required, professional engineer design as per EM 385-1-1 Section 25.D will be available onsite. The following will be considered:

- Depth of excavations.
- Whether safe sloping is feasible alternative.
- Adjacent structures that may require stabilization or which may present surcharge loads on excavation faces.
- Stabilization of structures and support of utility lines traversing the excavation (if present): If supports for structures and utilities will be needed, these will be specified by a Qualified Person (e.g., registered engineer).
- Selection of cave-in protection systems: Trench shields or other cave-in protection systems, if used, will not be for entry by personnel, but will be for sidewall stabilization. The systems be will be selected by a Qualified Person (engineer) based on soil loading factors, including surcharges presented by structures, spoil piles, and equipment. Other factors including groundwater influences and/or vibration imposed by traffic and equipment will also be considered, as well as the shield manufacturer's limitations. If hydraulic shores are used, the design will be in accordance with the typical applications described in 29 CFR 1926 Subpart P, Appendix D, and the manufacturer's recommendations at a minimum. Adjustments will be made as necessary by the Qualified Person in consideration of the

factors listed above.

- Management of water and existing piping removed from the trenches: Air lances, shovels, or other non-intrusive methods may be used to dig an excavation to ensure underlying utilities are not damaged. Utility lines that traverse an excavation may be shielded and/or supported as necessary.

9.25.2 Identification, Duties, and Training of the Competent Person

Competent Persons will have an adequate combination of experience and training to classify soil types and select protective systems as outlined in 29 CFR 1926.652. Training and experience pertaining to qualification as a Competent Person will be documented and include the following:

- General safety practices related to working in or near open excavations
- Inspection requirements and techniques
- Classification of soils in accordance with 29 CFR 1926.652
- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652

9.25.3 Duties of the Competent Person:

- The Competent Person will provide site personnel with training on site-specific excavation requirements as outlined in this plan, the AHA, and the excavation design documents.
- The Competent Person will be on site daily. The Competent Person will complete the checklists and reports as required in EHS Procedure 6-3. A table of forms to be filled out and completed for excavation and trenching is included as Table 9-4.
- The Competent Person will ensure that in addition to the initial utility locate on the site maps, a physical locate survey is performed and the site is marked out in accordance with Procedure EHS 3-15.
- The Competent Person will ensure the manufacturer's data for the trench shield are available on site and copies are forwarded to the SHM and Qualified Person (engineer). The Competent Person will inspect the shields upon receipt to ensure they are the same model and size specified by the Qualified Person, all cross brace pieces are included, and that the shield is in good condition.
- The Competent Person, together with the Project Quality Control Manager, will inspect structure and utility supports as installed to ensure they meet the specifications established by the Qualified Person.
- Inspections will be repeated after each rain event, and often enough to detect conditions that may increase the hazards.

9.25.4 Project Implementation

General Procedures – Non Entry (*if worker entry into excavations greater than 4 feet is required, additional requirements must be included and this plan will be updated accordingly*):

- Fall protection systems will be required for excavations 6 feet or greater in depth if workers

will come within 6 feet of the leading edge.

- The excavation will be barricaded or backfilled when unattended for worker protection as well as public protection as required in EM 385-1-1, Section 25.
- The SSHO will evaluate excavations for hazardous atmospheres and conduct monitoring in accordance with this APP. Worker protection levels will be as outlined in this APP based on non-entry into any excavation that is greater than 4 feet deep (e.g., no confined space entry is currently anticipated or allowed).
- Where possible, utilities (if present) will be shut down, de-energized, and locked out before excavating though it is not anticipated that any utilities exist in the areas where excavations will be done. In these situations, TtEC will place locks on the controls and the Competent Person will complete the lockout/tagout permit in Procedure EHS 6-4, Attachment A.
- Non-aggressive excavation techniques (e.g., air lance/vacuum, hand digging) will be used within the buffer zone of active utilities according to Procedure EHS 3-15.
- Spoil piles will be placed a minimum of 2 feet (3 feet whenever possible) away from the excavation sidewalls.

The SSHO will notify the local fire department prior to beginning excavation work and portable fire extinguishers will be staged at each excavation jobsite. The work area will be isolated with barricades and/or warning tape as appropriate, and "Danger—No Smoking" signs will be posted.

9.25.5 Other Precautions

Should groundwater infiltrate the excavation, a pump will be used to remove groundwater entering and accumulating in the bottom of the excavations to the extent necessary to allow the work to be safely completed. Groundwater will be pumped into a holding tank or other approved impoundment where it is allowed to settle. The groundwater will then be treated via the existing groundwater treatment facility located onsite (system operated by another onsite contractor).

If an excavation is 6 feet or greater in depth, field personnel must be at least 6 feet from the edge of the excavation unless fall protection systems are in use (guardrails or personal fall arrest system). If a personal fall arrest system is used, there must be an anchorage point capable of withstanding 5,000 pounds, a lanyard or self-retracting lifeline that does not allow a person to fall more than 3 feet, and a full body harness. If a fall arrest system is used, the competent person for fall protection will be designated by the PM.

Excavations may not be immediately backfilled because soil sampling may be required to verify contaminated soil removal; however, open excavations present a safety hazard to workers and the public and may fill with water if groundwater is elevated or significant rainfall is experienced, so in general, backfilling should occur as soon as possible after sampling and completion of further excavation. The excavation will be barricaded or backfilled when unattended as required in EM 385-1-1 Section 25.B to prevent personnel, vehicles, and equipment from falling into excavations and to protect members of the public.

9.26 Emergency Rescue (Tunneling)

Not applicable.

9.27 Underground Construction Fire Prevention and Protection Plan

Not applicable.

9.28 Compressed Air Plan

Not applicable.

9.29 Formwork and Shoring Erection and Removal Plans

Not applicable.

9.30 Precast Concrete Plan

Not applicable.

9.31 Lift Slab Plans

Not applicable.

9.32 Steel Erection Plan

Not applicable.

9.33 Site Safety and Health Plan for HTRW Work

Elements of Section 28 of EM 385-1-1 have been included within this APP.

9.34 Blasting Safety Plan

Not applicable.

9.35 Diving Plan

Not applicable.

9.36 Confined Spaces

A confined space is any enclosed area having a limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere or oxygen deficiency that may exist. Examples of confined spaces include, but are not limited to tanks, boilers, vessels, bins, manholes, tunnels, pipelines, underground utility vaults, and any open-top spaces more than 4 feet in depth such as trenches, pits, and excavations.

The SSHO will not allow entry into any confined space unless specifically authorized in this plan by qualified personnel following all required safety precautions for confined space entry according to EHS Procedure 6-1 and OSHA's Permit-Required Confined Space Regulations (29 CFR

1910.146, and Section 34 of EM 385-1-1. The SSHO will evaluate the site for any potential confined spaces and ensure they are appropriately marked with warning signs and that personnel are informed that entry into these spaces is prohibited unless the requirements of this plan are fully developed and implemented for confined space entry and are approved by the SHM.

At the present time, there is no authorized entry into any excavation that is deeper than 4 feet and workers will be instructed that there is no entry authorized and will be trained to recognize the hazards that are possible within confined spaces such as excavations during site orientation.

Site workers are provided confined space awareness training as part of the project orientation training. As part of this awareness training, workers are instructed on how to identify confined spaces, what entry requirements there are, and who to contact if they believe a confined space exists. The awareness class is not the required training class if entry into a confined space is required. Workers who enter, attend, or supervise entry into a confined space, including rescue must have additional training in compliance with 29 CFR 1910.146 and be designated as qualified to perform their assigned tasks related to confined space entry by their employer.

9.37 Physical Hazards and Controls

Physical hazards not otherwise addressed in the above sections are covered in the following sections.

9.37.1 Noise

Site activities will involve the use of equipment exceeding occupational noise exposure limit action levels. Exposure to noise equal to or exceeding the OSHA 8-hour time-weighted average (TWA) sound level [85 decibels adjusted (dBA)] could result in hearing loss. To minimize this hazard, the SSHO will ensure the following measures are employed:

- Noise monitoring and worker education on hearing conservation principles
- Effective use of hearing protection by all personnel working near excessive occupational noise sources
- The use of engineering and/or administrative controls to reduce employee exposures to noise, where possible

Sound level monitoring may be conducted on site using a noise survey meter. Personnel with a standard threshold shift will be restricted from high noise exposure, or will be required to wear hearing protection. Workers on site will be instructed to observe the “noise rule of thumb” on this project, described as follows:

In general, if a worker must raise his/her voice to be heard by someone standing next to him/her (within 2 feet), noise levels may be exceeding 85 dBA and hearing protection will be required.

9.37.2 Motor Vehicles and Heavy Equipment

The project will use an excavator and/or a front-end loader to perform materials and soils handling tasks. In addition, dump trucks and other large and smaller trucks may be used for deliveries or to haul waste and materials on and off site. This equipment poses unique and immediate hazards that, if uncontrolled, can result in severe injury or fatality. Other traffic may be present at the site from other tenants and contractors and this traffic can also present a hazard to workers. Injuries can result from malfunctioning equipment, improper operation, or personnel placing themselves in operator "blind spots" or between pieces of the equipment, or between equipment and immovable objects.

Personnel will receive initial and regular reminders that it is their responsibility to remain out of the operating areas of any moving heavy equipment to avoid being injured. In addition, the following precautions will be taken to help prevent injuries and accidents:

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horns, and other safety devices will be checked at the beginning of each work day.
- Examination of hydraulic lines will emphasize those lines in close proximity to the operator.
- A piece of paper or cardboard will be employed to check for high pressure leaks in this area that could result in hydraulic fluids being injected into the skin. Using gloved or bare hands for this inspection is prohibited.
- Large equipment will not be backed up unless equipped with a reverse signal alarm, audible above the surrounding noise level, and backup warning lights, or unless the vehicle is backed up only when an observer (spotter) signals that it is safe to do so.
- Motor vehicle cabs will be kept free of all non-essential items and all loose items including equipment and/or samples will be secured.
- The parking brake, for vehicles so equipped, will be set before shutting off and dismounting a vehicle.
- Wearing of seat belts is mandatory at all times when vehicle is in operation.
- During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory.
- All posted traffic signs and directions from flagmen will be observed.
- Personnel will be prohibited from placing themselves between operating equipment and immovable objects.
- Personnel will wear class 2 high-visibility vests to increase visual recognition whenever working within 15 feet of an established traffic pattern/route or working near heavy equipment.
- Efforts will be directed to minimize the number of personnel within an area where equipment is being operated.

Heavy equipment operators have a limited field of vision and may not be aware that someone is near the equipment being operated. Therefore, although heavy equipment is required to be equipped with warning devices such as backup alarms, and the operator is required to operate with

caution, it is incumbent on personnel in the area to maintain sufficient distances from the equipment. For example, a sufficient distance is beyond the reach of an excavator turning a full 360 degrees with its bucket and boom fully extended. It is also incumbent on personnel in the area to ensure that they have made eye contact with the operator prior to moving within the reach of the excavator or other mechanical equipment. The operator must cease operations and rest the bucket (or other extension) on the ground before personnel approach. Caution will be exercised at all times. It will be emphasized that personnel should NEVER place themselves between operating heavy equipment and immovable objects due to the potential for crushing injuries and death. Furthermore, it is required that the operator obtain a spotter for all backing operations.

Heavy equipment, if brought on site (e.g., excavator or backhoe, etc.) will be controlled via the following measures:

- Ensuring that only appropriately qualified/experienced personnel are permitted to operate the devices.
- Initial and periodic inspections of heavy equipment to provide safe operation will be documented by using the Equipment Inspection Checklist found in Appendix C.
- Keeping heavy equipment operations areas clear and otherwise adequate to allow for the safe movement of the equipment without endangering personnel or property.
- Implementing appropriate vehicle maintenance and decontamination operations.

Safe and proper practices will be followed at all times, or vehicle operating privileges will be suspended or revoked at the discretion of the SSHO. The SSHO will be responsible for ensuring that these requirements are implemented on site.

TtEC personnel will follow local traffic rules. Other contractor and/or tenant operations may be ongoing simultaneously with TtEC activities in some areas. Coordination with other contractors and the tenants will be done as required through coordination with the NTR/FEAD Construction Manager to ensure traffic safety and the delineation of controlled work zones. Site vehicles will yield to pedestrians, if present. Personnel working in areas subject to vehicular traffic (streets, parking lots, and so forth) will wear class 2 high-visibility safety vests. Flashing light or reflectorized barricades will be used for roads that are blocked due to equipment or excavation. Fences may be used to delineate controlled work zones when necessary to keep unauthorized personnel out of the work area and to secure the area during non-work hours. Personnel will not direct traffic unless they have received training in compliance with OSHA regulations and EM 385-1-1 Section 04.B.12.

9.37.3 Electrical Hazards

In order to prevent accidents caused by electric shock, the SSHO will inspect any electrical connections on a daily basis. The SSHO will shut down and lock out any equipment that is found to have frayed or loose connections until a qualified electrician is contacted and repairs are made. The equipment will be de-energized and tested before any electrical work is done. The equipment will be properly grounded prior to, and during, work. In addition, ground fault circuit interrupters

(GFCIs) will be installed for each circuit between the power source and tool for outdoor use. In the event that generators are used to supply power, these generators will contain GFCIs.

Requirements for electrical safety include:

- Electrical wiring and equipment will be listed by a Nationally Recognized Testing Laboratory (NTRL). The usual recognized testing laboratories are Underwriters Laboratory (UL), Canadian Standards Association (CSA-US), and Factory Mutual (FM).
- Live parts of wiring and equipment will be guarded to protect persons or objects from harm. Un-insulated live wires must be placed at various heights and distances from the ground and from buildings, depending on the voltage carried by those lines. (Consult the SHM if un-insulated live wires are anticipated.)
- Transformer banks and high-voltage equipment will be protected from unauthorized access.
- A qualified electrician will perform the work on electrical power supplies and lines. No live electrical work will be performed unless a permit is obtained from the NTR/FEAD Construction Manager as specified in EM 385-1-1 Section 11.A.02(c) and the SHM has approved the procedure. Compliance with Section 11 is required. Live electrical work requires arc flash protection.
- Flexible cords (extension cords) will contain the number of conductors required for service, plus a ground wire. Cords will be rated for hard usage (S, SE, SEO, SO, SOO, ST, STO, STOO). Flexible cords are not allowed to pass through doors or windows, or to be placed on the ground where they are subject to being run over by vehicles. If flexible cords must pass through walls, the cords will be protected by bushings or fittings.
- Flexible cords must be inspected on each day of use. No splices or fraying are allowed.
- Flexible cords will not be secured with staples, hung from nails, or suspended by bare wire. (Plastic tie straps, commonly used today, are acceptable.). Extension cords will not be plugged into other extension cords. Extension cords will not be plugged into power strips.
- Portable lamps must have bulbs protected by a substantial guard and attached to the lamp holder handle.
- The circuit breaker panels and electrical transformers and supply equipment must be labeled as to the voltage contained therein.
- The circuit breaker panels must be labeled as to what each breaker controls.
- The breaker panels and electrical panels must have a cover protecting any live exposed wires.
- At least a 36-inch clearance must be maintained on three sides of the circuit breaker boxes, transformers, and electrical supply equipment so as to provide ready access to the equipment in the event of an emergency.
- Circuit breaker boxes that are locked, or kept in locked rooms, must have a key readily available in the event of an emergency.

9.37.3.1 Portable Generators

Portable generators, if used, must meet the requirements for grounding as specified in the National Electrical Code (NEC) National Fire Protection Association 70. NEC 250-6 has certain exemptions for the grounding of portable and vehicle-mounted generators. Refer to EM 385-1-1, Section 11, for additional details. Portable generators will be operated in open air only, where there is sufficient ventilation to prevent accumulation of exhaust gases, including carbon monoxide.

9.37.3.2 Overhead Electrical Hazards

Overhead power lines may present a hazard to equipment and personnel. To prevent equipment contact with power lines and to prevent arcing, adequate clearance must be maintained. TtEC requires a minimum clearance of 15 feet. If adequate clearance cannot be maintained, electrical disconnects may be required to secure against a contact hazard. Based on site information, there are two power poles with lines that may require disconnect through the utility provider prior to starting some activities. The voltage of overhead lines must be ascertained in order to determine if more than 15 feet clearance is required.

9.37.3.3 Underground Utilities

A high-loss-potential hazard includes ground disturbing activities with its associated potential for contact with underground utilities. When conducting intrusive activities such as grading, the opportunity to encounter fire, explosion, or electrocution hazards exists from inadvertent contact with underground utilities. Therefore, the locations of underground utilities will be verified prior to performing any intrusive activities and precautions will include: white-lining the area of excavation; having utilities located using a private locating service, National One Call (811); and performing a geophysical survey to clear utilities in the area of the intrusive operations.

9.37.4 Slips, Trips, and Falls

Planned activities associated with construction operations will bring field personnel into areas with potential slip, trip, and fall hazards. These hazards may include the following:

- Uneven terrain due to cultural debris or depressions.
- Slopes and excavations
- Workplace clutter
- Wet or slippery surfaces.

Hazards of this nature and the potential consequences of injury from a slip, trip, or fall are more likely when personnel are maneuvering and carrying equipment on these work sites or are busy with tasks and not paying attention to surroundings.

Control measures may include the following:

- Selecting the best approach routes to work areas and locations, keeping in mind that these

may not be the shortest routes
- Applying traction grit such as sand over slippery surfaces
- Maintaining good housekeeping practices
- Using barricades or other appropriate warnings to demarcate hazard areas
- Proper selection and use of portable ladders (as required)
- Proper selection and use of fall protection equipment (as required)

The SSHO will evaluate all walking/working surfaces to ensure these comply with the objectives stipulated in 29 CFR 1926 Subparts C – General Safety and Health; G – Signs, Signals and Barricades; Subpart L – Scaffolds; Subpart M – Fall Protection; Subpart P – Excavations, and Subpart X –Stairways and Ladders. Requisite strength, heights and widths, and fall protection will be evaluated as required for the work tasks. Also refer to EM 385-1-1.

9.37.5 Head Injuries

At a minimum, workers will don hard hats if they have an overhead hazard or when working around heavy equipment. This will prevent minor injuries caused by bumping one's head while working around the site.

9.37.6 Falling Objects

Raised items will be slowly lowered to the ground using a grapple and/or skip bucket. No personnel will work under equipment or suspended loads at any time. Also, the supervisor will verify that a sufficiently wide area is clear of personnel while the equipment is in operation. An AHA has been prepared for hoisting operations using mechanical equipment (such as an excavator) if required.

9.37.7 Heavy or Awkward Lifting

Hazards associated with heavy or awkward lifting are more frequent in the early morning hours (prior to muscles becoming limber) and later in the day (as a result of fatigue). The following provisions will be used to minimize hazards of this nature:

- Use machinery, lifting-assist devices (two wheeled carts or dollies), or multiple personnel for heavy lifts, where possible. (TtEC prohibits lifting more than 50 pounds without assistance.)
- Use proper lifting techniques.
- Plan your lifts: place heavy items on shelves between the waist and chest and lighter items on higher shelves. Also, if the load must be carried to another location, plan and inspect the route to ensure that slipping/tripping hazards are absent.
- Stretch and limber muscles prior to and after extended periods/frequent lifts.
- "Test" the lift; before attempting to fully lift or move an object, give the object a "nudge" to assess its approximate weight and your ability to safely lift and move it without injury. If you are not confident that you can complete the lift without hurting yourself, either get a lifting aid (such as a dolly or mechanical hoist), get help from others, or both.
- Move as close to the load as possible, and ensure that good hand holds are obtainable. Wear

gloves where necessary to improve hand holds.

- Lift with your legs, not your back; bend your knees slightly and avoid turning and twisting at the waist when lifting, carrying, or depositing loads.
- Break lifts into steps if the vertical distance from the starting point to the placement of the lift is excessive.
- Periods of high-frequency lifts or extended-duration lifts should include sufficient breaks to guard against fatigue and injury.

Other considerations associated with lifting injuries and muscle strains include the following:

- Assess the area available to maneuver the lift.

Rearrange the area, remove clutter, and minimize the necessity of twisting and turning.

- Evaluate the area of the lift.
  - Investigate conditions of the walking/working surfaces where the lift will occur, over the planned path of travel, and at the location the load will be deposited.
  - Conditions such as poor housekeeping/clutter, slippery surfaces, and rough or uneven terrain may magnify the potential for injury during a lift.
- Take into account your overall physical condition
  - Report previous injuries on your Medical Data Sheet or inform supervisor of limitations.
  - DO NOT attempt to lift items that will put you at risk.
  - Break loads that you must carry into smaller, manageable loads, and get assistance whenever significant lifting tasks are involved.

By evaluating applicable contributing factors, planning your lifts, and incorporating feasible control measures, the potential for injury associated with lifting can be minimized.

9.37.8 Portable Power Hand Tools

Any portable power tools (e.g., saws, drills, pressure washers, etc.) used in the work area must have appropriate guarding, interlocks, or controls to ensure safe operation. Machinery and equipment must be inspected for defects in the guarding, electrical safety, and operation before each use.

The following specific precautions regarding power hand tools will be used to help prevent injuries and accidents:

- Never remove, make inoperative, or reduce the effectiveness of any equipment or machine guard.
- Never override any safety interlock or attempt to operate any piece of equipment or machinery without guards or other required safety devices in place and fully functional.
- Never operate any piece of equipment or machinery when it is functioning improperly or

at any time when operation would constitute a hazard. Malfunctioning equipment must be repaired immediately or removed from the premises.

- Do not use electrically-powered tools near flammable materials or within an explosive atmosphere, unless they are of the explosion-proof type meeting the National Electric Code (NEC) requirements for explosive areas. Employees operating the equipment should be aware of sparks and/or metal fragments when using this equipment.
- At no time will electrical power equipment be operated without proper grounding. All electrical cords and cables, including extension cords, must include a third wire ground.
- All electrical power tools will be listed by a NTRL and marked to indicate that they have double insulation if they are not internally grounded.
- Do not use electrical tools in wet or damp areas.
- Use tools only for their intended purpose (e.g., do not use a wrench to hammer an object). Defective tools (e.g., with mushroomed heads or split or defective handles) are to be taken out of service until they can be repaired, or they are to be replaced.
- Do not use conductive (i.e., metal) tools around energized electrical sources. Test insulated
- Select the correct size and type of wrench for each job. Wrench handles will not be extended with a pipe or "cheater" bar.
- Repair mushroomed punch, drift, and chisel heads or take the tool out of service and replace. Metal particles may break off and fly into the face or eyes of nearby workers when mushroomed heads are struck.
- Wear eye protection at all times when using hand tools (powered or manual).
- All hand tools and power tools will be inspected prior to use. TtEC employs inspection checklists and colored stickers and/or tape, as previously described, to indicate that equipment has been inspected and is ready for use.

9.37.9 Direct Push Drilling Hazards

The hazards of drilling present many of the physical site hazards addressed above such as noise, being struck by or caught between, overhead hazards, potential for contact with underground or overhead utilities, and working around heavy equipment. In addition, exposure to contaminants, if present in soil or groundwater within the borehole, including volatile organic vapors (if present) could be a possibility and precautions to mitigate exposures to potential contaminants of concern during drilling are addressed in Section 9.7.

Employees, including subcontractor personnel who operate, maintain and work on drill rigs shall have the applicable certifications, qualifications, and training in the operation, maintenance, and safe work practices for drill rigs. The drilling crew will review and follow requirements in equipment operator's manual, drilling safety plan, and this APP. The equipment's operating manual will be onsite.

The drilling safety plan prepared by the drilling subcontractor will be specific to the type of drilling equipment and operations to be performed, include all local, state, federal, and client requirements and regulations, and address applicable Environmental Health and Safety topics covered in the TtEC EHS Programs contained in this APP. TtEC Corporate Procedure, EHS 6-2 shall be followed

during drilling work activities (Appendix C) and the drill rig subcontractor will comply with EM 385 1-1 Section 18H.

Initial acceptance inspection for drill rigs and equipment shall be performed by the SS with the drilling subcontractor foreman when equipment first arrives on site and prior to using. Daily drill rig and equipment inspections shall be performed in accordance with manufacturer's recommendations and documented by the drilling subcontractor foreman on the daily equipment inspection form. The drill rig must be equipped with two easily accessible emergency shutdown devices, one for the operator, and one for the helper.

A survey of potential overhead hazards in the travel route and the zone where the boom will be raised will be conducted prior to bringing the drill rig onsite as well as underground utility locates for the well placement location. Any overhead hazards or underground utilities will be marked on the site layout plan and the required minimum clearance distances will be maintained at all times.

The drill rig equipment will be set up on stable ground and maintained level with all necessary cribbing used. Outriggers will be extended per the manufacturer's specifications.

The SDS for any drilling fluids will be submitted to TtEC and this SDS will be referred to in the Drilling AHA.

10.0 RISK MANAGEMENT PROCESSES

AHAs for the planned activities are included in Appendix A of this APP and listed in Table 10-1. If any new tasks are identified, or if planned activities vary from the written AHAs, the SSHO (with the assistance of the workers or subcontractors, etc.) will develop or alter the existing AHAs to address the specific activities. The AHAs listed will be reviewed by the SHM and will be submitted to the COR for review and approval.

11.0 REFERENCES

TtEC. 2014. Project Orientation, Rules and Safety Guidelines Handbook. February.

USACE. 2008. Safety and Health Requirements. Engineer Manual (EM) 385-1-1, Sep 2008 Consolidated. August 2011.

U.S. Department of Labor, Occupational Health and Safety Administration; 1910 – Occupational Safety and Health Standards, General Industry. Code 29 of Federal Regulations (CFR). Parts 1910.95, 1910.120, 1910.132, 1910.134, and 1910.147.

U.S. Department of Labor, Occupational Health and Safety Administration; 1926 – Occupational Safety and Health Standards, Construction Industry. Code 29 of Federal Regulations (CFR). Parts 1926.59, 1926.601, and 1926.602.

TABLES

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Table 3-1. Comparison of TtEC and 2013 BLS Data for NAICS Code 562910 (TRIR and DART Rates)

	NAICS 562910 Remediation Services 2013	TtEC 2012	TtEC 2013	TtEC 2014
Total Recordable Incident Rate (TRIR)	2.7	0..30	0.59	0.91
Days Away/Restricted Duty/Transfer Rate (DART)	1.6	0.15	0.59	0.30

Additional information:

0.7 DA Bureau of Labor Statistics (BLS) 2013

0.9 RT BLS 2013

Table 9-1. Type and Location of Emergency Equipment

Equipment	Location
Industrial First Aid Kit with Bloodborne Pathogens Kit	SZ for active work locations
Fire Extinguisher, one 10-A-60:BC	SZ for active work locations
Fire Extinguisher, one 1A-10:BC	Site vehicles and heavy equipment
Fire Extinguisher, one 60:BC	Refueling areas
Portable eye wash (15-minute/0/4 gallon per minute)	SZ for active work locations
Air Horn (if not equipped with vehicle horn)	SZ for active work locations
Spill Kit (appropriately stocked with sorbent pads, gloves, and bags)	SZ for active work locations and refueling areas.
Cellular Telephones or radios (as outfitted)	Minimum of SS, SSHO, each field supervisor, (others as required for safety and communication purposes)

Table 9-2. Emergency Contact List

Ambulance/Fire/Police (cellular or land line)	**911**
Medical **Hospital: Capital Health Medical Center Hopewell** **1 Capital Way, Pennington, NJ** **(See Figure 9-2)**	**911** (800) 637-2374 (Emergency Services)
WorkCare® Case Intervention	1-800-455-6155 1-888-449-7787
Poison Control	1-800-222-1222
Navy RPM/Work Plan Phase NTR, Jeffrey Dale	(215) 897-4914
Navy Construction Phase NTR/FEAD, NA	NA
Navy COR, Zane Perry	(757) 322-4777
Navy BRAC PMO East, Mr. Willington Lin	(215) 897-4904
TtEC PM, Derek Pinkham	(215) 702-4070 (office) (215) 200-5182 (cellular)
TtEC SHM, Roger Margotto, CIH	(619) 471-3503 (office) (619) 988-0520 (cellular)
TtEC SS, Jeff Bray	(619) 850-8846 (cellular)
TtEC SSHO, TBD	(xxx) xxx-xxxx
Other subcontractor key personnel contact information will be added at a later date when this information is known.	
NJDEP Hotline (any spill)	1-877-WARNDEP 1-877-927-6337
NRC (spills to water)	1-800-424-8802

Abbreviations and Acronyms:

BEC – BRAC Environmental Coordinator
BRAC – Base Realignment and Closure
CIH – Certified Industrial Hygienist
COR – Contracting Officer's Representative
FEAD - Facility Engineering and Acquisition Division
NJDEP – New Jersey Department of Environmental Protection
NRC – National Response Center
NTR – Navy Technical Representative
PM – Project Manager
PMO – Program Management Office
RPM – Remedial Project Manager
SS – Site Superintendent
SSHO – Site Safety and Health Officer
SHM – Safety and Health Manager
TtEC – Tetra Tech EC, Inc.

Table 9-3. Progressive Clinical Symptoms of Hypothermia

Core Temperature	Clinical
95°	Maximum shivering.
87°-	Consciousness clouded; blood pressure becomes difficult to obtain;
84°-	Progressive loss of consciousness; muscular rigidity; respiratory rate
79°	Victim rarely conscious.
70°-	Maximum risk of ventricular fibrillation.

Table 9-4. Excavation Inspection Forms

Title	Form[1/]	When	Comments
Underground Utilities Locating and Marking Checklist	EHS 3-15, Attachment A	Prior to digging	One report for each distinct location, as identified.
Underground Utilities Management Checklist	EHS 3-15, Attachment B	Prior to digging	At the beginning of the task, with additions/amendments made if unknown utilities or other changes are encountered during project implementation.
Soils Analysis Checklist	EHS 6-3, Attachment B	Beginning of the task, and whenever soil conditions change that may require downgrading the soils classification	--
Daily Excavation Inspection Checklist	EHS 6-3, Attachment A	Daily	Include with Daily Report. Only one checklist needed each day, but inspections should occur several times per day to ensure hazardous conditions do not develop.

[1/] Copies of the referenced forms are provided in Appendix D of this APP.

Table 10-1. Activity Hazard Analysis (AHA) List

AHA	TASK
1	Mobilization and site setup
2	Direct push soil boring and sampling
3	Installation and/or removal of temporary fencing
4	Hoisting and rigging by mechanical means
5	Excavation and trenching (including soil direct load out and backfilling)
6	Pile driving and extraction using crane
7	Grade and install new ditch drainage system components
8	Piezometer installation
9	Site restoration and seeding
10	Demobilization and waste disposal

FIGURES

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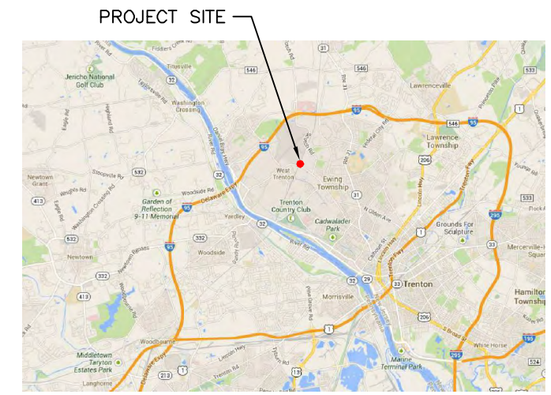
SITE LOCATION
NTS

INSET
NTS



VICINITY MAP

LEGEND

FIGURE 2-1

LOCATION MAP AND SITE VICINITY MAP

FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: –
AUTHOR: A.CRABTREE
PROJECT NO:
FILE: SEE BELOW

TETRA TECH EC, INC.

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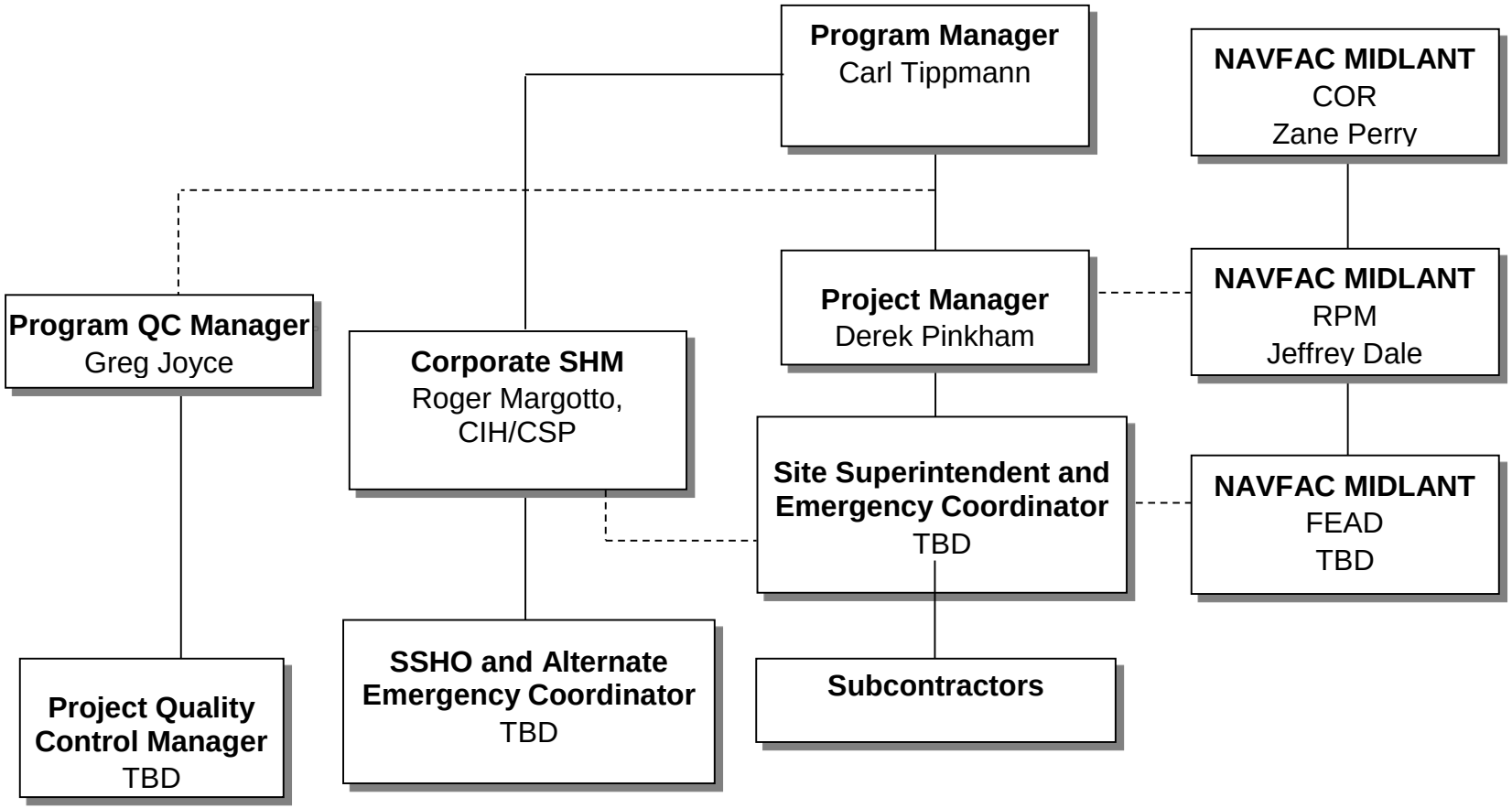
Figure 4-1. Organizational Chart



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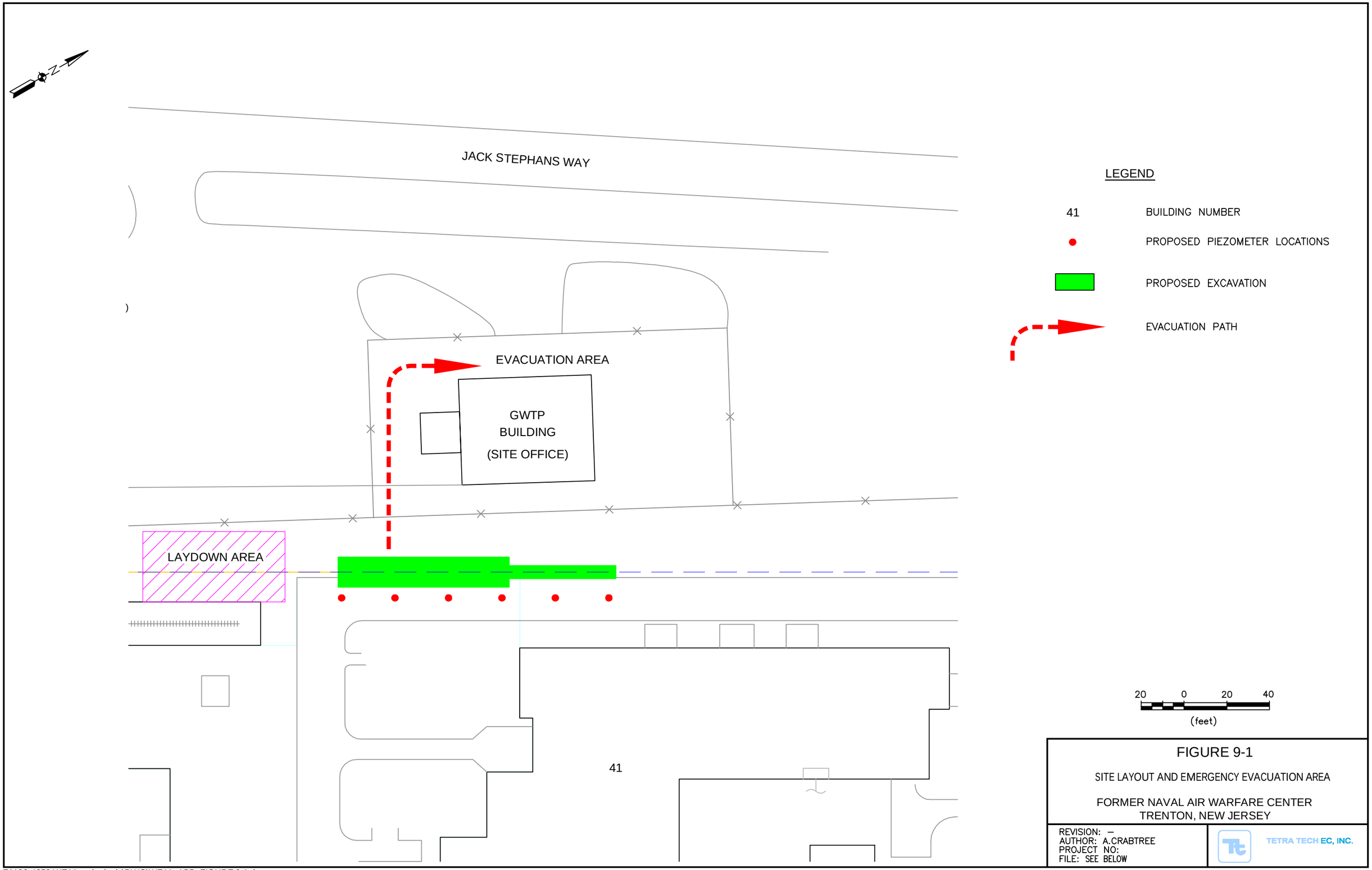


FIGURE 9-1

SITE LAYOUT AND EMERGENCY EVACUATION AREA

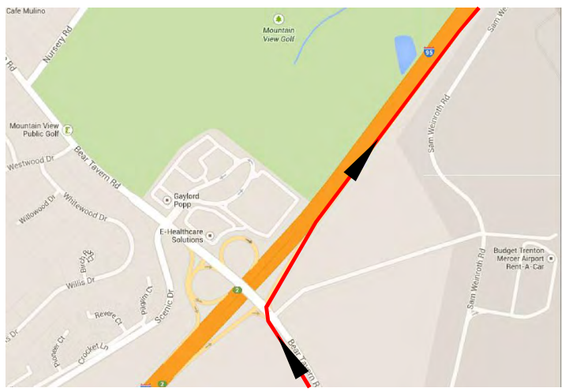
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: –
AUTHOR: A.CRABTREE
PROJECT NO:
FILE: SEE BELOW

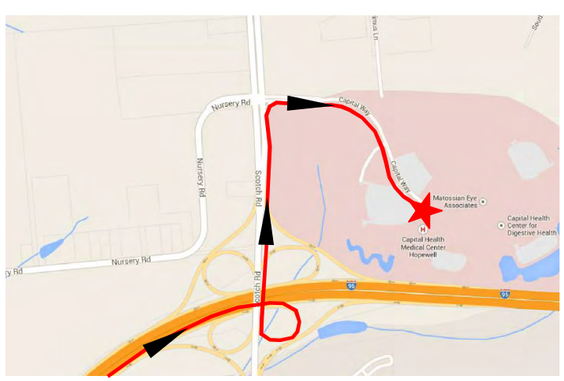
TETRA TECH EC, INC.

F:\106-4659.WE11- submittals\DWG\WE11_APP_FIGURE 9-1.dwg

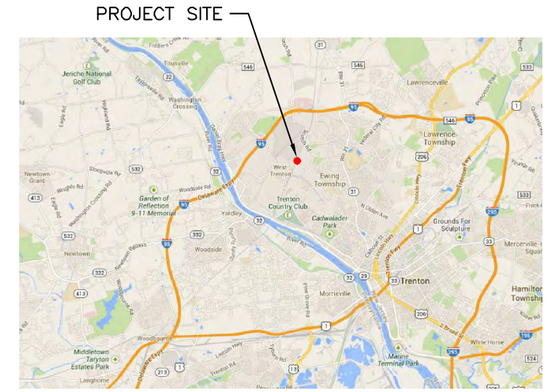
START AT PROJECT SITE
050 JACK STEPHANS EAY, TRENTION NJ, 08628



TAKE RAMP RIGHT FOR I-95 NORTH



ARRIVE AT CAPITAL HEALTH MEDICAL CENTER HOPEWELL
1 CAPITAL WAY, PENNINGTON, NJ 08534



VICINITY MAP

DIRECTIONS:

1. 1050 JACK STEPHANS EAY, TRENTION NJ, 08628
2. TURN RIGNT ONTO W UPPER FERRY RD / CR-634
3. TURN RIGHT ONTO BEAR TAVERN RD / CR-579
4. TAKE RAMP RIGHT FOR I-95 NORTH
5. AT EXIT 3A-B, TAKE RAMP RIGHT FOR SCOTCH RD / CR-6
6. BEAR RIGHT, AND THEN BEAR RIGHT ONTO CAPITAL WAY
7. TURN RIGHT TO STAY ON CAPITAL WAY
8. ARRIVE AT CAPITAL WAY, PENNINGTON, NJ 08534

FIGURE 9-2

ROUTE AND DIRECTIONS TO EMERGENCY HOSPITAL

NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

REVISION: –
AUTHOR: A.CRABTREE
PROJECT NO:
FILE: SEE BELOW

TETRA TECH EC, INC.

P:\CAD Project Files\Trenton CAD Files\DWG Files\FIGURE 9-2.dwg

APPENDIX A

ACTIVITY HAZARD ANALYSES

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Activity Hazard Analysis (AHA) #1

Activity/Work Task: **Mobilization and Site Setup**	**Overall Risk Assessment Code (RAC) (Use highest code)**					**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**					
Contract Number: N62470-13-D-8007	**Severity**	**Probability**				
Date Prepared: January, 2015		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by: Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	**H**	**M**	**M**	**L**	**L**
	Negligible	**M**	**L**	**L**	**L**	**L**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, Class 2 high visibility safety vest.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA #1 – Activity/Work Task: **Mobilization and Site Setup**

Job Steps	Hazards	Controls	RAC
1. Arrival at Location	Lack of Emergency Preparedness and Health and Safety before beginning work	Get to know the location if not familiar. SSHO to locate the emergency hospital and ensure routes are correct as shown in Figure 9-2 in APP. Conduct site orientation with the crew involved in mobilization tasking including establishment of laydown areas, unpacking and unloading and staging of materials and equipment and haul routes, review the APP and this AHA, and the Emergency Response Plan and document the training. Ensure communications are established and working properly among team members. Develop a plan for mobilization organization and tasking and emphasize communication. Ensure emergency and basic safety equipment and PPE is located and available for use prior to starting site work. Use buddy system. SSHO will ask site workers fill out	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	**Hazards**	**Controls**	**RAC**
		medical data sheets that are included in an appendix to the APP.	
2. Unloading and initial staging of materials and equipment including set up of site office (existing building will be used as TtEC office)	Vehicle operations from TtEC or other tenant operations and delivery vendors could cause injury to personnel or others onsite	Workers operating company vehicles will have a valid state issued driver's license. Any Commercial Driver's License (CDL) truck and trailers will be operated by CDL qualified drivers. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times when vehicle is in operation. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear class 2 high visibility vest when working around operating vehicle traffic. Site Superintendent will coordinate with NTR, FEAD Representative, and BRAC PMO Environmental Coordinator as required to identify travel and traffic patterns and to delineate work areas.	M
	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times when equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Delineate work areas where potential for contact with the public could occur. Wear class high visibility vest when working around construction equipment.	M
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 4 – Hoisting and Rigging, which will be followed in addition to this AHA if hoisting and rigging by means of mobile equipment such as excavator or loader is performed to unload and/or stage equipment and materials.	M
	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist and turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some workers) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Slips, trips, and falls could lead to injuries	Keep work areas free of debris and equipment in work paths. Follow good housekeeping in work areas. Correct hazards when seen, such as holes or other trip hazards. If they cannot be removed, they must be covered or marked. Ensure if buildings have stairs, that they have adequate rails. 29 CFR 1926.1052 (a) requires a 20-inch clearance on the platform from the door swing radius. Stairs and rails will be in good condition.	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	**Hazards**	**Controls**	**RAC**
	Handling sharp objects or using hand tools or knives could cause cuts, punctures, or scrapes	Wear leather work gloves when handling materials that may be sharp or have sharp edges. Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons (SSHO, TBD and SS, TBD) with first aid and CPR training onsite. Never carry a knife in one's pocket. Ensure knives have retractable blades. Cut away from the body.	M
	Exposure to poison ivy or oak.	Identify any "suspicious" vegetation that may be poison ivy or oak in the work area. Mark these areas with warning tape or spray paint and inform workers to the hazard. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear an "ivy blocker" and have Technu® or Zanfel post-exposure washing agent available. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details and train personnel in the identification and avoidance of these plants.	M
	Use of construction equipment could strike overhead power lines	The travel path, staging, and other locations where mobile equipment with booms will be operated will be evaluated for overhead lines. The SSHO or SS will establish the required clearance distances that are required and areas to be avoided will be marked and communicated or isolated through coordination with the local utility provider. The voltage of overhead lines must be known in order to ascertain if more than 15 feet minimum clearance is required.	M
	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP and implement EHS 4-6, Temperature Extremes during the project. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure adequate potable drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner.	L
	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working onsite. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Use the eyewash for the full 15-minutes, regardless if you feel that the object has been removed. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust.	M
	Wind could make materials hard to handle	Avoid handling materials that could respond like a sail (e.g., plywood) in wind. Position vehicles so that doors do not get caught by the wind when opened. Hang onto door when opening and closing in high wind. Open and close doors	L

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	**Hazards**	**Controls**	**RAC**
		carefully in the wind and only open one door at a time. SSHO to monitor wind conditions and make recommendations for halting certain activities if wind creates a hazard. Evaluate shutting down tasks if winds exceed 25 mph and are presenting a hazard.	
	Noise could cause hearing loss and make it hard to communicate	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working near or on heavy equipment and any other sources of loud noise.	M
	Lack of proper illumination in work areas could cause hazards to not be recognized or eye strain	During mobilization, if lighting is not yet set up, temporary lighting such as portable bright lumen flashlights may be necessary if ambient lighting is not sufficient, especially within the office space. Work during daylight hours or provide adequate lighting source for work areas to minimize potential for injuries to occur from lack of visibility.	L
	Any ground penetrating activities (e.g., trailer anchors, if used) – potential underground utilities could be contacted	Implement TtEC Corporate Procedure EHS 3-15 – Underground Utilities and local requirements to ensure all water, power, sewer, storm drain, communications, and gas lines have been located and marked. Call 811 (call before you dig) and obtain as-builts from Navy or tenants.	M
	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment, shipping container, building, trailer, etc. where there is exposure to a fall of 6 feet or greater (no proper guarding and rails in place) without a means of fall protection designed by a Competent Person. At the present time, there is no fall protection plan in place to cover this task and there is no identified need for such activity. A Site-Specific Fall Protection Plan would need to be developed and implemented by a competent person prior to doing the activity. SSHO to identify site fall hazards and ensure appropriate controls are in place if workers could be exposed to a fall.	M
	Potential trips or falls	Survey the site for any slip, trip, or fall hazards. Either eliminate the hazard or mark the hazard so it can be avoided. Use caution when walking around the site and wear sturdy leather work boots. Maintain a clean and orderly work site and keep travel pathways free of obstacles.	M
	Head injuries from struck by or falling objects	Wear hard hat when overhead hazards exist and when working in areas with operating construction equipment.	M
	Contact with biting or stinging insects	Workers will apply DEET to work clothing following manufacturer's instructions as a preventative measure for biting insects as required. Workers with allergies will let the SSHO know using the medical data sheet and will carry their own prescription medication as applicable. First aid and medical attention as required.	L
	Electrical hazards could be present during tool use or during	Ensure that a certified electrician performs all electrical work to hook up office building to electrical power source if not currently energized.	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	**Hazards**	**Controls**	**RAC**
	setup of office space	Electrician to properly ground systems in accordance with electrical code. Ensure that power cords are inspected and in good condition for use, that GFCIs are used properly, and portable generators are not overloaded. Ensure any power tools used are in good working condition and have third prong on cord or are double insulated. All live work requires arc flash protection. Contact SHM if there will be any live work so that additional precautions can be identified and incorporated into this AHA.	

AHA #1 – Activity/Work Task: Mobilization and Site Setup		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

APP – Accident Prevention Plan
BRAC – Base Realignment and Closure
EHS – Environmental, Health, and Safety
MSDS – Material Safety Data Sheet
OSHA – Occupational Safety and Health Administration
NTR – Navy Technical Representative
NRTL – Nationally Recognized Testing Laboratory
PMO – Program Management Office
SDS – Safety Data Sheet
SSHO – Site Safety and Health Officer
SS – Site Superintendent

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) #2

Job/Task: Direct Push Soil Boring and Sampling	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**	
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by: Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site or electronically for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, Class 2 high visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

AHA #2– Job/Task: Direct Push Soil Boring and Sampling

Job Steps	Hazards	Controls	RAC
1. Inspect work areas prior to bringing direct push rig onsite.	Workers could be injured by slips, trips, or falls in the area	Work areas will be visually inspected and pre existing slip, trip, and fall hazards will be marked, barricaded, or eliminated as is feasible. Work areas will be kept neat and in an orderly state of housekeeping.	M
	Rig could contact overhead power lines or other structures if present.	Ensure travel route for rig and rig placement location is free from overhead hazards. If overhead hazards do exist, ensure they are marked on drawings and communicated to the driller. Ensure direct push rig does not travel with mast raised. SSHO to work with driller to ensure mast and other equipment maintains adequate clearances at all times if overhead utilities are present and know what the voltage of lines is. The work site and the analysis of the route of travel will be covered at the pre-activity safety briefing along with this activity hazard analysis.	M

AHA #2– Job/Task: Direct Push Soil Boring and Sampling			
Job Steps	**Hazards**	**Controls**	**RAC**
	Direct push rig must set up on solid ground and be leveled	Ensure there are no buried structures below the rig and that the rig is able to level and stabilize, including outriggers, to perform the direct push operations at each location	M
	Potential for underground utilities in area of direct push operations	The proposed direct push area will be evaluated through proper utility locates, marking, and geophysical checks to ensure lack of hazardous utilities. Call National One Call: 811. Review facility as-builts and survey site for indications of previous installed utilities.	M
	Improper inspection of rig could cause workers to be exposed to hazards associated with operating and mechanical devices.	The rig and all associated equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. Equipment will be inspected before use and the beginning of each shift. Faulty or unsafe equipment will be tagged and removed from service. No faulty equipment or damaged items will be allowed in the work area. Verify the emergency shutdown system that consists of trip wires located at the right and left rear of the rig (located on each side – one for the driller and one for the driller's helper). Ensure that each wire shuts down the system when the trip wire is pulled or pushed. Inspect the brakes and tire pressure on the direct push rig. Inspect all cables on the rig. Inspect all hydraulic and pneumatic hoses. Ensure outriggers function within full range.	M
2. Direct push operations – set up work area and move rig into position	Failure to set up the work area properly could cause exposure to potential hazards such as electrocution, damaging of underground utilities, or tip-over of rig in unstable soil conditions.	The direct push rig will not be moved into any work area until the work area has been reviewed and the route of travel to any work site has been assessed for hazards (overhead lines, stability of roads and ground). Ensure that outriggers have stable ground in placement. Use cribbing mats as necessary.	M
	Damage to existing utilities in vicinity or contact with utilities. Ensure utility locates are performed.	Personnel will contact a service facilities engineer before working near utilities. (One call- 811 also contacted) Site access is to be provided by client. Ensure that the weight of rig on ground is evenly distributed and is not so heavy as to risk damaging underground lines that may be near the surface.	M

AHA #2– Job/Task: Direct Push Soil Boring and Sampling			
Job Steps	**Hazards**	**Controls**	**RAC**
		Ensure proper distance from overhead lines, minimum of 15 feet, more for higher voltages. Voltage of lines must be known.	
	Vehicle may move if not properly set up	Use spotter to properly position vehicle. Set brakes and place wheel chocks under front wheels of mobile rig. Extend stabilizer jacks and ensure that footing is sound. Inspect ground to ensure that it can support the weight of the outriggers. Use cribbing in areas where condition of soil is soft or uneven. Ensure vehicle is level to the vertical and horizontal planes.	M
	When raising mast, rig may not install properly due to the condition of rig and connecting cables.	Inspect all components of rig and mast to determine condition is sound. Make all repairs before raising rig.	M
	When raising rig, mast could come in contact with, or close proximity to, overhead power lines, causing electrocution of workers.	Mast and other equipment must be at least 15 feet from any overhead utility lines. Verify the voltage of any overhead power lines. If any lines are above 50 kilovolt (kV), the clearance distance must be greater as required in EM 385 1-1. Do not travel with mast raised.	M
	Worker may become pinned between rig and other truck components or under truck rig if servicing rig from under the truck is required.	When any part of the rig or equipment is in motion, workers will stand a sufficient distance from the moving parts so that the worker is not pinned between the moving parts. Workers will not manually “guide” any moving part of the rig when it is raised up. Workers will not work under the rig or the truck. If work must be done under the truck or rig, the drill crew supervisor will contact the SSHO to ascertain a safe method for lockout of the equipment to ensure that adequate blocking is installed.	M
	High winds could destabilize rig. Mast could act as a conductor during a thunderstorm.	Check weather conditions and forecasts to determine if conditions are acceptable for use of rig. Do not operate the rig if winds exceed manufacturer’s recommended tolerances. Never raise a mast in an area where lightning is within 10 miles of rig.	M

AHA #2– Job/Task: Direct Push Soil Boring and Sampling			
Job Steps	**Hazards**	**Controls**	**RAC**
	Noise.	Hearing protection will be worn whenever rig is in operation.	M
	Pinch points.	Avoid placing hands in places close to moving machinery. Wear leather work gloves as appropriate. Ensure proper guarding is in place as per manufacturer's instruction.	M
	Traffic in area of drilling.	Wear reflective class 2 high visibility safety vests. Barricade and mark drilling sites for visibility and separation from other traffic .	M
	Hazardous materials drillers use onsite could present hazard to workers using them	All hazardous material that the driller will bring onsite to use for the project (including bentonite) will have an MSDS/SDS and inventory will be submitted to the SSHO prior to bringing the material onsite. Crew using any hazardous materials will have had HAZCOM training. Only bring the minimal amount of hazardous material required to do the job onto the site. Provide sufficient engineering controls and PPE to users of the hazardous material as per the MSDS/SDS.	L
3. Direct Push Operations – start up drill and perform drilling	Pressurized hydraulic lines could rupture, causing release of hot hydraulic fluid. Hot fluid can ignite from contact with engine. Hot fluid can burn workers. Fluid can cause environmental contamination.	Personnel will have been trained in the use of direct push equipment. Inspect all hydraulic lines before placing rig in service. Any damaged hoses or connections must be replaced before unit is used. Immediately shut down the equipment. Do not place body in front of any stream of pressurized fluid. Ensure that first aid kit is readily available to treat injured workers. A spill control kit consisting of shovel, absorbent material, and disposal drum must be available at the drilling location. As quickly as possible, berm the liquid to minimize the area over which the liquid spreads. Manage soil cuttings and fluids in accordance with the Waste Management Plan. Refer to EHS Procedure 6-2 "Drill Rigs" for added safety information.	M
	Contact with or other exposures to potentially contaminated soils and groundwater which may contain TCE for	SSHO to monitor periodically at borehole and worker's breathing zone for signs of volatile organic vapors using MultiRAE™ PID sensor to ensure worker safety and protection from potential contaminants. If	M

AHA #2– Job/Task: Direct Push Soil Boring and Sampling			
Job Steps	**Hazards**	**Controls**	**RAC**
	drillers or sampling staff.	contamination is detected, SSHO will recommend additional levels of protection as required. The APP lists action levels. Do not generate dust. Use dust control techniques such as water mist as required. Direct push crew and samplers will wear goggle and face shield if splash hazards exist and raingear as required to keep potential site contaminants off work clothing. Nitrile gloves will be worn when handling contaminated material or media and when sampling. Hand washing facility will be nearby for workers to use before going on break. A contamination reduction zone will be established adjacent to the exclusion zone for decontamination.	
	Air hoses or hydraulic hoses under pressure could suddenly release and whip and hit workers, causing severe injury.	Do not disconnect air hoses and compressors until hose line has been bled. Visually inspect all connection of any lines under pressure. Use safety clamps (whip checks) to connect each side of connection to the other in the event the connection breaks. (The safety clamps will keep the hoses from whipping under the sudden release of pressure.) Tie back or attach hoses wherever possible to minimize the length of hose that could whip around in the event that there is a sudden release of pressure.	M
	Failure of sample device or direct push rod while under pressure	Ensure appropriate guards are in place and persons are positioned outside of the shields in case of sudden failure while in operation.	M
	Sampling staff and driller staff activities could overlap providing opportunity for physical hazards	Ensure that driller and sampling staff have means of communication and that before entering area to collect samples, samplers have positive approval from driller operator and that equipment is adequately shut down or idled to allow entry into work zone.	M
	Strains from manually moving materials, equipment, and drums of IDW.	Personnel will be directed to use proper lifting techniques such as keeping back straight, lifting with legs, limiting twisting, and getting help in moving bulky or heavy materials and equipment. Mechanical equipment will be used as much as possible (e.g., drum dolly). Use care when handling augers or drill rods. Avoid standing under any load. Get help for lifting any item that weighs 50 pounds or more.	M

AHA #2– Job/Task: Direct Push Soil Boring and Sampling			
Job Steps	**Hazards**	**Controls**	**RAC**
	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust.	M
	The mast could be used to lift other objects as it is being raised, causing potential failure of the mast.	Masts shall only be used in a manner specified by the manufacturer and should never be loaded beyond their capacity.	M
	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure adequate drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner. EHS 4-6, Temperature Extremes, will be implemented by the SSHO.	L
	Workers could climb mast and expose themselves to a fall hazard.	Climbing on the mast is not allowed.	M
	Workers could place hands into moving parts of the rig, or loose clothing could become entangled in moving machine parts, both of which could cause injury.	Chains, sprockets, direct push rod assembly and moving parts will be guarded. Workers will not wear loose clothing or any jewelry. Workers will not place their hands or any part of their body between the direct push rod and the drill plate. Workers should never place themselves in a position where they can come in contact with the moving rods. The operator will verbally alert all workers and visually ensure that all workers are clear from dangerous parts of equipment before starting or engaging equipment. Workers will avoid contact with any moving parts. Means will be provided to guard against employee contact with moving parts, such as setting up a barricade in perimeter of auger or using an electronic brake activated by a presence-sensing device.	M

AHA #2– Job/Task: Direct Push Soil Boring and Sampling			
Job Steps	**Hazards**	**Controls**	**RAC**
	Workers could injure themselves by cleaning the rods while they are moving	Direct push rods and sampling devices will be cleaned only when they are stopped and in neutral. They will not be restarted until the worker has given a verbal all clear to the operator and the operator has visually determined that the worker is clear of the device. Workers will use only long-handled shovels to remove soil from the direct push rod.	M
	Workers could trip or fall by the borehole.	Cap and flag open boreholes. All open boreholes left unattended will be protected as an open excavation.	M
	Improper IDW management can lead to spills and poor housekeeping	Properly containerize, mark, and label IDW in accordance with the Waste Management Plan so it can be tracked for further sampling and disposal. Keep containers closed unless actively adding waste. Use containers that are in good condition and not rusted, dented, or leaking, with positively closing lids.	L
	Pinch points.	Avoid placing hands close to moving machinery. Wear leather work gloves as appropriate. Keep constantly alert.	M

AHA #2 – Job/Task: Direct Push Soil Boring and Sampling		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Site vehicles	Drivers must have current State-issued driver's license.	Receipt inspection by SS Daily vehicle inspection by operator.
Direct Push Rig	Drivers must have current state-issued driver's license. Only trained equipment operators may operate equipment. Qualified operators will be identified upon assignment. All drillers and driller's helpers must have documented training on use of drill rig and associated equipment.	Receipt inspection by equipment supervisor and SSHO. If serviced or repaired, a copy of the certification by the mechanic that the vehicles meet EM 385-1-1 requirements. Daily equipment inspection by operators. An operator's manual for the drill rig must be available at the job site.
Hand tools	Training in use of power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Remove damaged tools from service and tag out of service or discard.
Monitoring Equipment (e.g. MiniRAE™)	Trained and qualified individuals will operate monitoring equipment either the SSHO or under the supervision of the SSHO	Receipt inspection by SSHO. Daily calibration in accordance with manufacturer specification for all sensors equipped and in use (organic vapors on PID).
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.

Abbreviations and Acronyms:
AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CIH – Certified Industrial Hygienist
CRL – Corporate Reference Library
DGPS – Differential Global Positioning System
EHS – environmental health and safety
EM – Engineer Manual
HAZCOM – Hazard Communication
IDW – investigation derived waste
MSDS – Material Safety Data Sheet
OSHA – Occupational Safety and Health Administration
PID – photoionization device
RAC – Risk Assessment Code
SDS – Safety Data Sheet
SSHO – Site Safety and Health Officer
SS – Site Superintendent
QC – quality control
WBGT – wet bulb globe temperature

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
1.			
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Activity Hazard Analysis (AHA) #3

Job/Task: Installation and/or Removal of Temporary Fencing	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey		
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, class 2 high visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

AHA #3 – Job/Task: Installation and/or Removal of Temporary Fencing

Job Steps	Hazards	Controls	RAC
1. Establish areas where temporary fence will be placed	Exposure to poison ivy or oak.	As area is inspected, identify any "suspicious" vegetation that may be poison oak or ivy. Mark these areas with warning tape or spray paint in preparation for fence removal and/or placement. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves Wear an "ivy blocker" and have Technu® or Zanfel post-exposure washing agent available. These plants need to be removed (if removal is required) carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as the oils can remain on cutting surfaces. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	M

AHA #3 – Job/Task: Installation and/or Removal of Temporary Fencing			
Job Steps	**Hazards**	**Controls**	**RAC**
	Slips, trips, and falls	Pay attention to where you are walking. Locate and mark surface debris that could present a trip hazard. Store and stage tools and equipment properly and follow good worksite housekeeping practices.	M
	Marking paint used to mark fence location (if used) can be an inhalation hazard	Review MSDS/SDS for spray paint before use. Position upwind when spraying paint to mark limits.	L
	Failure to observe and prepare for encounter with insects or rodents could cause injury to worker.	Observe for insects and rodents. Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	M
2. Unload fence materials at location where temporary fence will be installed	Construction equipment could cause injury to personnel (general)	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times vehicle is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear class 2 high visibility vest on ground.	M
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 4 – Hoisting and Rigging, which will be followed in addition to this AHA if hoisting and rigging by means of mobile equipment such as excavator or loader is performed to unload and/or stage equipment and materials.	M
	Slips, trips, and falls while carrying tools and equipment could cause injury	Keep saws in off position when walking to new locations. Ensure you carry saw with blades facing out and away from body so that if you do fall, you do not fall onto saw. Watch your steps.	M
	Improper staging of equipment and materials could lead to shifting of material and injury	Stage materials in an orderly fashion such that they won't shift, fall, or roll unless intended. Follow good housekeeping and ensure paths remain clear around staging areas for personnel and equipment.	M
	Punctures, cuts, scrapes, from handling fence materials	Wear leather work gloves when handling fence materials and tools.	M
	Struck by or against heavy equipment or traffic	Wear class 2 high-visibility safety vests when working on ground in vicinity of powered equipment or in traffic areas. Make eye contact with operators before approaching equipment. Delineate or reroute traffic as required in coordination with NTR and FEAD.	M

AHA #3 – Job/Task: Installation and/or Removal of Temporary Fencing			
Job Steps	**Hazards**	**Controls**	**RAC**
3. Install temporary fence (no concrete pouring required) (anticipated that fence will be prefabricated panel style (versus rolls) chain link with no post hole digging necessary)	Punctures, cuts, scrapes, from fence materials	Wear leather work gloves when handling fence materials and tools.	M
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing protective clothing. Wear broad-spectrum sunscreen lotion of SPF 15 or better.	M
	Workers could experience strains from manually moving materials and equipment especially rolls of chain link (if used).	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting and turning, and getting help when moving bulky/heavy materials and equipment. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Use equipment as much as possible to maneuver heavy or awkward items.	M
	Cuts, scrapes, and hand injuries from handling materials	Wear leather work gloves when handling fence material or tools used to secure sections of fence to posts.	M
	Improper use of tools could cause severe injuries	Ensure that workers are instructed in the proper use of tools and selecting of the proper tool to use for the task of connecting and setting of fence sections. Use tools that are in good condition and take any damaged tools out of service. Wear safety glasses, hard hat, and leather work gloves at a minimum when using tools.	M
	Noise could cause hearing loss while using tools and equipment to install fence.	Hearing protection is required when sound levels exceed 84 dBA continuously. Rotate tasks to avoid long periods of exposure. SSHO to monitor noise levels in work area as required assessing adequacy of hearing protection for users and those in the area who may be performing other tasks.	M
	Fence sections could kick back or fall on worker while securing material to posts	Use team method to install fence and use proper tools for attaching chain link panels to posts. Ensure team is trained on proper fence installation methods and tool use as per manufacturer's installation instructions. Wear leather work gloves, eye and face protection and hard hat. Ensure that fence footings are securely placed and that they are adequately grounded so fence does not topple. If necessary, add sand bags to footers or other means as specified by manufacturer.	M
4. Remove temporary fence materials	Eye injuries during dismantling of fence sections.	Workers will wear safety glasses. Locate a portable emergency eye wash at each work area. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical	M

AHA #3 – Job/Task: Installation and/or Removal of Temporary Fencing			
Job Steps	**Hazards**	**Controls**	**RAC**
		attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt.	
	Improper use of tools could cause severe injuries	Ensure that workers are instructed in the proper use of tools and selecting of the proper tool to use for the task. Use tools that are in good condition and take any damaged tools out of service. Wear safety glasses, hard hat, and leather work gloves at a minimum when using tools.	M
	Noise could cause hearing loss while using tools or operating heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule also applies to personnel working around heavy equipment and when using saws or generator.	M
	Slips, trips, and falls in debris piles from cutting.	All fence debris will be placed into manageable piles to keep potential trip and fall hazards to a minimum.	M
	Sections of metal chain link fence can be hard to manage and heavy and could cause manual strains.	As sections of fence are removed, direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Use equipment as much as possible to maneuver heavy or awkward items. If hoisting and rigging will be used to load materials onto trucks, refer to AHA 4 – Hoisting and Rigging, which will be followed in addition to this AHA.	M
	Workers could be struck by sections of fence when sections are cut away or detached from posts (chain link may recoil)	Ensure that the ends of fence are secured when tension is released (unless pre-fabricated panels are used). Ensure persons that may be in the way move out of the way when tension is released. Ensure that panels are supported when disconnected from posts.	M
	Slips, trips, and falls while carrying tools and equipment could cause injury	Keep saws in off position when walking to new locations. Ensure you carry saw with blades facing out and away from body so that if you do fall, you do not fall onto saw. Watch your steps.	M
	Struck by or against heavy equipment	Wear class 2 high-visibility safety vests when working on ground in vicinity of powered equipment. Make eye contact with operators before approaching equipment.	M
	Failure to observe and prepare for encounter with insects or rodents could cause injury to worker.	Observe for insects or rodents. Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	M

AHA #3 – Job/Task: Installation and/or Removal of Temporary Fencing			
Job Steps	**Hazards**	**Controls**	**RAC**
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing protective clothing. Wear broad-spectrum sunscreen lotion of SPF 15 or better.	M

AHA #3 – Job/Task: Installation and/or Removal of Temporary Fencing		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
1. Vehicles	Drivers must have current state-issued driver's license.	Receipt inspection by SS. Daily and before use by operator. Use equipment safety checklist.
2. Mobile construction equipment	Only trained equipment operators may operate mobile construction equipment.	Receipt inspection by SS. Operator qualification by SS. Inspect all equipment upon arrival at site and on each day of use. Use equipment checklist. Have operations manual onsite and be familiar with proper use of equipment and attachments.
3. Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
4. First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	First aid kits must be inspected weekly as required by OSHA. Fire extinguishers must be inspected monthly. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.
5. Industrial hygiene monitoring equipment (e.g., WBGT)	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy.	Calibration and function checks before use.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CIH – Certified Industrial Hygienist
CRL – Corporate Reference Library
EHS – environmental health and safety
EM – Engineer Manual
mph – miles per hour
OSHA – Occupational Safety and Health Administration
PPE – personal protective equipment
RAC – Risk Assessment Code
SPF – sun protection factor
SS – Site Superintendent
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
UL – Underwriters Laboratories
NTRL – Nationally Recognized Testing Laboratory
WBGT- wet bulb globe temperature index

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #4

Activity/Work Task: Hoisting and Rigging	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**	
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by: Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. This AHA does not address the use of cranes. This AHA addresses the use of heavy equipment that can be configured to lift materials.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, class 2 high visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA #4– Activity/Work Task: Hoisting and Rigging

Job Steps	Hazards	Controls	RAC
1. Operation of heavy equipment	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work	M

AHA #4– Activity/Work Task: Hoisting and Rigging			
Job Steps	**Hazards**	**Controls**	**RAC**
		zones around heavy equipment and must remain visible to the operator. Wear class 2 high visibility vest on ground.	
	Not making this AHA task specific to the lift could result in injury	Refer to AHAs for work tasks in which hoisting and rigging will be performed as part of that task (e.g., mobilization and site setup). Materials being hoisted and the hazards will vary based on what is being lifted and where it is being placed. All hoists and all rigging situations will be unique and must be properly evaluated by the Competent Person (TBD) and the operator of the heavy equipment being used. Tasks in which hoisting and rigging may be performed may in include mobilization and demobilization, drilling support, handling and/or unloading rolls of geotechnical liner, etc. All these tasks have unique hazards to consider in addition to this AHA. This AHA addresses general precautions for performing hoisting and rigging tasks and is intended to be updated as required for specific lifts.	M
	Slips, trips, and falls	Clear area to be worked in of loose debris and trip hazards. Ensure a travel path for rigging team.	L
	Heavy lifting and awkward positions	Team-lift or use material handling devices as required. Use good posture when lifting or moving materials. Do not self-lift more than 50 pounds alone. Avoid jerking movements or rotating at waist while walking.	L
3. Rigging and hoisting operations	Improper hoisting and rigging experience and training could result in injuries to workers or equipment damage	The hoisting and rigging competent person, (TBD) will oversee all use of rigging and all hoisting operations performed onsite on a task specific basis. Persons performing equipment operation and rigging tasks will have written proof of qualifications for these tasks. The subcontractor, when required, will provide a qualified rigger to perform the rigging within the EZ when required. This person, when name becomes known, will be added to this AHA as a competent person.	M
	Improper stability of equipment or swing radius could cause equipment failure or damage	The operator will ensure that adequate swing radius for equipment, rigging, and load is established prior to performing the pick. The ground under the hydraulic excavating equipment will be stable and verified sufficient for equipment and load stability. Load charts will be consulted for the lift as applicable.	M
	Failure of rigging or equipment used to perform the hoist could result in injury or equipment damage	Operational testing will be performed as required by EM 385 1-1 Section 16.S.03.b. This testing will be documented by the competent person. More than one test may be required depending upon the materials being hoisted and the rigging being used (e.g., trench box vs. drum). All equipment used for hoisting will meet the manufacturer's guidelines	M

AHA #4– Activity/Work Task: Hoisting and Rigging			
Job Steps	**Hazards**	**Controls**	**RAC**
		for use in performing hoisting tasks (or the equipment will not be used for this purpose). All operating procedures will be per the manufacturer's operating manual, including, authorized factory installed connecting point (eyes and hooks), load rating capacities and charts if required. If load capacity is within 75 % of capacity, a larger piece of equipment or another means of lifting will be provided. Never allow persons to be positioned under a suspended load.	
	Improper or damaged rigging could cause injury or loss of load	Only positive latching devices will be used to secure the load and rigging. All rigging used to perform the hoist will be inspected by the competent person to ensure it is properly rated, is in good condition, and is properly configured for the lift. Taglines will be used to control the load being hoisted and moved as necessary to control the load movement.	M
	Setting up of rigging could lead to cause pinch points, cuts, or scrapes	Ensure neutral configuration of rigging and slack in rigging before attaching straps. Ensure communication with operator before attaching rigging so that boom and bucket on excavator are not engaged. Wear leather work gloves. Watch out when running hands underneath or on equipment or materials due to sharp edges or pinch points. Wear leather work gloves when handling rigging and materials.	M
	Improper communications and planning could lead to confusion and errors in the pick	The rigger and the operator will be in visual and verbal communication. Standard and recognized hand signals will be used for communication. Rigger and operator to verify that non-involved persons are clear of the load (not underneath or in swing radius). Lift will not occur until rigger notifies operator to do so.	M
	Release of rigging could lead to cause pinch points	Ensure neutral configuration of rigging and slack in rigging before releasing straps. Ensure communication with operator before removing rigging so that boom and bucket on excavator are not engaged. Wear leather work gloves.	M

AHA #4 – Activity/Work Task: Hoisting and Rigging		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Excavator or loader (equipped properly for attachment of rigging)	Trained and experienced operators will operate heavy equipment.	Receipt inspection by SS. Daily inspection by users/operators. Task observation of operators by SS. Ensure equipment meets manufacturer's guidelines for performing hoisting. Have copy of manufacturer's operation manual onsite.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.
Hoisting and Rigging Equipment	Competent person (TBD) is responsible for hoisting and rigging	Initial and before use inspection of equipment and material used for hoisting and rigging, operational testing of the equipment and material.

Abbreviations and Acronyms:

APP – Accident Prevention Plan
SSHO – Site Safety and Health Officer
SS – Site Superintendent
PPE – personal protective equipment

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #5

Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**	
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by: Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Operation of heavy equipment, general; getting set up for excavation start	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment	M

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)			
Job Steps	**Hazards**	**Controls**	**RAC**
		and must remain visible to the operator. Wear high visibility safety vest.	
	Workers and public as well as equipment and vehicles could come into contact with leading excavation edge and could fall into open excavations	Excavation competent person (TBD) will evaluate, install and maintain appropriate barricade systems to protect workers, vehicles, and equipment as well as the public from falls into excavation as required by EM 385-1-1 for during work activities and when excavations are left open and unattended. Establish work zones to keep workers, vehicles, traffic, and the public separate from each other so that potential for contact of persons and equipment is controlled.	M
	Contact with underground utilities in area to be excavated	Perform utility locate, marking, and verification prior to performing intrusive operations. Call National One Call – 811. Contact base to review as-builts and gather further information regarding other potential utility installations. If utilities are present, prepare for appropriate means of avoidance of the utilities and protection/support of utilities in place as excavation proceeds. If possible, work with utility provider to isolate and lock out service (if feasible).	M
	Contact with overhead power lines by excavation equipment mast	Ensure that all overhead utility lines are identified and the voltage ascertained. Mark or flag utility lines as necessary in coordination with the utility service provider. Maintain a minimum clearance of 15 feet from power line (more for higher voltage). Ensure operators are aware of the power lines and can work while maintaining clearance. If possible, work with utility provider and have lines isolated prior to start of work.	M
2. Excavate soil and load out into trucks or reuse stockpiles (as applicable) and work around excavator and soil trucks	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a traffic control plan. Wear reflective high-visibility vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers, as necessary, to direct trucks, as well as any nearby traffic. Ground workers need to stand a safe distance from the excavator, (especially the counterweight). Maintain eye contact with the operator. Be aware of the swing radius of the excavator.	M
	Loading of sidewalls with equipment or spoils could cause collapse of sidewalls	Stage equipment, material, and spoils at least 2 feet from leading edge (3 feet preferable whenever possible).	M

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)			
Job Steps	**Hazards**	**Controls**	**RAC**
	Noise from operating equipment.	Wear hearing protection when working on the ground in the vicinity of the excavator and operating equipment.	M
	As excavation progresses, there is known contamination in underlying soil (TCE) which poses a potential exposure hazard to workers via inhalation and dermal contact.	The SSHO will monitor the workers breathing zones during excavation and trenching at sites where volatile organics could be present using a MultiRAE™ or equivalent PID. Action levels in the APP will be used to establish potential for exposure and to prescribe the proper controls. All field data from monitoring will be maintained and recorded. SS will evaluate depth of excavation to determine level at which contaminated soil is anticipated (at or below buried pipe) based on pre-excavation soil characterization data (via direct push sampling).	M
	Flammable vapors could accumulate in and around the excavation due to presence of TCE in soil and if spark producing work or hot work is performed, could cause fire or explosion ***(no entry into excavations is planned)***	MultiRAE PID or other device with LEL/Oxygen sensor will be available to use to screen work areas to ensure LEL is less than 10% if there will be any spark producing work, open flame, or hot work performed (currently not anticipated). Ensure any hot work, if performed, is done in accordance with TtEC Hot Work Permit and procedures. No smoking unless in designated areas away from the excavation. Avoid hot work or spark producing activities when other means is possible to accomplish the tasks.	M
	Fugitive dust during soil handling or hauling	Dust suppression is available in the form of a water truck with spray/mist capability. This will be used onsite to wet down soil and roadways, laydown areas to keep dusts down as necessary. Cover soil piles on windy days. Trucks hauling soil will be tarped. Clean up any soil that is off-tracked onto roadways. Dump buckets of soil from lowest point possible to the ground. Tracked equipment will not be operated on roadways.	L
	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt.	M

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)			
Job Steps	**Hazards**	**Controls**	**RAC**
	Accidental falls into excavation if the area around the excavation or trench is not properly managed and controlled.	Stay 6 feet away from edge where hazard of 6 feet fall or greater exists. Zones of protection will be marked as required by the competent person (TBD). Excavation will be barricaded as required and also barricaded when left open and unattended. Barricade open excavations as required by EM 385-1-1, 25.B.01.	M
	Cave-in of sidewalls and or undermining of adjacent structures is possible as excavation depth progresses.	Sheet pile will already be installed (separate AHA) when excavation tasks begin to keep the excavation from caving in and to protect adjacent structures from collapse as the excavation progresses in depth and location. Benching and sloping will not be an option for much of the excavation. As required, trench boxes, shields, or other appropriate shoring devices will be placed to prevent sidewall cave-in. Follow the Excavation and Trenching Plan in the APP. ***Note: additional hazards may be identified by the Competent Person requiring this AHA to be updated to address site-specific shoring methods.***	M
	Installation of shoring devices improperly can cause injury to personnel or failure of equipment or rigging.	If construction equipment is used to perform hoisting and rigging and placement of shoring devices or boxes, follow AHA 4 – Hoisting and Rigging in addition to this AHA under direction of the competent person for hoisting and rigging. Ensure that the lifts are properly designed to be within the rating of the equipment and rigging used and that installation of shoring or shielding devices is as required by shielding manufacturer and, if applicable, registered professional engineer as designed. ***Note: additional hazards may be identified by the Competent Person requiring this AHA to be updated.***	M
	Removing of shoring devices improperly can result in cave-ins or can cause injury to personnel or failure of equipment and rigging ***(removal of sheet pile is addressed under separate AHA)***	Refer to hoisting and rigging AHA for this task. Consider that pressure of soil and mud in excavation and sidewalls can add to the loading of the boom and rigging to that involved in placement of the material. Ensure that the load is configured for the additional lifting required to free up and move the loads within the manufacturer's operating load requirements. As shoring devices or box is removed for placement further along the excavation, ensure that adequate protection is provided to stabilize sidewalls and structures to prevent cave-ins and keep workers back from the edge a minimum of 6 feet (or more) at direction of competent person. As excavation progresses along the trench, ensure work is completed as the work progresses to stabilize disturbed areas that will no longer contain a shield.	M

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)			
Job Steps	**Hazards**	**Controls**	**RAC**
		If multiple shields are required at once, ensure systems are compatible with each other as designed. *Note: additional hazards may be identified by the Competent Person requiring this AHA to be updated.*	
	Excavations greater than 4 feet are confined spaces. Entry into excavations without proper precautions poses an immediate hazard to workers who could be exposed to engulfment or cave-in hazards if sidewalls collapse, water hazards if water is present in excavation, or hazardous/toxic atmospheres.	Currently there is no anticipated need to enter any excavation to accomplish any of the excavation work tasks. There is no authorized entry into any excavation that is deeper than 4 feet unless the APP and this AHA is updated to include all required safety precautions, including confined space entry as required and not until the SHM approves of the changes and workers are sufficiently trained. Under oversight and with permission of the excavation competent person, workers may enter shallow excavations less than 4 feet in depth for specific tasks. The Excavation Competent Person (TBD) will evaluate excavations and conduct inspections daily based on depth, soil type and conditions, and other factors related to excavation safety. ***Note: additional hazards may be identified by the Competent Person or SSHO requiring this AHA to be updated to address any additionally identified tasks workers will perform.***	M
	Groundwater could infiltrate the excavation and create additional hazards such as visibility to continue digging, cave-in or sloughing of sidewalls	Excavations will be dewatered by portable pump as necessary to maintain safety of the excavation operation and integrity of the sidewalls. Water will be pumped into an adjacent settling tank where it will be treated onsite prior to disposition.	M
	Contact with potential contaminants in soil and potential spread of contaminants to other areas	Three zones of control will be established for performing excavations in contaminated areas (EZ, CRZ, and SZ). Wear PPE specified in the APP under SSHO direction based on potential for contact with contaminated soil at each site and each worker's task. Appropriate PPE may include disposable coveralls, boots with boot covers (or steel toe PVC boots), nitrile or latex gloves, safety glasses, and hard hat. Avoid stirring up dust. Control dust generation with light water mist to keep visible dust from being generated. Appropriate means of decontamination will be provided for workers exiting the area if boots, gloves, or clothing becomes contaminated with soil. SSHO will determine the appropriate level of decontamination based on site conditions. Workers will keep contact with potentially	L

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)			
Job Steps	**Hazards**	**Controls**	**RAC**
		contaminated soil to a minimum. A hand washing station will be located in the support zone for workers to wash hands before leaving the area to go on break. In addition to workers, any contaminated tools or equipment will also undergo appropriate level of decontamination to prevent the spread of potential contaminants.	
3. Loading of trucks and tarping of trucks hauling soil offsite (soil will be direct loaded into trucks as excavation progresses)	Drivers of trucks could be injured by loads as they are being placed in trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS)	M
	Potential falls during tarping of truck	Workers will not climb trucks to tarp the load. Use automatic tarping devices.	M
	Potential for off-tracking of contaminated soil onto roadways or from losing material from bed of truck.	Truck tires will be cleaned and decontaminated as appropriate before trucks leave site and enter a roadway. Tarp loads before they leave the site.	L

AHA #5 – Activity/Work Task: Excavation and Trenching (including soil direct load out and backfilling)		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Excavator and haul trucks	Trained and experienced operators will operate heavy equipment.	Receipt inspection by SS Daily inspection by users/operators. Task observation of operators by SS.
Water Truck (if used)	Trained and experienced operators will operate the water truck.	Receipt inspection by SS Daily inspection by users/operators. Task observation of operators by SS
Monitoring Equipment (e.g. MiniRAE™)	Trained and qualified individuals will operate monitoring equipment either the SSHO or under the supervision of the SSHO	Receipt inspection by SSHO. Daily calibration in accordance with manufacturer specification for all sensors equipped and in use (organic vapors).
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

Abbreviations and Acronyms:

APP – Accident Prevention Plan
CRZ – Contamination Reduction Zone
EZ – Exclusion Zone
FOPS – Falling object protection system
SSHO – Site Safety and Health Officer
SS – Site Superintendent
SZ – Support Zone
PPE – personal protective equipment
PID – photoionization device
SHM – Safety and Health Manager

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) # 6

Job/Task: Pile Driving and Extraction Using Crane	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**	
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat, safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, class 2 high visibility safety vest. Other PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

AHA #6– Job/Task: Pile Driving and Extraction Using Crane

Job Steps	Hazards	Controls	RAC
Preliminary Activities			
1. Evaluation and design of sheet pile system	Those posed by soil loads, vibrations, adjacent structures, etc.	The sheet piling and piling system components will be evaluated and designed by a licensed and registered professional engineer.	L
2. Site Specific Lift Plan and Site Specific Safety Plan for Pile Driving Operations	Numerous hazards are presented if the site specific conditions and requirements for crane use, hoisting operations, and sheet pile driving activities are not planned for in detail that is site specific and equipment specific.	As outlined in Section 9.20 of the APP, the specialty subcontractor will work with the SS to develop a Lift Plan for crane operations as well as a site-specific pile driving plan prior to beginning tasks which will be a separate deliverable or added to the APP by FCR process. The plan will contain details about the equipment to be used and the methods that will be used for each task (hoisting, pile driving, and pile extraction. The plans will be reviewed by the TtEC SHM and SS and submitted to the Navy for approval.	M

AHA #6– Job/Task: Pile Driving and Extraction Using Crane			
Job Steps	**Hazards**	**Controls**	**RAC**
		After the site specific plan details and methodology are planned, this AHA will be reviewed and updated as necessary to contain any additional hazards and mitigations required if not already addressed herein.	
3. Inspect crane, hoisting and rigging equipment, and pile driving hammer attachment upon arrival and inspect work area Setting up for operations	Failure to inspect equipment could cause injury to workers or damage property	Competent Person (TBD) will inspect equipment using checklist, refer to the operator's manual(s) which must be on site. Use spotters as needed for proper placement of crane and other lift equipment and when ground personnel are in vicinity.	M
	Work area must be carefully evaluated before crane and equipment arrival and setup to ensure staging areas and locations are suitable for staging, are stable, and that overhead lines are identified and marked.	SS and specialty contractor Competent Person (TBD) will evaluate the work area and staging/set up area to ensure hazards are identified and corrected or marked and avoided, including evaluation of areas for overhead lines that could be contacted when setting up the boom of the crane and to ensure that the ground is stable, level, and solid for the loads intended to be placed on it.	M
	Contact with ground personnel and equipment during setup and staging	Establish work zones with signs and barriers to keep personnel and operating equipment as well as the public protected when the two could come into contact. Workers on ground will wear class 2 high visibility safety vests when working around construction equipment. Ensure only necessary personnel are involved in setting up of equipment within the work zone.	M
	Unskilled operators or riggers could damage equipment or injure personnel	Crane operators will be certified in accordance with EM 385-1-1 and any OSHA or State of New Jersey requirements. Only qualified and certified (where required) personnel will operate cranes or perform rigging tasks.	M
Sheet Piling Installation or Removal			
1. Handling, Installation and Removal of sheet pile using crane equipped with vibrating hammer pile driving attachment (***sheet pile will be driven prior to beginning excavation tasks and will be removed after excavation backfill tasks***)	Potential contact with underground utilities could cause release of water, sewage, explosive gases, and electrocution.	Physically verify the location and depth of existing utilities before to starting sheet pile placement through geophysical and utility survey. Use One Call "811" Underground Services Alert, before any disturbance of ground. All public and private utilities must be identified prior to excavation activities. Scan the excavation area with electromagnetic and sonic equipment, as necessary and indicated; mark ground where existing underground utilities are discovered.	L
	Potential contact with overhead power lines by crane boom could cause electrocution	If overhead power utilities are present, verify the voltage of the lines with the utility provider and ensure that a minimum of 15 feet from the lines can be maintained at all times by the boom (more distance may be required depending on voltage) when it is raised, positioned, or used. TtEC has evaluated the location where sheet pile will be installed and has determined that no overhead lines are present in the area where sheet pile will be driven; however the verification of this will still be made upon arrival at site. If present, use of appropriate protective measures – warning lines, spotters, etc.	M

AHA #6– Job/Task: Pile Driving and Extraction Using Crane

Job Steps	Hazards	Controls	RAC
		must be used as appropriate or necessary to maintain protective distance.	
	Equipment could roll out or vibrate out of rigging and fall	Safety shackles with positive locking mechanism are required for percussion and vibratory operations. Rigging equipment must be inspected by the designated operator and/or rigger to observe for deformed, cracked or corroded components, loose bolts and rivets, and properly operating locking mechanism.	M
	Hearing damage from noise exposure, especially during active pile driving tasks	During pile driving operations, noise levels are high and hearing protection must be worn	M
	Struck by or against cranes or equipment being hoisted by cranes	• Wear class 2 high-reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Workers within swing radius or reach of the equipment should always be in visual sight of the operators. • Use trained spotters; spotters are required if personnel cannot be within view of the equipment operator. • Taglines will be used when relocating sheet piling or other materials when it could swing or spin. • Auxiliary or unused crane lines will not be chained off to the superstructure/frame when not in use. • Crane counterweight swing radius must be marked, barricaded or otherwise controlled to prevent personnel from entering the area during crane operation. • No working under a load permitted. • All personnel will be kept out of the area when piling is being hoisted into the leads. • Sheet pile will be hoisted with a closed shackle or other positive attachment to prevent accidental disengagement. • Hammers will be lowered to the bottom of the leads for travel. • Cranes being used to extract sheet piling must be equipped with a load indicating device (LID), unless a vibrating type pulling device is used. • Ground personnel will not stand under the kicker/spotter or directly under, in front of, or closer than 12 feet (or more if required by manufacturer) of the pile hammer when the pile is being driven.	M

AHA #6– Job/Task: Pile Driving and Extraction Using Crane			
Job Steps	**Hazards**	**Controls**	**RAC**
		• The crane operator will be protected by FOPS. • Any rigging performed will be by qualified and designated riggers who are working and in communication with the crane operator	
	Injury from snag hazard climbing on and off equipment and/or ladders and fall hazard	No rings or other loose jewelry allowed at worksite; loose clothing to be secured prior to climbing on and off of equipment; hands must be free (no carrying of articles) when climbing on/off equipment and/or ladders; "3 Point Contact" must be maintained at all times when climbing on and off of equipment	M
	Crane could tip or become unstable.	Cranes will be equipped with stabilization devices (e.g., outriggers, crane mats, etc.) which will be put into place as required by manufacturer for stability on the ground. Load charts will not be exceeded during boom placement and loading. Inspect all equipment daily before use to ensure that proper maintenance is being performed.	M
	Contact of workers with crane or operating equipment	Make eye contact with operator; heavy equipment, including cranes have the right-of-way. Stay clear of operating crane unless you are part of the crane team (e.g., qualified rigger) performing specific team-communicated tasks.	M
	High wind hazard	Crane and other lift equipment may not be operated when winds reach the manufacturer's maximum wind velocity recommendation; At wind speeds greater than 20 mph, the operator, rigger, and lift supervisor will cease operations, evaluate conditions, along with the SS and SSHO, and determine if the lift shall proceed. The determination to proceed or not will be documented in the crane operator's logbook	M
	Hammer of pile driver attachment could disengage suddenly when moved or attached	Pile driver will be equipped with positive and negative restraint device to present accidental disengagement.	M
Additional Hazards			
1. Use of shovels and other tools	Strains from use of tools, such as shovels.	Maintain steady pace when using tools, and take adequate rest periods. If possible, rotate tasks among the workers. Use appropriate tools for the task, and maintain them in good condition.	L
2. Adequate illumination for tasks	Darkness may prevent seeing personnel, contribute to trips and falls.	If work will be underway from one half hour before sunset to one half hour after sunrise, adequate lighting will be established meeting the requirements of EM 385-1-1, section 7.0. Working by flashlight or headlights is not allowed.	L
3. Lightning	Struck by lightning	For lightning conditions, follow the 30-second rule (time between lightning	L

AHA #6– Job/Task: Pile Driving and Extraction Using Crane			
Job Steps	**Hazards**	**Controls**	**RAC**
		strike and thunder) for shutdown of operations. Immediately suspend operations when lightning to thunder time is 30 seconds or less (i.e. in the immediate vicinity) and seek safe shelter (indoors or within a vehicle). Work will not commence until there are no lightning strikes at least 30 minutes after the last lightning/thunder strike within the 30 second range.	
4. Heat and Cold Stress	Potential for heat and cold stress.	As conditions dictate (per TtEC EHS 4-6, Temperature Extremes), workers will be advised of the signals of heat and cold stress and preventive measures. Conditions will be monitored (ambient weather and/or workers) per plan requirements and worker protection regimens implemented as necessary. Implement Heat Stress Prevention Program once temperatures rise above 70 degrees F for workers wearing impermeable clothing and 80 degrees F for general work clothing or as appropriate. Workers will receive awareness training for signs and symptoms of heat related illnesses and cold stress, at appropriate times of the year. Air temperature and humidity will be monitored. Physiological and medical monitoring will be conducted for workers, as necessary or indicated in hot environments.	L
5. When struck by or overhead hazards exist	Potential for "Struck By" overhead hazards during equipment operations and material handling activities	Hard hats must be worn by all operators at all times while operating machinery. "Hard Hat" required areas are those areas with the potential for head injury. All construction areas, including laydown yard areas are considered to be hard hat areas.	M
6. Hoisting and Rigging by mechanical means (e.g., excavator) for unloading or positioning of material or equipment	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 4 – Hoisting and Rigging by Mechanical Equipment, which will be followed in addition to this AHA if hoisting and rigging by means of mobile equipment such as excavator or loader is performed to unload and/or stage equipment and materials.	M
7. Moving, lifting, positioning materials by personnel	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist and turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some workers) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
8. Good Housekeeping	Slips, trips, and falls could lead to injuries	Keep work areas free of debris and equipment in work paths. Follow good housekeeping in work areas. Correct hazards when seen, such as holes or other trip hazards. If they cannot be removed, they must be covered or marked.	M
9. Handling of sharp Objects or Materials	Handling sharp objects or using hand tools or knives could cause cuts, punctures, or scrapes	Wear leather work gloves when handling materials that may be sharp or have sharp edges (e.g., the tie down straps when tying down the trailer). Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons with first aid and CPR training onsite. Never carry a knife in one's pocket. Ensure knives have retractable blades. Cut	M

AHA #6– Job/Task: Pile Driving and Extraction Using Crane			
Job Steps	**Hazards**	**Controls**	**RAC**
		away from the body.	
10. Protection of Eyes	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working onsite. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Use the eyewash for the full 15-minutes, regardless if you feel that the object has been removed. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt.	M

AHA #6 – Job/Task: Pile Driving and Extraction Using Crane		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Crane (specifications to be determined)	Only qualified persons may operate cranes. Operators' manual must be reviewed and be available on-site. Only DMV-licensed personnel will operate truck mounted crane on roadways. Crane operators and riggers must be certified in accordance with EM-385-1-1. Completed Lift Plan and Pile Driving Plan (site-specific) must be in place and approved. (Competent Person is TBD).	Daily and before use. Use inspection checklists. Excavation competent person must be on-site during excavation activities.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual is required. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
Hoisting and Rigging Equipment	Competent person (TBD) is responsible for hoisting and rigging	Initial and before use inspection of equipment and material used for hoisting and rigging, operational testing of the equipment and material.
Personal Protective Equipment	Personnel will be familiarized with the requirements for PPE, including proper donning during safety orientation and daily meetings.	Inspected daily by the users, and periodically by the SSHO
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CFR – *Code of Federal Regulations*
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
CTO – Contract Task Order
dBA – decibels, A-scale
DMV – Department of Motor Vehicles
EHS – Environmental Health and Safety
EM – Engineer Manual
FCR – Field Change Request
FOPS – falling object protective structure
NTRL – Nationally Recognized Testing Lab
PPE – personal protective equipment
RAC – Risk Assessment Code
SHM – Safety and Health Manager
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) #7

Job/Task: Grade and Install New Ditch Drainage System	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**	
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, class 2 high visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA # 7 – Job/Task: Grade and Install New Ditch Drainage System

Job Steps	Hazards	Controls	RAC
1. Place and spread sub-base gravel fill into new grade using heavy equipment such as excavator with bucket, wheel loader, skid steer, and dump truck	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times when equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear class 2 high-visibility vest when working around construction equipment.	M

AHA # 7 – Job/Task: Grade and Install New Ditch Drainage System			
Job Steps	**Hazards**	**Controls**	**RAC**
	Ground workers could come into contact with operating equipment.	Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear class 2 high-visibility vest when working around construction equipment.	M
	Dump truck bed or excavator/loader boom and bucket could strike or come into close proximity to overhead power lines when raised.	The travel path, staging, and other locations where mobile equipment with booms or elevated beds will be operated will be evaluated for overhead lines. The SSHO or SS will establish the required clearance distances that are required and areas to be avoided will be marked and communicated or isolated through coordination with the local utility provider. The voltage of overhead lines must be known in order to ascertain if more than 15 feet minimum clearance is required.	M
	Noise could cause hearing loss while working around operating heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously.	M
	Equipment rollover potential during grading if inclines are present	Operate safely on inclines. Do not exceed manufacturer's safety guidelines for operation on slopes. Operate up and down slopes. All equipment will have rollover protection systems.	M
	Trucks backing could fall on or down slopes of new grade ***(note – excavation will have been backfilled ditch area will not include any vertical sidewalls or grades steeper than 45 degrees).***	Ensure proper stops are in place to stop truck tires at a safe distance from grade where dumping of gravel fill will be made. Use dedicated spotter for any backing operations. All equipment will have rollover protection systems.	M
	Slips, trips, and falls of workers in work area or on slopes	Pay attention to where you are walking. Locate and mark surface debris that could present a trip hazard. Store and stage tools and equipment properly and follow good worksite housekeeping practices. Workers on ground will not walk on slopes that are greater than 45 degrees in the ditch. As long as ditch is considered to be an open excavation, the excavation competent person (TBD) will be present to oversee activities and conduct daily inspections. If the ditch remains an excavation, follow the excavation AHA #5 in addition to this AHA.	M
	Workers could be struck by gravel or become engulfed when gravel is dumped	Workers will not be in the grade below or immediately around the dumping area when gravel is being dumped from trucks. Do not stand behind lift gate of gravel truck when gate is unlatched. Dump operator to verify that workers	M

AHA # 7 – Job/Task: Grade and Install New Ditch Drainage System			
Job Steps	**Hazards**	**Controls**	**RAC**
		are not present prior to commencing dumping activities. Use spotters as appropriate.	
2. Unload crates or packages of pervious pavers from truck and stage/unpack pavers	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 4 – Hoisting and Rigging, which will be followed in addition to this AHA if hoisting and rigging by means of mobile equipment such as excavator or loader is performed to unload and/or stage pallets or crates of pavers.	M
	Handling sharp objects or using hand tools or knives could cause cuts, punctures, or scrapes. Metal banding, if used, can snap and strike workers.	Wear leather work gloves when handling materials that may be sharp or have sharp edges (e.g., the tie down straps when tying down the trailer). Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons (SS, TBD and SSHO, TBD) with first aid and CPR training onsite. Never carry a knife in one's pocket. Ensure knives used to cut open packaging have retractable blades. Cut away from the body. If cutting banding from packages, ensure face and body is out of the way of the band when it is cut – cut at flat angle to band, not sharp point. Bend over sharp edges of banding material to remove sharp ends after cutting. Remove and properly dispose of banding as soon as possible after cut.	M
3. Place True Grid pervious pavers at bottom and sides of grade. (these are large, plastic gridded trays that are laid down side by side, connected, and then filled with gravel)	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear class 2 high-visibility vest when working around construction equipment.	M
	Sharp edges of plastic pavers could cause cuts or punctures.	Wear leather work gloves when handling pavers.	M
	Improper lifting and working positions when moving or placing pavers could cause back injury, strains, or sprains	Unload and place paver packages as close as possible to the point of installation and placement as possible. Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods if loads are awkward or heavier than 50 pounds. Do not bend at the waist, bend at the knees. Do not twist at the waist and turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some workers) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M

AHA # 7 – Job/Task: Grade and Install New Ditch Drainage System			
Job Steps	**Hazards**	**Controls**	**RAC**
	Pinch points when pavers are placed side by side and adjacent to one another	Do not place hands or other body parts between pavers as they are installed into position. If workers are working simultaneously, ensure the placement of pavers is coordinated so that others also have hands and other body parts out of the way.	M
	Pavers, when placed, may be slippery, especially when wet and have cells that might cause ankle to turn until they are filled with gravel.	Use caution walking on pavers and watch where you are walking. Wear sturdy work boots with good soles and traction. Do not carry materials in hands when walking on pavers. Avoid placing feet in or on voids in pavers. Fill paver cells with stone as soon as possible after placement of pavers.	L
4. Place #57 stone and fill cells of the paver grid system using skid steer and bucket and hand tools such as shovels, rakes, and brooms as required.	Ground workers could come into contact with operating equipment.	Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear class 2 high-visibility vest when working around construction equipment.	M
	Noise could cause hearing loss while working around operating heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously.	M
	Ergonomic hazards such as sprains, strains, or back injury from repetitive actions such as using hand tools like shovels, rakes, brooms, etc. to spread stone	Use mechanical equipment when possible rather than by hand and tool methods to place and spread stone in paver cells. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Using hand tools improperly can cause injuries such as cuts, scrapes, punctures, bruises.	Wear leather work gloves when handling materials that may be sharp or have sharp edges. Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons with first aid and CPR training onsite.	M
	Equipment such as skid steer could roll over on slopes	Ensure skid steer is operated in accordance with manufacturer's instructions and limitations on inclines by qualified operators. Operate up and down slopes, not sideways to slopes.	M

AHA # 7 – Job/Task: Grade and Install New Ditch Drainage System			
Job Steps	**Hazards**	**Controls**	**RAC**
5. Place 4-6 inch rip-rap in north end of drainage ditch using equipment such as excavator or skid steer and personnel	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times while equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear class 2 high-visibility vest when working around construction equipment.	M
	Rip rap materials (rock/quarry spall) could shift or drop during placement and injure workers	Rip rap will be placed using heavy equipment, not by hand whenever possible. Workers will not be in area during placement of rip rap by equipment and will not walk up and down on the rip rap materials or position below the slope until they are secure. Rip rap will be placed as specified in the design to minimize potential for failure from the bottom up. Do not place hands or other body parts in between rock in gaps or voids. Wear steel toe leather work boots.	M
	Ergonomic hazards such as sprains, strains, or back injury from repetitive actions and lifting or placing spalls	Use mechanical equipment when possible rather than by hand and tool methods to place and spread spalls. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task. Do not bend at the waist, bend at the knees when lifting. Position spalls at level that reduces need for workers to bend to lift when possible. Do not twist at the waist and turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some workers) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Noise could cause hearing loss while working around operating heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously.	M
6. Tie in roof drain to concrete gutter in restored ditch	Improper use of hand tools when cutting and joining sections	Use the right tool for the job. Inspect tools before use. Do not use defective tools. Workers will be trained in proper tool selection and use.	M
	Improper PPE use could result in cuts and scrapes	Wear leather work gloves when handling gutter ends and when using tools to cut or join sections	M

AHA # 7 – Job/Task: Grade and Install New Ditch Drainage System			
Job Steps	**Hazards**	**Controls**	**RAC**
	If solvents or pipe glue are used to join drain or gutter materials, exposures are possible.	Ensure the MSDS/SDS is available and reviewed to identify any hazards and precautions, including engineering controls and PPE that are required for protection from dermal hazards and inhalation hazards as well as potential flammability of material. Ensure area is well ventilated and materials are only used outdoors. ***This AHA will be updated accordingly for the hazards of the specific hazardous materials used (if used).***	M

AHA # 7– Activity/Work Task: Grade and Install New Ditch Drainage System		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CIH – Certified Industrial Hygienist
CRL – Corporate Reference Library
EHS – environmental health and safety
EM – Engineer Manual
and Health Plan
UL – Underwriters Laboratories
mph – miles per hour
NTRL – Nationally Recognized Testing Laboratory
OSHA – Occupational Safety and Health Administration
PE – Professional Engineer
PPE – personal protective equipment
RAC – Risk Assessment Code
SDS – Safety Data Sheet
SHM – Safety and Health Manager
SS – Site Superintendent
SSHO – Site Safety and Health Officer
SSHP – Site Safety

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #8

Job/Task: Install Piezometers	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey		
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by: Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site or electronically for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, class 2 high visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

AHA #8 – Job/Task: Install Piezometers

Job Steps	Hazards	Controls	RAC
1. Inspect work areas prior to bringing drill rig onsite.	Workers could be injured by slips, trips, or falls in the area	Work areas will be visually inspected and pre existing slip, trip, and fall hazards will be marked, barricaded, or eliminated as is feasible. Work areas will be kept neat and in an orderly state of housekeeping.	M
	Drill rig could contact overhead power lines or other structures if present.	Ensure travel route for rig and rig placement location is free from overhead hazards. If overhead hazards do exist, ensure they are marked on drawings and communicated to the driller. Ensure drill rig does not travel with mast raised. SSHO to work with driller to ensure mast and other equipment maintains adequate clearances at all times if overhead utilities are present and know what the voltage of lines is. The work site and the analysis of the route of travel will be covered at the pre-activity safety briefing along with this activity hazard analysis.	M

AHA #8 – Job/Task: Install Piezometers			
Job Steps	**Hazards**	**Controls**	**RAC**
	Drill rig must set up on solid ground and be leveled	Ensure there are no buried structures below the rig and that the rig is able to level and stabilize, including outriggers, to perform the drilling at each location.	M
	Potential for underground utilities in area of drilling	The proposed drilling area will be evaluated through proper utility locates, marking, and geophysical checks to ensure lack of hazardous utilities. Call National One Call: 811. Review facility as-builts and survey site for indications of previous installed utilities.	M
	Improper inspection of rig could cause workers to be exposed to hazards associated with operating and mechanical devices.	The rig and all associated equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. Equipment will be inspected before use and the beginning of each shift. Faulty or unsafe equipment will be tagged and removed from service. No faulty equipment or damaged items will be allowed in the work area. Verify the emergency shutdown system that consists of trip wires located at the right and left rear of the drill (located on each side – one for the driller and one for the driller's helper). Ensure that each wire shuts down the system when the trip wire is pulled or pushed. Inspect the brakes and tire pressure on the drill rig. Inspect all cables on the rig. Inspect all hydraulic and pneumatic hoses. Ensure outriggers function within full range.	M
2. Drilling operations – set up work area and move rig into position	Failure to set up the work area properly could cause exposure to potential hazards such as electrocution, damaging of underground utilities, or tip-over of rig in unstable soil conditions.	The drilling rig will not be moved into any work area until the work area has been reviewed and the route of travel to any work site has been assessed for hazards (overhead lines, stability of roads and ground).	M
	Damage to existing utilities in vicinity or contact with utilities. Ensure utility locates are performed.	Personnel will contact a service facilities engineer before working near utilities and contact 811 and do private utility locates. Site access is to be provided by client. Ensure that the weight of rig on ground is evenly distributed and is not so heavy as to risk damaging underground lines that may be near the surface. Ensure proper distance from overhead lines.	M

AHA #8 – Job/Task: Install Piezometers			
Job Steps	**Hazards**	**Controls**	**RAC**
	Vehicle may move if not properly set up	Use spotter to properly position vehicle. Set brakes and place wheel chocks under front wheels of mobile rig. Extend stabilizer jacks and ensure that footing is sound. Inspect ground to ensure that it can support the weight of the outriggers. Use cribbing in areas where condition of soil is uneven or soft. Ensure vehicle is level to the vertical and horizontal planes.	M
	When raising mast, rig may not install properly due to the condition of rig and connecting cables.	Inspect all components of rig and mast to determine condition. Make all repairs before raising rig.	M
	When raising rig, mast could come in contact with, or close proximity to, overhead power lines, causing electrocution of workers.	Mast and other equipment must be at least 15 feet from any overhead utility lines. Verify the voltage of any overhead power lines. If any lines are above 50 kilovolt (kV), the clearance distance must be greater than 15 feet as required in EM 385 1-1. Do not travel with mast raised.	M
	Worker may become pinned between rig and other truck components or under truck rig if servicing rig from under the truck is required.	When any part of the rig or equipment is in motion, workers will stand a sufficient distance from the moving parts so that the worker is not pinned between the moving parts. Workers will not manually “guide” any moving part of the rig when it is raised up. Workers will not work under the rig or the truck. If work must be done under the truck or rig, the drill crew supervisor will contact the SSHO to ascertain a safe method for lockout of the equipment to ensure that adequate blocking is installed.	M
	High winds could destabilize rig. Mast could act as a conductor during a thunderstorm.	Check weather conditions and forecasts to determine if conditions are acceptable for use of rig. Do not operate the rig if winds exceed manufacturer’s recommended tolerances. Never raise a mast in an area where lightning is within 10 miles of rig.	M
	Noise.	Hearing protection will be worn whenever drill rig is in operation.	M
	Pinch points.	Avoid placing hands in places close to moving machinery. Wear leather work gloves as appropriate.	M
	Traffic in area of drilling.	Wear class 2 reflective safety vests. Barricade and mark drilling sites for visibility.	M
	Hazardous materials drillers use onsite could present hazard to workers using them	All hazardous material that the driller will bring onsite to use for the project (including bentonite) will have an MSDS/SDS and inventory will be submitted to the SSHO prior to bringing the material onsite. Crew	L

AHA #8 – Job/Task: Install Piezometers			
Job Steps	**Hazards**	**Controls**	**RAC**
		using any hazardous materials will have had HAZCOM training. Only bring the minimal amount of hazardous material required to do the job onto the site. Provide sufficient PPE to users of the hazardous material as per the MSDS/SDS.	
3. Drilling Operations – start up drill and perform drilling and install piezometers	Pressurized hydraulic lines could rupture, causing release of hot hydraulic fluid. Hot fluid can ignite from contact with engine. Hot fluid can burn workers. Fluid can cause environmental contamination.	Personnel will have been trained in the use of drilling equipment. Inspect all hydraulic lines before placing rig in service. Any damaged hoses or connections must be replaced before unit is used. Immediately shut down the equipment. Do not place body in front of any stream of pressurized fluid. Ensure that first aid kit is readily available to treat injured workers. A spill control kit consisting of shovel, absorbent material, and disposal drum must be available at the drilling location. As quickly as possible, berm the liquid to minimize the area over which the liquid spreads. Manage drill cuttings and fluids in accordance with the Waste Management Plan. Refer to EHS Procedure 6-2 “Drill Rigs” for added safety information.	M
	Contact with or other exposures to potentially TCE-contaminated soils and/or groundwater	SSHO to monitor periodically at borehole and worker’s breathing zone for signs of volatile organic vapors using MultiRAE™ PID with LEL sensor to ensure worker safety and protection from potential contaminants. If contamination is detected, SSHO will recommend additional levels of protection as required such as nitrile gloves, Kleengard or Tyvek suit, and PVC steel toed boots. The APP lists action levels. Drilling crew will wear goggle and face shield if splash hazards exist and raingear as required to keep potential site contaminants off work clothing. Hand washing facility will be nearby for workers to use before going on break. A contamination reduction zone will be established adjacent to the exclusion zone for decontamination.	M
	Air hoses or hydraulic hoses under pressure could suddenly release and whip and hit workers, causing severe injury.	Do not disconnect air hoses and compressors until hose line has been bled. Visually inspect all connection of any lines under pressure. Use safety clamps (whip checks) to connect each side of connection to the other in the event the connection breaks. (The safety clamps will keep the hoses from whipping under the sudden release of pressure.) Tie back or attach hoses wherever possible to minimize the length of hose that could whip around in the event that there is a sudden release of pressure.	M
	Strains from manually moving materials, equipment, and IDW drums.	Personnel will be directed to use proper lifting techniques such as keeping back straight, lifting with legs, limiting twisting, and getting help in moving bulky or heavy materials and equipment. Mechanical equipment will be used as much as possible.	M

AHA #8 – Job/Task: Install Piezometers			
Job Steps	**Hazards**	**Controls**	**RAC**
		Use care when handling augers or drill rods. Avoid standing under any load. Get help for lifting any item that weighs 50 pounds or more.	
	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust.	M
	The mast could be used to lift other objects as it is being raised, causing potential failure of the mast.	Masts shall only be used in a manner specified by the manufacturer and should never be loaded beyond their capacity.	M
	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure adequate drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner. EHS 4-6, Temperature Extremes, will be implemented by the SSHO.	L
	Workers could climb drill mast and expose themselves to a fall hazard.	Climbing on the mast is not allowed.	M
	Workers could place hands into moving parts of the rig, or loose clothing could become entangled in moving machine parts, both of which could cause injury.	Chains, sprockets, and moving parts will be guarded. Workers will not wear loose clothing or any jewelry. Workers will not place their hands or any part of their body between the drill auger or rod and the drill plate. Workers should never place themselves in a position where they can come in contact with the moving drill rods or augers. The operator will verbally alert all workers and visually ensure that all workers are clear from dangerous parts of equipment before starting or engaging equipment. Workers will avoid contact with any moving auger. Means will be provided to guard against employee contact with auger, such as setting up a barricade in perimeter of auger or using an electronic brake activated by a presence-sensing device.	M

AHA #8 – Job/Task: Install Piezometers			
Job Steps	**Hazards**	**Controls**	**RAC**
	Workers could injure themselves by cleaning the augers while they are rotating.	Augers will be cleaned only when they are stopped and in neutral. They will not be restarted until the worker has given a verbal all clear to the operator and the operator has visually determined that the worker is clear of the auger. Workers will use only long-handled shovels to remove soil from the auger.	M
	Workers could trip or fall by the borehole.	Cap and flag open boreholes. All open boreholes left unattended will be protected as an open excavation.	M
	Improper IDW management can lead to spills and poor housekeeping	Properly containerize, mark, and label IDW in accordance with the Waste Management Plan so it can be tracked for further sampling and disposal. Keep containers closed unless actively adding waste. Use containers that are in good condition and not rusted, dented, or leaking, with positively closing lids.	L
	Pinch points.	Avoid placing hands close to moving machinery. Wear leather work gloves as appropriate. Keep constantly alert.	M

AHA #8 – Job/Task: Install Piezometers		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Site vehicles	Drivers must have current State-issued driver's license.	Receipt inspection by SS Daily vehicle inspection by operator.
Direct Push Drill Rig	Drivers must have current state-issued driver's license. Only trained equipment operators may operate equipment. Qualified operators will be identified upon assignment. All drillers and driller's helpers must have documented training on use of drill rig and associated equipment.	Receipt inspection by equipment supervisor and SSHO. If serviced or repaired, a copy of the certification by the mechanic that the vehicles meet EM 385-1-1 requirements. Daily equipment inspection by operators. An operator's manual for the drill rig must be available at the job site.
Hand tools	Training in use of power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Remove damaged tools from service and tag out of service or discard.
Monitoring Equipment (e.g. MultiRAE™)	Trained and qualified individuals will operate monitoring equipment either the SSHO or under the supervision of the SSHO	Receipt inspection by SSHO. Daily calibration in accordance with manufacturer specification for all sensors equipped and in use (organic vapors on PID).
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.

Abbreviations and Acronyms:
AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CIH – Certified Industrial Hygienist
CRL – Corporate Reference Library
EHS – environmental health and safety
EM – Engineer Manual
HAZCOM – Hazard Communication
IDW – investigation derived waste
MSDS – Material Safety Data Sheet
OSHA – Occupational Safety and Health Administration
PID – photoionization detector
RAC – Risk Assessment Code
SDS – Safety Data Sheet
SSHO – Site Safety and Health Officer
SS – Site Superintendent
QC – quality control
WBGT – wet bulb globe temperature

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) #9

Job/Task: Site Restoration (including seeding)	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**	
Contract Number: N62470-13-D-8007		
Date Prepared: January 2015		
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist		
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager		

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**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

AHA #9 – Job/Task: Site Restoration (including seeding)

Job Steps	Hazards	Controls	RAC
1. Remove materials and equipment from work areas and consolidate for offsite removal and demobilization, including erosion controls (after site stabilization has been achieved).	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear high-visibility vest when working around construction equipment.	M

AHA #9 – Job/Task: Site Restoration (including seeding)			
Job Steps	**Hazards**	**Controls**	**RAC**
	Noise could cause hearing loss while using saws or working around operating heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously.	M
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 4 – Hoisting and Rigging, which will be followed in addition to this AHA.	M
	Workers could experience strains from manually moving materials and equipment.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Use equipment as much as possible to maneuver heavy or awkward items.	M
	Slips, trips, and falls	Work areas can be slippery and materials can be in the way. Use caution when walking on slopes and especially when carrying tools as falls with tools can injure the person. Follow good housekeeping practices with materials in the worksite.	M
	Punctures, cuts, scrapes, from cutting and removing materials	Wear leather work gloves when handling cutting tools and removing temporary fence posts. If knives are used, they will be retractable blade. Never carry a knife in a pocket on one's body. Always cut away from the body. Do not allow posts to remain in place after removal of materials as these are puncture hazards. Identify and avoid pinch points. Maintain communication with others involved in material handling.	M
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing protective clothing. Wear broad-spectrum sunscreen lotion of SPF 15 or better.	M
	Exposure to poison ivy or oak.	Look for and avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves Wear an "ivy blocker" and have Technu® or Zanfel post-exposure washing agent available. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	M
	Failure to observe and prepare for encounter with insects or rodents could cause injury to worker.	Observe for insects or rodents. Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	M

AHA #9 – Job/Task: Site Restoration (including seeding)			
Job Steps	**Hazards**	**Controls**	**RAC**
	Workers could be injured by high winds of sudden storms.	Ensure that all debris/materials are secured. Shut down operations when wind speed is greater than 25 mph sustained or lesser based on potential hazards (e.g., tree limbs could fall) or lightning within 10 miles. Monitor the local weather report daily and as necessary for any severe weather warnings. Know the procedures to follow in the event of severe weather emergencies. Have a lightning detector on hand.	M
	Eye injuries with dust or debris	Workers will wear safety glasses. Locate a portable emergency eye wash at each work area. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust on roads.	M
	Use of hand tools such as shovels, hammers, and rakes improperly could cause injuries	Use the right tool for the job. Inspect tools before use. Do not use defective tools. Wear gloves when using any pounding tools or shovels and rakes.	M
2. Backfill and compact soil over disturbed areas to meet intended grade at site (where applicable)	Construction equipment or dump trucks hauling, moving, or compacting soil could cause injury to personnel on the ground	Workers operating construction equipment or dump trucks will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Wear high-visibility vest when working around construction equipment.	M
	Equipment rollover potential	Operate safely on inclines. Do not exceed manufacturer's safety guidelines for operation on slopes. Operate up and down slopes rather than across slopes. All equipment will have rollover protection systems.	M
3. Broadcast seed in disturbed areas	Inhalation of fertilizer or contact with fertilizer mixture in seed or lime	Review MSDS/SDS with work crew for fertilizer and lime (or hydroseeding mixture). Wear leather work gloves when handling seed mixture and lime. Avoid inhalation of dust during mixing of seed and fertilizer and avoid skin contact. Brush off material if it gets on you, followed by washing of skin, including arms and hands after use with soap and water. Do not allow lime to become wet or stay on skin as sweat can cause it to hydrate and become	M

AHA #9 – Job/Task: Site Restoration (including seeding)			
Job Steps	**Hazards**	**Controls**	**RAC**
		caustic, which can cause burns. Broadcast from upwind direction and do not broadcast toward anyone. If hydroseeding methods are used, a qualified and experienced subcontractor will be used to broadcast seed mixture.	
	Dust or particles, including lime could enter one's eye during broadcasting	Broadcast downwind and never upwind. Wear safety glasses. Locate emergency eyewash in area where this material will be handled. Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt.	M

AHA # 9– Activity/Work Task: Site Restoration (including seeding)		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used
Industrial hygiene monitoring equipment (e.g., WBGT)	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy.	Calibration and function checks before use.

Abbreviations and Acronyms:
AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CIH – Certified Industrial Hygienist
CRL – Corporate Reference Library
EHS – environmental health and safety
EM – Engineer Manual-
NTRL – Nationally Recognized Testing Laboratory
OSHA – Occupational Safety and Health Administration
PE – Professional Engineer
PPE – personal protective equipment
RAC – Risk Assessment Code
SPF – sun protection factor
SS – Site Superintendent
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
UL – Underwriters Laboratories

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) #10

Activity/Work Task: Demobilization and Waste Disposal	**Overall Risk Assessment Code (RAC) (Use highest code)**					**M**
Project Location: Site 1 Removal Action, Former Naval Air Warfare Center Trenton, Ewing Township, New Jersey	**Risk Assessment Code (RAC) Matrix**					
Contract Number: N62470-13-D-8007	**Severity**	**Probability**				
Date Prepared: January 2015		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by: Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	**H**	**M**	**M**	**L**	**L**
	Negligible	**M**	**L**	**L**	**L**	**L**

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

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, class 2 high visibility safety vest.

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 is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA #10 – Activity/Work Task: Demobilization and Waste Disposal

Job Steps	Hazards	Controls	RAC
1. Staging materials and loading materials for transfer offsite including removal of site trailer	Vehicle operations from Tt or other tenant operations and transport vendors could cause injury to personnel or others onsite	Workers operating company vehicles will have a valid state issued driver's license. Any Commercial Driver's License (CDL) truck and trailers will be operated by CDL qualified drivers. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times vehicle is in operation. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear class 2 high visibility vest when working around operating vehicle traffic. Coordinate with NTR and FEAD as required to identify travel and traffic patterns.	M

AHA #10 – Activity/Work Task: Demobilization and Waste Disposal			
Job Steps	**Hazards**	**Controls**	**RAC**
	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Wear class 2 high visibility vests when working around construction equipment.	M
	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist. Use your feet to turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some workers) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Slips, trips, and falls could lead to injuries	Keep work areas free of debris and equipment in work paths during the move. Follow good housekeeping in work areas. Correct hazards when seen, such as holes or other trip hazards. If they cannot be removed, they must be marked.	M
	Electrical hazards during disconnect from trailer power and other use of cords or generators for temporary power.	All electrical disconnects will be done by a certified electrician. Ensure that power cords are inspected and in good condition for use, that GFCIs are used properly, and portable generators are not overloaded. Ensure any power tools used are in good working condition and have third prong on cord or are double insulated. All live work requires arc flash protection. Contact SHM if there will be any live work so that additional precautions can be identified and incorporated into this AHA.	M
	Handling sharp objects or using hand tools could cause cuts, punctures, or scrapes	Wear leather work gloves when handling materials that may be sharp or have sharp edges. Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons (SS, TBD and SSHO, TBD) with first aid and CPR training onsite.	M
	Construction equipment could strike overhead power lines	The travel path, staging, and other locations where mobile equipment with booms will be operated will be evaluated for potential overhead lines. The SSHO will establish the required clearance distances that are required (minimum of 15 feet) and areas to be avoided will be marked and communicated. The voltage of power lines must be known to determine if greater than 15 feet clearance is required.	M
	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP and implement EHS 4-6, Temperature Extremes during the project. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure	L

AHA #10 – Activity/Work Task: Demobilization and Waste Disposal			
Job Steps	**Hazards**	**Controls**	**RAC**
		adequate drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner.	
	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Wash eye for 15 minutes. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust.	M
	Wind could make materials hard to handle	Avoid handling materials that could respond like a sail (e.g., plywood) in wind. Position vehicles so that doors do not get caught by the wind when opened. Hang onto door when opening and closing in high wind. Open and close doors carefully in the wind and only open one door at a time. Evaluate shutting down tasks if winds exceed 25 mph and are presenting a hazard.	L
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 4 – Hoisting and Rigging, which will be followed in addition to this AHA.	M
	Noise could cause hearing loss and make it hard to communicate	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working near or on heavy equipment and any other sources of loud noise.	M
	Lack of proper illumination in work areas could cause hazards to not be recognized or eye strain	During demobilization, if lighting has been disconnected, temporary lighting such as portable bright lumen flashlights may be necessary if ambient lighting is not sufficient, especially within the field office. Work during daylight hours or provide adequate lighting source for work areas to minimize potential for injuries to occur from lack of visibility.	L
	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment, shipping container, building, etc. where there is exposure to a fall of 6 feet or greater (no proper guarding and rails in place) without a means of fall protection designed by a Competent Person. At the present time, there is no fall protection plan in place to cover this task. A fall protection plan would need to be developed and implemented prior to doing the activity.	M
	Head injuries from struck by or falling objects	Wear hard hat when overhead hazards exist and when working in areas with operating construction equipment.	M

AHA #10 – Activity/Work Task: Demobilization and Waste Disposal			
Job Steps	**Hazards**	**Controls**	**RAC**
2. Load out of waste	Construction equipment could strike overhead power lines	The travel path, staging, and other locations where mobile equipment with booms will be operated will be evaluated for potential overhead lines. The SSHO will establish the required clearance distances (minimum of 15 feet, more for higher voltages) that are required and areas to be avoided will be marked and communicated.	M
	Eye injuries from dust or debris or struck by objects, fugitive dusts	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust. Truckloads must be tarped before leaving the site.	L
	Fall hazards (falls from truck or equipment)	No person will climb upon any equipment or up on or near dump truck bed where there are no hand rails or ladder. Tarping will be done via mechanical tarp deployers on the truck rather than by operator climbing up on loads.	M
	Construction equipment and trucks could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times equipment is in operation. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Wear class 2 high visibility vest when working around construction equipment and vehicles.	M
	Vehicle operations from Tt or other tenant operations and trucks could cause injury to personnel or others onsite	Workers operating company vehicles will have a valid state issued driver's license. Any Commercial Driver's License (CDL) truck and trailers will be operated by CDL qualified drivers. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt at all times equipment is in operation. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear class 2 high visibility vest when working around operating vehicle traffic. Coordinate with NTR and FEAD as required to identify travel and traffic patterns.	M
3. Waste transport and disposal	Improper loading or securing of loads could lead to spill, damage, or injury	The transporter picking up the waste will be contacted to waste containers provided are proper for the site wastes. Loose loads will be covered before leaving the site. Drums, if loaded, will be secure to prevent shifting or falling during load and transport.	M

AHA #10 – Activity/Work Task: Demobilization and Waste Disposal			
Job Steps	**Hazards**	**Controls**	**RAC**
	Improper disposal of waste.	TtEC and subcontractor personnel will not sign manifests unless contractually designated to do so. All project wastes are anticipated to be nonhazardous wastes but must be properly characterized for disposal and manifested to correct facility. Navy representative signs all waste documentation.	L

AHA #10 – Activity/Work Task: Demobilization and Waste Disposal		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

APP – Accident Prevention Plan
EHS – Environmental, Health, and Safety
MSDS – Material Safety Data Sheet
OSHA – Occupational Safety and Health Administration
NRTL – Nationally Recognized Testing Laboratory
SSHO – Site Safety and Health Officer
SS – Site Superintendent

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
1.			
2.			
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APPENDIX B

CORPORATE SAFETY AND HEALTH POLICY STATEMENT

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STATEMENT OF SAFETY AND HEALTH POLICY

TtEC is committed to ensuring the health, safety, and well-being of our employees and the communities in which we work, enhancing and protecting the environment, and providing quality services to our clients. Our Environmental, Safety, and Quality (ESQ) Policy provides the framework and underlying principles for our Environmental Management System and is an integral part of how we conduct business.

All TtEC associates have the right to work in a safe and healthful workplace as well as the responsibility to help create and work in a safe and environmentally protective manner:

- We will complete our work successfully, with a great deal of attention to health and safety by:
  - Incorporating pollution prevention and loss prevention principles into our work process.
  - Employing well-trained personnel who understand and have the knowledge to fulfill their ESQ responsibilities.
- We will fully comply with all laws and regulations pertaining to our business, as well as, company policies and procedures.
- We will commit ourselves to complying with the terms of our contracts and to meeting the four project objectives—knowing scope, budget, schedule, and level of quality.
- We will provide the level of quality our internal and external clients expected and pay for and use its attainment as our measure of success.
- We will safely and properly plan our work and work our plan.
- We will communicate and document the execution of our work.
- We will gather data and make decisions inclusively and involve employees and others affected by ESQ decisions inclusively.
- We will dedicate ourselves to continuous improvement by:
  - Establishing and periodically updating ESQ improvement objectives and targets.
  - Recognizing outstanding employee and project ESQ performance.

These commitments are defined in, and are fundamental to, our Client Service Quality®, Do It Right®, and Shared Vision®, Zero Incident Performance® operating philosophies.

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APPENDIX C

EHS PROGRAMS AND PROCEDURES

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Last Revision By: on
Created By: **Jerald Mahurin** on

Purpose: The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right
®
', 'Client Service Quality
®
', and 'Shared Vision
SM
'.

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Sub-Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:		**Document Owner**	Tom DelMastro

1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

3.1 DEFINITIONS

3.2 ROLES & RESPONSIBILITIES

3.3 SAFE OPERATION REQUIREMENTS FOR TOOLS

4.0 GUIDANCE

4.1 ADDITIONAL CONSIDERATIONS

5.0 REFERENCES

6.0 ATTACHMENTS

The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right®', 'Client Service Quality®', and 'Shared

Vision^{SM}.

This procedure applies to all TtEC projects that include a construction, O&M, and/or UXO component, including remediation construction.

3.1 Definitions

3.1.1 Construction Equipment

For the purposes of this procedure, construction equipment shall mean heavy equipment, such as excavators, scrapers, off-road trucks, dozers, road graders, compactors, dredges, and cranes; light equipment, such as skid-steers, forklifts, generators, and light plants; and operating systems such as screens, crushers, conveyors, pugmills, mobile treatment plants, and pumps. Any discussion of construction equipment shall be understood not to include cars, pickup trucks, flatbed trucks, etc. registered for use on public roadways, which shall be called vehicles hereinafter. Also for the purposes of this procedure, construction equipment shall be synonymous with Contractor's Equipment, a term also commonly used in the construction industry to designate the types of equipment described above.

3.1.2 Terms

The terms "should, may, and might" as used in statements in this procedure are intended to denote a discretionary consideration; the terms "shall & must" are intended to impose a mandatory requirement. The terms "is, are, & will" as used in statements in this procedure are intended to denote discretionary or mandatory requirements that are addressed in other department/disciplines' procedures. However, nothing contained herein should be interpreted as to prohibit development and approval of project-specific procedures or plans that take exception to mandatory direction presented in this procedure provided that the appropriate level of approval (Executive Vice President of Construction, Business Line Executive Vice President, or the Vice President ESQ Services as appropriate) is obtained for deviations from such requirements.

3.1.3 Tools of the Trade

Specific hand tools and or equipment (e.g., manlifts, trucks, trenchers, and pumps) normally provided by or to workers for the performance of their particular work activity.

3.2 Roles & Responsibilities

3.2.1 Equipment Supervisor

Depending on the project's equipment needs, an individual may be designated as the Equipment Supervisor. Responsibilities of the Equipment Supervisor include:

- Determination of the equipment needs for the project;
- Providing input to the Work Plan concerning equipment;
- Identification of Contract and legal/regulatory requirements for mobilization of equipment on client facilities;
- Submittal of required certifications, inspection reports, and test reports for equipment;
- Arranging for the mobilization/demobilization of equipment in support of the project's schedule, providing required notices, such as mobilization details and dates, and obtaining Contractual or

legally required approvals for mobilization;

- Receipt inspection of equipment arriving at the site, including coordination of any client or third party inspection;
- Coordination with equipment yard personnel or vendors regarding equipment maintenance;
- Ensuring implementation of safe work practices for equipment utilization; and

  Assuring that the return of demobilized equipment is performed in accordance with the terms of the rental/lease/PO agreement and documented correctly, or, for TtEC owned equipment, that the equipment transfer form is completed and coordinated with the Equipment Manager; and
- All other responsibilities as assigned by the Project Manager or Site Superintendent.

3.3 Safe Operation Requirements for Tools

3.3.1 Manual T-Post Drivers

There shall be no use of manual fence post drivers, such as those typically used to drive T-posts, without prior approval from the Project Environmental Safety Manager (PESM) or the Vice President of Construction. Any approval of the use of such a tool shall require the implementation of an Activity Hazard Analysis (AHA) to identify and control the hazards presented by the tool. The AHA shall address appropriate PPE and position for the task in order to avoid injury to the worker.

3.3.2 Tools

The Site Superintendent shall determine the nature and quantity of tools required for the construction effort and shall ensure that adequate tools are provided in support of the schedule.

Tools may be assigned to workers or crews for the duration of their activities and shall be stored in gang boxes or other secured storage areas when not in use.

The Site Superintendent may designate certain tools to be issued from a tool control area on a daily basis. These tools should be signed out at the beginning of the work, returned to the tool control area at the end of the work, and signed back in.

3.3.3 Worker Provided Personal Tools

Workers may be required to provide personal tools of the trade for their particular work. Master mechanics, for example, may be required to provide tools required for repairs and maintenance of construction equipment and vehicles. Requirements for workers to provide their own tools shall be established based on the project requirements and shall be discussed at the Pre-Job Conference to be held in accordance with the requirements of the Labor Relations Guidelines LR-8, Pre-Job Conferences.

Any worker required or offering to provide personal tools shall be required to present a list of personal tools being provided upon reporting to the project site. The Site Superintendent shall inventory the tools against this list for verification that all listed tools have been provided. The list shall then be maintained for use in performing an inventory of the tools when the worker is to leave the site at the end of the worker's assignment and shall be the basis for any claims for loss or damage.

The Site Superintendent shall ensure that any personal tools brought onto the project site receive a safety inspection. The safety inspection shall include as a minimum, the items addressed in Section 3.3.4 of this procedure.

The Site Superintendent should ensure that secure, lockable facilities are provided for the storage of worker provided personal tools.

The worker shall be responsible for notification of lost or damaged tools immediately on discovery of the loss. The limits of the project's liability (if any) for loss or damage to personal tools provided by the workers should

be established at the Pre-Job Conference.

Use of personal tools, other than addressed above, either by manual or by TtEC nonmanual personnel, should not be allowed except as specifically authorized by the Project Manager or Site Superintendent. Project personnel should be notified that TtEC will not be liable for any theft, loss, or damage of unauthorized personal tools on the project site.

3.3.4 Tool Safety Inspection

OSHA 29 CFR Part 1926 Subpart I Tools – Hand and Power provides guidance for tool safety. All tools shall be inspected for the following minimum features by the person using the tool prior to starting the work:

- Proper general condition of tools, electrical cords, and air hoses;
- Presence and serviceability of guards and safety devices;
- Proper electrical grounding or double insulation protection;
- Power tools properly equipped with constant pressure switches;
- Tool retainers installed on pneumatic tools;
- Proper adjustment of the tool; and
- Confirming that the load rating of the tool is sufficient for the work to be performed.

Unsafe tools shall be removed from service and the Site Superintendent advised of the condition for corrective action. An Out of Service tag should be placed on all unsafe or defective tools to prevent their inadvertent use by others. These tools should be physically segregated from the acceptable tools.

3.3.5 Environmental Safety and Quality Policy Implementation

TtEC's Environmental Safety and Quality (ESQ) Policy, as included in Environmental Management System (EMS), shall be considered in the selection and utilization of construction equipment and vehicles for use in association with TtEC's construction projects.

Selection of the construction equipment and vehicles shall consider relevant TtEC-wide and project-specific significant environmental aspects, objectives, and targets, as defined in EMS and as identified by the Project Manager in the project management planning documents required under Project Initiations/Operations Procedure, PO-1, Project Management Planning.

Selection of construction equipment and vehicles may have significant impacts on the environment, either adverse or beneficial. Proper selection of the size and type of equipment and vehicles can reduce the adverse impacts from their operation.

Project procurement practices for construction equipment, parts, supplies, lubricants, and fuel shall be consistent with the principles of pollution prevention as discussed in the EMS and identified through the TIP process using CRL Procedure PO-2, Task Initiation. (For example, consideration should be given to such factors as rent versus buy options, disposable versus reusable filters, recycled versus virgin oils/fluids, recycling versus disposal of spent fluids and used parts, and fuel efficiency and economy of operation.)

Spent fluids, filters, and used parts shall be recycled to the extent practical, or otherwise disposed of in accordance with the environmental compliance elements of the Work Plan or EHS plan.

Proper utilization of construction equipment and vehicles can also reduce adverse impacts on the environment. (For example, it is TtEC's policy to not allow unattended equipment and vehicles to be left with motors running. This is not only a safety consideration; it reduces adverse environmental impacts and is generally cost effective due to reduced fuel consumption.)

3.3.6 Insurance

The Project Manager shall ensure that all construction equipment, including TtEC-owned or rental/lease equipment, is covered by appropriate insurance policies for the intended use of the equipment. Property insurance on construction equipment is normally arranged by TtEC if TtEC bears the risk of loss or if TtEC is required to arrange such insurance. However, all rented/leased construction equipment valued in excess of $100,000, and all cranes regardless of their value shall be reported to the Administration and Compliance Department via the 'Insurance Request for Leased Equipment' (Attachment 5, and available in Tetra Links and from procurement) for specific inclusion under the TtEC property insurance policy. The procurement representative should be contacted to ensure that this occurs in each case. Notification is not required for equipment valued under $100,000 except when the construction equipment provider requests a certificate of insurance be provided, or the equipment is a crane.

The Project Manager, usually through the designated procurement representative, should ensure that duplicate insurance coverage is not provided through the equipment provider since this will increase the rental rates. In those cases where the provider requires insurance certificates to verify coverage by TtEC, the procurement representative should be contacted to obtain the appropriate documentation.

A Vehicle Insurance Form (available from the Vehicle Insurance Coordinator, Tetra Links or procurement) shall be processed and sent to the Vehicle Insurance Coordinator for all vehicles (leased, rented, or owned) which are registered and operated off jobsites on public highways.

3.3.7 Receipt and Inspection

All construction equipment shall be subject to a receipt inspection by a competent person and any Contract or otherwise required additional person(s) prior to acceptance at the project site. The inspections and tests shall be in accordance with the manufacturer's recommendations. Most vendors provide a form for notation of any existing damage to the equipment to be filled out on receipt. The equipment should be inspected carefully to determine its condition, including any damage, missing or non-functional equipment. The agreement should be used as a basis to determine that everything required (e.g., the equipment, its condition, manuals, spares, documentation of inspections, and certifications) has been provided. All discrepancies should be noted on the form. A pre-inspection of the equipment prior to transport to the Project site should be considered. Particular attention shall be given to the following items:

- All safety equipment and its condition;
- Operator (when provided) certification for the equipment;
- Posted operating and safety instructions;
- All pollution control devices and their condition;
- Safe entry and egress, with steps, ladders, handholds, and platforms provided as required, including safe access to perform routine checks, maintenance, and refueling operations;
- Leaking fluids, such as hydraulic oil, engine oil, transmission fluid, and coolant;
- Deteriorated or cracked hydraulic and coolant hoses which could result in leaks or spills; and
- Presence of the manufacturer operation and maintenance manual.

Equipment or vehicles with deficient conditions relating to safety or protection of the environment shall not be placed into service until the deficiencies have been corrected and documented.

All construction equipment shall be subject to an operational check prior to acceptance at the project site. The operational check should verify that the equipment has the capability to function as intended or as required through the full range of its intended use.

Receipt of construction equipment shall be documented; with a copy of the receipt inspection report provided to the Equipment Supervisor and to the equipment purchase order file. Documentation should include

entries for date and time of receipt, condition of equipment, mileage or engine hours at time of receipt, information on next scheduled maintenance, and a record of operating and maintenance manuals received with the equipment. Photographs or a video record of the equipment on receipt should be taken if conditions are noted that would warrant further documentation.

Construction equipment providers will often include terms and conditions on receipt documentation to be signed when construction equipment is delivered to the project site. **Project personnel requested to sign this receipt documentation shall not sign any delivery forms unless authorized to do so be Legal of the Project Manager. Further, if they are required to sign delivery forms, they shall be instructed to cross out all terms and conditions, on both the front and back of the forms, before signing.** Alternately, the person receiving the construction equipment should enter the following statement in the immediate vicinity of their signature: "In lieu of the terms and conditions set forth on this document, the Original Purchase Order (or appropriate form of agreement) terms and conditions apply to the receipt of this item(s)." These actions are necessary to avoid acceptance of additional or different terms and conditions.

Construction equipment delivered to the project site should be accompanied with operating and maintenance manuals. Cranes and lifting equipment shall include certification of satisfactory completion of annual inspection and have load charts posted in the cab. Additionally, some construction equipment may be supplied with common replacement parts, such as filters and belts, and any specialized tools required for routine operation or maintenance. (i.e. forks, buckets, lift arms, and tool carries) These items should be carefully inventoried upon receipt, and documented on the receipt inspection report. Responsibility for protection and maintenance of the construction equipment shall be verified, and all measures necessary to protect the construction equipment from damage or loss will be instituted in accordance with the agreement, operating, and maintenance manuals or other instructions as appropriate.

Disposition requirements for construction equipment found to not be in accordance with the rental/lease/sale agreement when received shall be confirmed with the vendor immediately.

A sample Equipment/Vehicle Inspection Report is included as Attachment 1 to this procedure.

3.3.8 Protection from Environmental Extremes

Consideration shall be given to the environmental conditions to which the construction equipment will be exposed to during its time at the project site or during transportation. The manufacturer's instructions shall be reviewed and followed to ensure adequate protection from damage due to environmental conditions.

Adequate protection to the construction equipment's cooling system shall be verified by ensuring that the appropriate coolant/antifreeze mixture, as recommended by the manufacturer, has been used.

Appropriate procedures for operating or storing construction equipment, such as water treatment systems, shall be developed in accordance with the manufacturer's instructions. Measures such as draining and venting the system, providing auxiliary heat sources (e.g., heat tape), dry storage, shaft rotation, fluid levels, shall be taken to protect construction equipment subject to damage from environmental conditions.

Manufacturer's instructions concerning periodic operation of construction equipment shall be followed.

A means of ensuring that appropriate protective measures are instituted and performed as required should be implemented through the establishment of site procedures, logs, and/or checklists.

3.3.9 Equipment Inspections

All construction equipment shall be inspected daily (when in use) for safety and operability, including manufacturer's recommended daily inspections. The inspection form/checklist should note any deficiencies for correction and serve as documentation of the inspection performance. The Equipment Supervisor shall be notified of any deficiency immediately. A Daily Equipment Inspection form, a sample of which is included as Attachment 2 to this procedure, should be filled out at the start of the shift and provided to the Equipment Supervisor. Other supplemental forms which may be used in conjunction with Attachment 2 are the

equipment specific "Pre-operation Inspection" and/or "Function Tests" forms, which are normally supplied by the equipment manufacturer. This information is usually found in the equipment's Operation Manual.

Government property control procedures usually require the implementation of a vehicle utilization log for vehicles when used on government projects; other projects should also implement a similar system for logging use of these vehicles. The log should be kept in the vehicle and an entry made for each use, including name of the driver, purpose of the trip, starting mileage, ending mileage, fuel purchased, maintenance performed, and any damage incurred. The log sheets should be transmitted as required in the contract documents and the project's documentation plan. Copies of the log sheets will be maintained and filed as discussed in Section 3.3.12 of this procedure.

A separate Daily Equipment Inspection Report should be filled out for each shift if construction equipment is utilized on multiple shifts.

The Equipment Supervisor should use the information on Daily Equipment Inspection forms to schedule any repairs or preventive maintenance required for the equipment. Equipment with missing or defective safety features should not be put in service until repairs have been performed to bring the equipment into compliance with any applicable TtEC EHS Program and/or regulatory requirements.

Implementation of the daily equipment inspections should be the subject of periodic verification inspections performed by the Project Manager, Site Superintendent, and/or the Environmental and Safety Supervisor (ESS). These periodic inspections should include verification that the required maintenance is being performed in a timely manner to ensure that unsafe conditions or impacts to the environment (e.g., spills, releases, and discharges) are not created by delays in correcting deficiencies noted on the Daily Equipment Inspection Forms.

Rigging equipment, wire rope, nylon or KEVLAR slings and chokers shall be inspected by a competent person prior to use each shift; particular attention shall be paid to the rigging condition and presence of load/certification tags.

Cranes (weight handling equipment) shall be subjected to annual and certification inspections per OSHA guidelines. Mobile and crawler cranes shall be inspected on a monthly basis; a sample checklist form is included as Attachment 3 to this procedure.

Construction equipment to be demobilized shall be given a final inspection, similar to the receipt inspection, to identify and document, by means of written description and pictures, the condition of the equipment as it leaves the project site. Where possible, a concurrent inspection by the vendor is preferred. Additionally, some projects, particularly USACE projects, require a certificate of decontamination prior to the equipment leaving the site.

3.3.10 Operator Qualifications

TtEC employees operating vehicles or construction equipment on public rights of way shall be required to have in their possession a valid driver's license appropriate to the location where the item is being operated and containing the appropriate endorsement for the type of vehicle or construction equipment being operated. A Commercial Driver's License (CDL) may be required for operation of some construction equipment on public rights of way, or as a specific requirement of a client's safety program. In addition, individual states may require specific licenses or certifications for operators of certain equipment, such as forklifts, and hoisting equipment. Additionally, the client's safety program may include license or certification requirements for personnel operating equipment on their property. The contract documents should be reviewed carefully to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan. The Site Superintendent shall verify that the operator possesses the required license(s). Copies of licenses should be maintained in the on-site project employee file.

Any agreements for the rental or lease of vehicles or equipment should be reviewed for any provider's requirements for licensing or certification of operators to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan.

Operators shall be required to demonstrate their proficiency in operating the construction equipment to be assigned to them prior to being allowed to work. Crane operators shall have qualifications for the type of crane to be operated.

Operator proficiency may be demonstrated through a performance test such as those developed by the International Union of Operating Engineers, or by equipment manufacturers such as Caterpillar. These performance tests include exercises developed to demonstrate operator proficiency in various aspects of equipment operation, including daily operator inspections, ability to follow directions, ability to understand equipment limitations and operating guidelines, safety, and productivity. Also included are checklists that assist an observer in evaluating all of the various aspects of equipment operation. Attachment 4 is an example of Operator/Driver Observation Checklist.

Where it is not possible or practical to demonstrate operator proficiency through a performance test as described above, there should be a period of observation of the operator during the initial period of performance, whether the operator is a new employee or a current employee who is being assigned to a different type of equipment than previously operated on the project site. This observation may be performed by a knowledgeable member of the management team or a designated craft employee such as a foreman or steward. The above referenced checklists could be used for this observation in lieu of the performance test.

3.3.11 Refresher Training and Evaluation

Refresher training in relevant topics shall be provided to Crane (as defined by OSHA 1910.180(a) operators, and Powered Industrial Truck (PIT) as defined by OSHA 1910.178(a)(1) operators prior to be allowed to continue operating when:

The operator has been observed to operate the PIT/Crane in an unsafe manner.
The operator has been involved in an accident or near-miss incident.
The operator has received an evaluation that reveals that the operator is not operating the PIT/Crane safely.
The operator is assigned to operate a different type of PIT/Crane; or
A condition in the workplace changes in a manner that could affect safe operation of the PIT/Crane.

An evaluation of each PIT/Crane operator's performance shall be conducted at least once every three years.

Refresher training in relevant topics shall be provided to all other construction equipment operators when:

The operator has been observed to operate the equipment in an unsafe manner.
The operator has been involved in an accident or near-miss incident.
The operator has received an evaluation that reveals that the operator is not operating the equipment safely.
The operator is assigned to drive a different type of equipment; or
A condition in the workplace changes in a manner that could affect safe operation of the equipment.

The employer shall certify that each operator has been trained and evaluated. The certification shall include the name of the operator, the type of equipment, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

3.3.12 Repairs

All construction equipment shall be repaired as necessary and maintained in good working order. Repairs to rented/leased construction equipment shall be in accordance with the terms of the rental/lease agreement. Repairs to rented/leased and TtEC's construction equipment shall be documented and a record of the repairs maintained in the project files. Copies of the repair records are to be forwarded to the equipment yard for TtEC-owned equipment.

Construction equipment with deficiencies noted on the Daily Inspection Report should be repaired promptly.

The Equipment Supervisor, with input from the Environmental and Safety Supervisor as appropriate, should evaluate if a piece of equipment or a vehicle should be removed from service until the deficiency is corrected.

Construction equipment that develops a fluid leak such as engine oil, hydraulic oil, transmission fluid, or coolant shall be removed from service until the deficient condition has been corrected.

Construction equipment with missing or inoperable exhaust systems, including spark or flame arrestors, mufflers, and catalytic converters, shall be removed from service until the deficient condition has been corrected.

Tampering with, removal, modification, or otherwise rendering inoperable any pollution control device on construction equipment shall not be allowed except as specifically authorized by the equipment manufacturer or appropriate authority and the Project Manager or Superintendent's concurrence

Only trained, qualified personnel shall be allowed to repair equipment. The project's Work Plan should address repairs to equipment by designating required actions in the event of an equipment failure.

An Authorization for Capital Expenditure or Lease (AFCEL) is to be completed for all major repair work (i.e., $1500.00 and over) performed on TtEC-owned construction equipment in accordance with Accounting/Finance Procedure AF-8, Fixed Assets. (Note that on some construction equipment, the cost of a specific item, a replacement tire for example, may require the processing of an AFCEL due to the item cost.)

Costs for major repairs, as well as repairs for deficiencies, to TtEC-owned construction equipment shall be charged back to the project releasing the equipment if the need for repairs is identified within 30 days of the equipment's release and removal from a project and there are indications that the repairs are needed as the result of lack of maintenance or failure of the releasing project to otherwise keep the equipment in good working order.

No repair shall be undertaken for damage covered by an insurance claim until the damage is reported to the Administration and Compliance Department and the insurer approves the repairs.

3.3.13 Documentation and Record Keeping

A file shall be established and maintained for each operator which contains documentation that the operator has the proper qualifications, licenses/certificates, and training to perform his/her job function. Records may include training identified in EHS plans (e.g., OSHA, DOT, Waste Management training), vehicle operator licenses, results of site-administered proficiency testing, and any other special licenses/certificates required by state/local law or the client.

A file shall be established and maintained for each piece of construction equipment, and all records relating to that equipment shall be placed in the file, including the Receipt Inspection Report, annual inspections (for cranes), record of the date the equipment was first placed in service, Daily Equipment Inspection records, maintenance records, repair records, record of the last date that the equipment was in service, demobilization inspection report, and the decontamination certificate, if applicable. For ease of retrieval, all records pertaining to pieces of equipment should be maintained in separate folders for each piece of equipment.

Additional copies of inspection reports and records may be required to be maintained in other project files, such as the procurement files and/or the Environmental Health and Safety files, based on the project's Documentation Plan.

The Equipment Supervisor should ensure that complete and accurate record of equipment utilization, including a list of idle equipment, is provided to the Quality Control Site Manager on a daily basis for inclusion in the Quality Control Daily Report.

It may be useful to maintain equipment utilization information on a spreadsheet depending on the size of the project. Information such as equipment mobilization date, date of first use, utilization of equipment by rental

period (for example, if rental rate is based on hourly usage and is billed on a monthly cycle, there should be an entry for the number of hours the equipment was used in each billing period), scheduled equipment release date, actual release date, and demobilization date. This information may be useful in verification of vendor invoices, in review of production rates, for preparation of requests for change orders or equitable adjustment, or for backup for use in support of (or defense against) claims.

Copies of all maintenance and repair records for TtEC-owned construction equipment shall be forwarded to the TtEC Equipment Manager at the regional equipment yard on a periodic basis. This period should be monthly, and in no circumstances should it exceed quarterly. An Equipment Service Form is available from the Equipment Manager. This form shall be used to report unscheduled and preventative maintenance on TtEC-owned construction equipment.

The Equipment Manager produces a spreadsheet for TtEC-owned construction equipment that is distributed to the projects on a monthly basis. The Equipment Supervisor shall ensure that reports of mileage or meter readings and routine maintenance for all TtEC-owned construction equipment and vehicles assigned to the project are provided to the Equipment Manager for inclusion on the spreadsheet on a monthly basis. A Meter/Mileage Reading Update Form, available from the Equipment Manager, shall be used to report the required information.

The Equipment Supervisor should review the availability date included on the spreadsheet for TtEC-owned equipment and vehicles assigned to the project and inform the Equipment Manager of any required revisions to these dates.

The Equipment Supervisor shall complete an Equipment Transfer Report, available from the Equipment Manager, for all TtEC-owned construction equipment and vehicles to be mobilized to, and demobilized from the project. Copies of the Equipment Transfer Reports shall be provided to the Equipment Manager at the regional equipment yard.

There shall be no equipment disposal action (junk or sale) for TtEC-owned construction equipment or vehicles without prior notification and approval from the TtEC President.

4.1 Additional Considerations

4.1.1 Control of Government Property

Activities involving the use of Government property are to be controlled in accordance with Project Initiation/Operations Procedure PO-12, Government Property Control or by specific procedures negotiated with the Client in accordance with the contract's terms and conditions; such procedures shall be consulted where appropriate. Such activities may involve the handling or installation of Government property, whether furnished by the Government to TtEC or acquired by TtEC for use in the performance of work and for which the Government has retained title.

Government property may include construction tools and equipment purchased as a project cost, as well as permanent materials or equipment purchased for incorporation into the work. Project-specific procedures for control of Government property are to address issues relevant to the use, storage, inventory control, maintenance, and/or final disposition of the Government property.

4.1.2 Spill Control and Emergency Response Dedicated Tools and Equipment

The project's Emergency Response Plan, or Emergency Action Plan (refer to the Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness, for discussion of when each is required) is to identify dedicated personal protective equipment and emergency response tools and equipment to be available for an emergency response to a spill or discharge of hazardous material.

Dedicated emergency response tools and equipment are to be segregated and identified for use in emergency response situations. In accordance with the requirements of EHS Procedure 2-1, Emergency Preparedness the use of dedicated emergency response tools or equipment for any other activity is not to be permitted.

4.1.3 Inventory Control

An individual should be designated as the Material Control Supervisor and should be responsible for inventory control of all tools issued from the tool control area. A log should be maintained for all tools issued and should record, as a minimum, the identification by name and employee number of the individual signing out the tool, the date and time the tool was signed out, the intended use of the tool (by area or system), an indication of when the tool is to be returned, and the time and date when the tool is returned.

Inventory control of tools assigned to individuals or crews should be performed on a daily basis as the tools are returned to the gang box or storage area. The crew foreman should be responsible for inventory control of tools assigned to the foreman's crew.

The Site Superintendent should immediately be made aware of any missing tools and should take the appropriate action to investigate and/or replace the missing tools.

4.1.4 Disposition of Tools at Project Completion

The Project Manager should make a determination of the disposition of tools remaining at the end of the project. The project may not be reimbursed by the client for the purchase of tools on certain cost reimbursable and lump sum projects. On other projects, a dollar value for individual tools may establish whether or not the client provides any reimbursement. The terms and conditions of the contract should provide direction as to the required disposition of the tools.

Tools for which the project has been reimbursed by the client are to be dispositioned in accordance with the client's preferences and the contract terms and conditions.

Tools purchased for the project as a project cost, and which are not to be turned over to the client, should be dispositioned by the Project Manager. Means of disposition may include, but not be limited to, declaring the tools surplus, sale of the tools, or providing the tools to another project. The Project Manager should consult with the appropriate Business Line Executive Vice Presidents, concerning disposition of project tools.

TtEC owned tools (i.e., not purchased as a project cost) should be dispositioned by the Project Manager based on consultation with the appropriate Business Line Executive Vice Presidents. Means of disposition of TtEC-owned tools may include, but not be limited to, declaring the tools surplus, sale of the tools, return of the tools to an equipment yard, or providing the tools to another project.

4.1.5 Company-Owned Equipment

TtEC utilizes regional equipment yard(s) for the temporary storage and maintenance of TtEC-owned construction equipment and vehicles when not currently assigned to a project. Available TtEC-owned equipment should be considered for support of a project's construction effort based on an analysis of the benefits to the project and/or TtEC. When evaluating TtEC owned equipment the requirements discussed in 4.1.6 below should be considered when making the equipment selection.

4.1.6 Rental/Lease Equipment

Agreements for rental/lease of construction equipment should be coordinated through an authorized procurement representative to ensure that appropriate terms and conditions are included in the agreement. The Scope of Work for the agreement should be developed and reviewed carefully, including review by the Site Superintendent or Equipment Supervisor for inclusion of sufficient detail in order to clearly define the

scope of work.

The Equipment Supervisor, or requisitioner if there is no designated Equipment Supervisor, should review the terms and conditions of all rental/lease agreements to determine that the following topics are adequately addressed:

- Receipt and return of the rental or leased equipment and any required accessories;
- Inspection and documentation of receipt and release;
- Provision of documentation required to be submitted, such as Occupational Safety and Health Administration (OSHA) accredited inspection reports, NDE reports, test reports (i.e. load test for cranes), typically annual inspections, and wire rope certification.
- Provision of all safety equipment and accessories, as required, such as fire extinguishers, seat belts, Roll Over Protection Structures (ROPS), Falling Object Protection Structures (FOPS), access steps, handholds, platforms, and anti two-block devices and load moment indicator (cranes);
- Provision of documentation demonstrating operator certification;
- Provision of Certificate of Compliance when required, for instance by NAVFAC P-307 Management of Weight Handling Equipment, Appendix P - Contractor Crane Requirements.
- Provision and requirements of routine and non-routine maintenance and repairs, including payment for labor, parts, filters, lubricants, and fluids;
- Documentation requirements for the above maintenance and repairs;
- Disposal/recycling requirements for used parts, filters, lubricants, and fluids;
- Items such as point of delivery, costs of delivery and return, rental charges during idle time, notification requirements for demobilization, and point of return;
- Appropriate rental rate provisions for straight time and overtime;
- Responsibility for damage to equipment;
- Insurance;
- Indemnification (if included);
- Payment for replacement of parts subject to normal wear and tear, such as tires, tracks, cutting edges, and teeth; and
- Documentation requirements required in support of invoices for basic rental rates and overtime rates, as well as labor, parts, filters, lubricants, and fluids.

Rental agreements should be structured to include normal wear and tear on the equipment in the basic rental rate. In all cases, there should be mutual agreement with the equipment vendor as to the condition of the equipment as it is delivered. This should include items such as the life expectancy of the parts subject to wear and tear, their condition on receipt (i.e., percentage of usable life remaining), and the expected condition on return of the equipment. There should be agreement on minor versus major repairs and on what constitutes normal wear and tear. Mutual agreement is essential to mitigate potential claims from vendors for excessive wear and tear.

4.1.7 Mobilization of Equipment

Mobilization of construction equipment may be a long lead time item and may require client or third party involvement or approvals to gain site access, depending on the required equipment. The Site Superintendent or Equipment Supervisor should determine the lead time required, including Contract submittal and advance notice/approval requirements, and plan for the mobilization of equipment to support the project's schedule.

Planning for mobilization of equipment should include a thorough review of Contract requirements for utilization of each equipment and site access requirements.

Documentation of certification, and OSHA compliant annual inspection, load testing, safety devices (e.g., anti two-block) installed, wire rope certification, and operator's certification for cranes (weight handling equipment) should be reviewed prior to initiating mobilization of cranes.

4.1.8 Equipment Maintenance

The Equipment Supervisor should be responsible for administration of a construction equipment maintenance program for the project. A spreadsheet of all TtEC-owned equipment, titled the Status of All Project Equipment, is maintained by the Construction Department providing notification of the scheduled maintenance requirements for each piece of equipment. Either this spreadsheet, or a project specific spreadsheet, should be maintained and statused on a periodic basis. Specific maintenance requirements may also be contained in specific contract negotiated property procedures or in other TtEC corporate procedures.

As construction equipment is received on site, it should be added to the spreadsheet for tracking of the required maintenance.

A review of the scheduled maintenance should be performed for all construction equipment to be used in the Exclusion Zone to determine the desirability of performing any upcoming scheduled maintenance prior to placing the equipment in service. It may be difficult and expensive to perform the maintenance under the conditions required in the Exclusion Zone, or to decontaminate the construction equipment in order to perform the maintenance under clean conditions. When the maintenance of equipment in the Exclusion Zone is anticipated, the Site Superintendent should ensure that qualified personnel are available with the appropriate medical clearances and certifications to work in the Exclusion Zone.

4.1.9 Construction Equipment Safe Operation Requirements

Standards for safe operation of equipment are contained in the documents identified herein, inclusive and in particular of the requirements for safe operation of lifting and rigging equipment and weight handling equipment. The Contract typically will specify certain documents/codes to be followed for the project. Accessibility of the identified documents is provided in section 5.0 References.

The United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM 385-1-1, Chapters 16, 17, and 18, provide guidance concerning the safe operation of construction equipment.

Safe operation of earth drilling equipment is addressed in the Environmental Health & Safety-Program Procedure EHS 6-2, Drill Rigs.

Safe operation of hand and power tools is addressed in OSHA standard 29CFR Part 1926 Subpart I.

Safe operation of cranes, derricks, hoists, elevators and conveyors is addressed in OSHA standard 29CFR Part 1926 Subpart N.

Safe operation of motor vehicles, mechanized equipment and marine operations is addressed in 29CFR Part 1926 Subpart O.

Rollover protective structures and overhead protection is addressed in 29CFR Part 1926 Subpart W.

The American Society of Mechanical Engineers (ASME) provides guidance in the B30 committee volumes – Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings.

The United States Department of Energy (DOE) provides guidance for safe lifting operations in Technical Standard DOE-STD-1090 – Hoisting and Rigging.

The United States Navy publication NAVFAC P-307 – Management of Weight Handling Equipment includes requirements for Contractor Cranes (see appendix P). Navy facilities issue Instructions

specific to particular facilities such as 'NAVSHIPYDPUGET INSTRUCTION 11262.4A' which provides requirements for weight handling equipment at all Navy facilities within the Puget Sound.

4.1.10 Demobilization of Equipment

Construction equipment should be demobilized when no longer required for the work. The Executive Vice President of Construction should be provided with a status of TtEC-owned construction equipment and scheduled release dates in order to coordinate availability of equipment with other projects.

The Project Manager or designee should request demobilization instructions from the Executive Vice President of Construction or designee to determine the location to receive TtEC-owned equipment.

Construction equipment leaving the Exclusion Zone of a remediation construction project will be decontaminated in accordance with the requirements of the Environmental Health & Safety-Programs, Procedure EHS 3-4, Site and Contamination Control, and the site specific EHS Plan.

Individual state regulations may require cleaning of construction equipment leaving a site, not limited to remediation construction, in order to control the spread of microorganisms contained in the soil. Such requirements are to be identified in the project EHS plans.

Please Describe Your Reference Here **Place Your Link in this Cc**

1. Accounting/Finance Procedure AF-8, Fixed Assets
2. ASME B30 committee publications "Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings" available at www.ihserc.com Note that this is a commercial subscription and requires a User ID and Password available from the TtEC Librarian
3. DOE Technical Standard DOE-STP-1090 Hoisting and Rigging available at www.directives.doe.gov (select the Tech Standards tab, select DOE Technical Standards, select Approved Standards and select DOE_STD_1090 from the menu)
4. Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness
5. Environmental, Health & Safety -Programs Procedure EHS 3-4, Site and Contaminant Control
6. Environmental, Health & Safety -Programs Procedure EHS 6-2, Drill Rigs
7. Environmental Management System (EMS)
8. Labor Relations Guidelines LR-8, Pre-Job Conferences
9. NAVFAC P-307 Management of Weight Handling Equipment, Available via http://www.safetycenter.navy.mil/instructions/osh/navfacP307.pdf#search=%22NAVFAC%20P-307%22
10. The OSHA publications below are available at www.osha.gov/ select Regulations, select OSHA Regulations (Standards - 29 CFR), select Part 1926 Safety and Health Regulations for Construction
11. OSHA 29 CFR Part 1926 Subpart I Tools - Hand and Power
12. OSHA 29 CFR Part 1926 Subpart N Cranes, Derricks, Hoists, Elevators and Conveyors
13. OSHA 29 CFR Part 1926 Subpart O Motor Vehicles, Mechanized Equipment and Marine Operations
14. OSHA 20 CFR Part 1926 Subpart W Rollover Protection Structures Overhead Protection
15. OSHA 29 CFR Part 1910.178 Powered Industrial Trucks
16. OSHA 29 CFR Part 1910.180 Crawler Locomotive and Truck Cranes
17. Project Initiation/Operations Procedure PO-1, Project Management Planning
18. Project Initiation/Operations Procedure PO-2, Task Initiation
19. Project Initiation/Operations Procedure PO-12, Government Property Control

Please Provide a Description of the Attachment	Place Your Attachments H
1. Sample Equivalent/Vehicle Inspection Report	CP-7 Att-1 -mod 20090924.do
2. Sample Daily Equipment Inspection Form	CP-7 Att-2 Daily Equip Insp_m
3. Mobile and Crawler Crane Monthly Checklist	CP-7 Att-3 FJ.doc
4. Operator/Driver Task Observation Checklist	CP-7 Att-4 Operator Observati
5. Insurance Request for Leased Equipment	CP-7 Att-5 FJ.doc

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Proprietary Information

TETRA TECH EC, INC.

Equipment/Vehicle Inspection Report

Date: _____ Unit Number: _____ Description: _____

____ Miles or ____ Hours: _____ MFG: _____

Unit to be taken from: _____ to: _____

	Good	Satisfactory	Repair Req.	N/A		Good	Satisfactory	Repair Req.	N/A
1. Tires/Track %[1] _____	☐	☐	☐	☐	17. Interior	☐	☐	☐	☐
2. Brakes	☐	☐	☐	☐	18. Glass	☐	☐	☐	☐
3. Steering	☐	☐	☐	☐	19. Wipers/Review Mirrors	☐	☐	☐	☐
4. Undercarriage	☐	☐	☐	☐	20. Heater/AC/Defroster	☐	☐	☐	☐
5. Suspension	☐	☐	☐	☐	21. Safety Equipment/Belts	☐	☐	☐	☐
6. Engine	☐	☐	☐	☐	22. Signal Lights	☐	☐	☐	☐
7. Drive Train	☐	☐	☐	☐	23. Mounted Equipment	☐	☐	☐	☐
8. Fuel System	☐	☐	☐	☐	24. Mounted Attachments	☐	☐	☐	☐
9. Cooling System	☐	☐	☐	☐	25. Blade/Bucket	☐	☐	☐	☐
10. Electrical System	☐	☐	☐	☐	26. Boom	☐	☐	☐	☐
11. Exhaust System	☐	☐	☐	☐	27. Outriggers	☐	☐	☐	☐
12. Hydraulic System	☐	☐	☐	☐	28. Fire Ext./First Aid Kit[2]	☐	☐	☐	☐
13. Transmission	☐	☐	☐	☐	29. Horn/Backup Alarm	☐	☐	☐	☐
14. Clutch	☐	☐	☐	☐	30. Manufactuer Operating Manual	☐	☐	☐	☐
15. Body	☐	☐	☐	☐	31. Head/Tail/Brake Lights	☐	☐	☐	☐
16. ROP	☐	☐	☐	☐	32. Cleanliness	☐	☐	☐	☐

[1] Note estimated percentage of tread/track usefulness remaining
2 Fire Ext./First Aid Kit and all items in the cab and or bed must be secured

Comments: _____

Inspected By: _____

DISTRIBUTION: (1) Sent with equipment (2) Equipment Supervisor (3) PO File (4) Originator

EQUIPMENT TRANSFER REPORT MUST ACCOMPANY THIS FORM

TETRA TECH EC, INC.

DAILY EQUIPMENT INSPECTION

PROJECT_____

MANUFACTURER TYPE _____

UNIT #_____MODEL _____ DATE _____

ENGINE HRS/MILEAGE _____ /_____ SHIFT _____

Check appropriate column and describe correction needed.

	If Good (✓)	NA	Correction Needed
Steering Mechanisms[1] *	_____	____	_____
Service Brakes [2]	_____	____	_____
Emergency Brakes[1]			
Parking Brake[1]	_____	____	_____
Transmission & Controls	_____	____	_____
Suspension & Springs	_____	____	_____
Hydraulic Leaks	_____	____	_____
Exhaust System	_____	____	_____
Warning Gauges	_____	____	_____
Windshield[1] & Wipers	_____	____	_____
Lights (Head & Tail)	_____	____	_____
Brake Lights[1]	_____	____	_____
Mirrors	_____	____	_____
Seat and Seat Belts[1] (w/ ROPS)	_____	____	_____
Tires/Tread[1]	_____	____	_____
Regular Horn	_____	____	_____
Audible Back-up Alarm[1]	_____	____	_____
Steps, Hand-holds	_____	____	_____
Fire Extinguisher	_____	____	_____
Engine Coolant	_____	____	_____
Engine Oil	_____	____	_____
Hydraulics & Operating Controls	_____	____	_____
Fenders/Mudflaps	_____	____	_____
Heater/defroster	_____	____	_____
All items in cab or bed secured	_____	____	_____
Cleanliness inside and outside	_____	____	_____

Remarks:

[1] Items required to be operational by OSHA 1926.602 before use.

[2] Service brake must be capable of stopping and holding equipment fully loaded. _____

_____ _____

Operator Name (Printed) Operator Signature

Review : Superintendent _____

Date Repairs or adjustments completed:_____

Equipment Supervisor/Mechanic:_____

TETRA TECH EC, INC.

MOBILE AND CRAWLER CRANE MONTHLY CHECKLIST

Crane Number / ID_____ **Date**_____

Project Name/No:_____

Item	Consideration		Comments
Crane Structure	Cracks, Corrosion, Deformation		
Foundations to support loads	Cracks, Settlement		
Booms	Cracks, Corrosion, Deformation		
Bolts & Rivets	Tightness, Corrosion		
Boom Angle Indicator & Chart	Accuracy, Visibility		
Load Indicator (s)	Accuracy		
Anti-Two Block Device	Functional		
Engine or Motor	Performance & Safety Compliance		
Chain & Sprocket	Wear and Stretch		
Pawls or Dogs	Wear, Cracks, Distortion		
Pins, Shafts & Axles	Wear, Cracks, Distortion		
Bearings & Rollers	Wear, Cracks, Distortion		
Gears	Wear, Cracks		
Tires & Wheels	Excessive Wear, Damage		
Wire Ropes/Lines	Condition, Lay		
Main Drum Brake	Function, Adjustment		
Lining	Excessive Wear		
Drum Braking Surface	Wear, Cracks, Distortion		
Linkage & Pins	Wear, Cracks, Distortion		
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration		
Auxiliary Drum Brake	Function, Adjustment		
Lining	Excessive Wear		
Drum Braking Surface	Wear, Cracks, Distortion		
Linkage & Pins	Wear, Cracks, Distortion		
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration		
3rd, Drum Brake (if any)	Function, Adjustment		
Lining	Excessive Wear		
Drum Braking Surface	Wear, Cracks, Distortion		
Linkage & Pins	Wear, Cracks, Distortion		
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration		
Boom Hoist Brakes	Function, Adjustment		

MOBILE AND CRAWLER CRANE MONTHLY CHECKLIST

Crane Number / ID_____ **Date**_____

Project Name/No:_____

Item	Consideration		Comments
Lining	Excessive Wear		
Drum Braking Surface	Wear, Cracks, Distortion		
Linkage & Pins	Wear, Cracks, Distortion		
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration		
Travel Brake or Locks	Function, Adjustment		
Lining	Excessive Wear		
Drum Braking Surface	Wear, Cracks, Distortion		
Linkage & Pins	Wear, Cracks, Distortion		
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration		
Lead Block	Function		
Hooks	Cracks, Distortion		
Hook, Swivel	Cracks, Wear, Function		
Sheaves	Wear, Cracks, Distortion, Rope Fit		
Computers	Calibrated		
Counterweight System	Attaching Linkage OK		

Print Name Signature

TETRA TECH EC, INC.

OPERATOR/DRIVER TASK OBSERVATION CHECKLIST

Project Name _____ Project Number _____
Operator's Name _____ Observer's Name _____
Date of observation _____ Type/make of equipment operated _____

Operating Safety Observations		S	U	NA	Comments
A.	**Pre-use inspection prior to staring**				
1.	Conducts daily pre-use inspection.				
2.	Mounts & dismounts carefully-3 point contact.				
3.	Uses the seat belt all times while seated. Sounds horn before staring engine.				
4.	Checks equipment warning devices.				
5.	Checks hydraulic systems (if so equipped). Ensures system is filled and free from leakage.				
6.	Checks air system (if so equipped). Ensures all connections are tight.				
7.	Checks engine oil level. Ensures all plugs, filler caps, and other fittings are secure and not leaking.				
8.	Checks for broken, missing, excessively worn or damaged parts, and reports immediately.				
9.	Checks tires. Looks for serious cuts, bulges, irregularities and abnormal wear. Checks inflation pressures and keeps valve caps in place. Checks for tires rubbing.				
10.	For dump trucks, checks front wheel seal oil levels.				
11.	Checks fuel level and for fuel system leaks.				
12.	Coolant check—Should never open a hot system or pour cold coolant into radiator if the engine is very hot.				
13.	For safe visibility, cleans the windshield, mirrors and light lenses.				
14.	For articulating machines, checks to ensure that the steering frame lock or link have been removed and properly stored.				
15.	Checks for and maintains safe access to the cab (3 point contact). For safe mounting, clears the steps, grab rails, and floor and seat of mud and water.				
16.	Secures tools and keeps the floor free of debris.				
17.	For safe operation wipes steering wheel, foot pedals, hand levers and knobs clean of oil and grease.				
18.	Checks first aid kit and fire extinguisher. Reports missing items to the foreman or supervisor.				
19.	Checks equipment for warning tags.				
B.	**Starting**				
1.	Mounts & dismounts carefully-3 point contact.				
2.	Uses the seat belt at all times while seated. Sounds horn before starting engine.				
3.	Checks equipment warning devices.				
4.	Uses job specific PPE (e.g., hard hats, safety shoes, safety glasses, overalls, gloves, traffic vests, and ear protection).				
5.	Ensures the bowl, bucket, etc. is on the ground.				
6.	For starting, checks all controls to be sure they are in proper position.				
7.	Does not crank an electric starter for more than 30 seconds, Allows two minutes to cool prior to next attempt.				
8.	For steering safety, tests before moving. Turns the wheels to full left and full right.				
9.	Checks service and parking breaks for proper operation.				
10.	Checks the backup alarm.				
11.	Ensures head lamps and safety lighting are in working order.				

TETRA TECH EC, INC.

Operating Safety Observations	S	U	NA	Comments
C. Operation				
1. Before moving, places the bucket, bowl, blade, etc., into the transport position and secures all accessory equipment.				
2. Obeys traffic & other posted/published site safety practices & rules.				
3. Maintains control of equipment at all times.				
4. Gives right-of-way to loaded machines or trucks.				
5. Minimizes engine overspeed on downgrades & when shifting.				
6. Does not transport passengers without proper provisions.				
7. Does not engage in horseplay.				
8. Crosses ditches at an angle, proceeding slowly.				
9. Avoids large obstacles, deep holes & soft edges.				
10. Slows down before turning.				
11. Stays in gear on a downgrade.				
12. When running across a hillside, proceeds slowly. Never turns sharply uphill or downhill.				
13. Obeys flagmen & spotter signals.				
14. Maintains safe stopping distance behind other equipment.				
15. Shifting				
a. Always stops the machine/truck and runs the engine at low idle speed to shift from forward into reverse.				
b. Downshifts one speed range at a time.				
c. Applies the retarder and/or service brakes to reduce speed before entering sharp turns, fill areas, and downgrades.				
d. For machines, always leaves the shift lever in neutral position when stopped.				
16. Braking				
a. Avoids applying brake continuously on a downgrade unless system is so designed.				
b. Uses the engine for additional brake force-or, if so equipped, the auxiliary retarder.				
c. Anticipates grade and selects proper gear range accordingly.				
d. Brakes firmly in one application. Avoids fanning the brake pedal.				
e. Uses each brake system only for its intended purpose.				
17. Turning				
a. Does not cut corners too close when making sharp turns.				
b. Maintains engine speed high enough for normal steering.				
c. Downshifts when necessary or appropriate.				
d. For machines, carries the load as low as conditions permit to maintain stability.				
18. Hauling				
a. Regulates speed to road conditions. Reduces speed before turning. Avoids over speeding the engine.				
b. Downshifts when approaching a downgrade. Downshifts when necessary on an upgrade to avoid stalling the engine.				
c. Obeys traffic rules and spotters.				
19. Parking Precautions				
a. Selects level ground whenever possible.				
b. When parking on a grade, positions equipment at right angles to the slope; and sets parking brake if so equipped in addition to lowering bowl, bucket, etc.				
c. Parks a reasonable distance from other equipment.				
d. When parking on haul roads, picks the safest place, where the equipment is visible from both directions.				

TETRA TECH EC, INC.

Operating Safety Observations	S	U	NA	Comments
20. Demonstrates proficiency through smooth operation of controls (e.g., speed of operation appropriate for the conditions, not jerky or hesitant).				
21. Maintains eye contact with other operators, drivers, and ground personnel.				
22. Responds appropriately to signals from flaggers, spotters, operators directing equipment movements.				
23. Stops operation when ground personnel are out of line-of-sight.				
24. Positions and orients machine for safe operation (e.g., safe distance from edge of excavations, tracks perpendicular to excavation, clear distance maintained to fixed obstructions).				
25. Barricades, cones, tape set up to maintain clear zone within swing radius of counterweight.				
26. Maintains safe work area (e.g., windrow at edge of stockpiles, safe slopes).				
D. Shutdown				
1. Lowers the bowl, bucket, etc. to the ground. Lowers and secures the bed on dump trucks.				
2. Reduces engine speed. Sets parking brake.				
3. On machines, places transmission in neutral and locks shift lever if so equipped.				
4. Allows hot engine to cool gradually before stopping it.				
5. Secures equipment to prevent unauthorized starting and movement.				
6. Bleeds the air tanks, if so equipped.				
7. Dismounting—doesn't jump off, uses handrails and steps, and faces the machine/truck when getting off.				
8. Warning tags—attaches appropriate warning tags to steering wheel to prevent accidents.				
E. Overall Appraisal				
Overall appraisal of operator/driver				

S = Satisfactory
U = Unsatisfactory
NA = Non applicable
Note: For unsatisfactory observations also indicate the immediate corrective action taken (e.g., training, verbal or written warning, or reassignment).

Tetra Tech EC, Inc.
Insurance Request for Leased Equipment

FROM: LOCATION:

TO: Dan Fisher LOCATION: Morris Plains

1.	IS THIS ITEM A LICENSED VEHICLE? IF YES, PLEASE PROCESS THE "TTECIVEHICLE INSURANCE REQUEST FORM"	
2.	DATE FORM COMPLETED	
3.	REQUESTOR NAME, PHONE NUMBER AND OFFICE LOCATION	
4.	JOB SITE CONTACT (Name and Phone Number)	
5.	PROJECT NAME	
6.	LESSOR'S COMPLETE NAME AND ADDRESS	
7.	TERM OF THE LEASE (please be specific, i.e., 6/15/98 to 6/15/99)	
8.	TYPE OF EQUIPMENT & SERIAL NUMBER ****Please contact Dan Fisher ASAP regarding insurance for cranes****	
9.	DECLARED VALUE OF EQUIPMENT	
10.	CHARGE NUMBER (FOR VALUE OF EQUIPMENT OVER $500,000)	
11.	HAS LESSOR SPECIFICALLY REQUESTED LOSS PAYEE STATUS? IF YES, PLEASE SPECIFY DATE DUE.	

PO/Subcontract attached ☐
Terms and conditions attached ☐

If guidance is needed, please call Dan Fisher @ (973) 630-8198.
Version 6.

Last Revision By: on
Created By: **Cindy Leong** on

Purpose: The purpose of this program is to: (a) specify the types of events to be reported and investigated, including both safety and quality-related events; (b) define internal Tetra Tech EC, Inc.(TtEC) and external event notification requirements; (c) ensure proper management and follow-up of each
event; (d) meet regulatory notification and investigation requirements; (e) provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.

Status:	Complete	**Approved By:**	John DeFeis
		Title:	Event Reporting and Investigation
Version Date - Type:	12/09/2009 - Revised	**Original Issue Date:**	02/01/95
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub-Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Environmental H&S, EHS Compliance/Spill Reporting, Field Activities/Science, Operational Control, Training, EHS Compliance/Permits, Nonconformance and Corrective and Preventive Action	**Document Owner**	Skip Parry

1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

4.0 GUIDANCE

5.0 REFERENCES

6.0 ATTACHMENTS

1.0 PURPOSE

The purpose of this program is to:

a. Specify the types of events to be reported and investigated, including both safety and quality-related events.

b. Define internal Tetra Tech EC, Inc. (TtEC) and external event notification requirements.

c. Ensure proper management and follow-up of each event.

d. Meet regulatory notification and investigation requirements.

e. Provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.

2.0 SCOPE

Event reporting requirements apply to all operations of TtEC and its subsidiaries (the "Company"), including subcontractor activities. The term "Event Reports" in this procedure encompasses Quality Event Reports (QERs), Near Miss, and EHS Event Reports.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 All Personnel

All personnel shall immediately report any event (see Section 4.1.1) to their supervisor. The report can be verbal or in writing.

Employees, including subcontractors, are required to participate in the investigation process as directed, and comply with corrective actions identified. Employees are also made aware of trends and may be asked to help develop lessons learned to prevent similar events from occurring.

3.1.2 Line Management

Line Management, including the Office Manager for office events and the Project Manager (PM) for project events shall:

a. Be responsible for all client notifications - (Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures).

b. Implement the appropriate internal notifications (see Table 1) as required by this program as soon as an event becomes known.

c. The supervisor responsible for directly overseeing the work shall ensure completion of the Event Report. The supervisor shall directly participate in the causal analysis investigation.

d. Ensure that corrective actions have been completed and properly documented.

3.1.3 Environmental Safety and Quality Personnel

Environmental Safety and Quality Personnel (Environmental Safety Coordinator, Environmental Safety Specialist, and Project Quality Control personnel) shall:

a. Ensure that all notifications are made promptly.

b. Ensure that all reports are fully completed.

c. Ensure that all insurance and workers compensation forms are completed and submitted as necessary.

d. Participate in event investigations of all Occupational Safety and Health Administration (OSHA)

recordable injuries/illnesses, spills, releases, and other investigations.

e. Communicate information about the event to applicable site and/or office employees.

3.1.4 Project Quality Control Manager

The Project Quality Control Manager shall review and approve QER investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The Project Quality Control Manager's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective corrective actions should be elevated to the Director, Quality Programs for further evaluation and potential additional programmatic corrective actions.

3.1.5 Project Environmental and Safety Manager (PESM)

The PESM shall review and approve event investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The PESM's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective correction actions should be elevated to the Director, EHS Services for further evaluation and potential additional programmatic corrective actions.

3.1.6 Director, EHS Services

The Director, EHS Services shall:

a. Notify OSHA of any injuries or illnesses occurring within OSHA jurisdiction as required.

b. Review/maintain log - which includes information on basis causes, immediate causes, and management control issues - of all investigations.

c. Distribute summaries of events with periodic management reports.

d. Communicate significant events to key personnel within the Company.

e. Review basic causes of Company events to identify trends.

f. Recommend EHS program modifications as necessary.

g. Immediately notify the Tetra Tech Health and Safety Manager of any serious accident and provide follow-up information on serious accidents.

h. Provide Monthly Injury Reports to the Tetra Tech Health and Safety Director.

3.2 Notifications

In addition to the reporting responsibilities specified in Section 3.1, the responsible supervisor is required to notify Work Care at 800-455-6155 (available 24 hours) of employee illness or injuries. Work Care's main office must be notified promptly of all injuries and illnesses so the affected employee receives prompt and appropriate medical advice. The call to Work Care must be made in addition to taking the affected employee to the local clinic. EHS 2-1, Emergency Preparedness, provides guidance for medical response and actions.

The responsible supervisor is also required to ensure notifications are made as outlined in Table 1.

The phone numbers and other means of contact for Company personnel shall be posted with the emergency notification list and/or integrated into the site-specific emergency notification list.

3.3 Event Report Generation

The information portion of the Event Report should be generated by the end of the supervisor's work shift on the day of the event, if possible, but no later than 24 hours after the event was reported by the supervisor and employee(s) involved in the event. The investigation completion time is provided in Section 3.4.

The Event Report and Investigation may be completed electronically in the Company Incident Database located on Lotus Notes or by hardcopy using Attachment A, Event Report and Investigation Form, or Attachment B, Quality Event Report Form. (Attachment C, Event Sketch, may be used to graphically depict **events**).

The forms are intended to be self-explanatory. If the supervisor or the employee has any questions regarding completion of the report, an ESQ representative should be contacted for support.

Both the employee(s) and the employee's supervisor must sign the Event Report.

For low loss-potential near misses, the ZIP Slip may be substituted for the standard Event Report. (See CRL Procedure PP-10, Employee Recognition).

3.4 Event Investigations

Event investigations are to be initiated and completed as soon as possible, but should be completed no later than 10 working days after the event has been reported.

Guidance for conducting investigations and cause analysis may be found in Section 4.3.

Table 1. Internal Notifications By Supervisor

EVENT TYPE	SUPERVISOR NOTIFIES...	TIMING[1]	... WHO NOTIFIES	TIMING[1]
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediatel external rep required
	Project Manager	Immediately	Client and Area/Program Manager	Immediatel external rep required
			Government agency if required by contract/plan and Director, EHS Services not available (See 3.5.2)	
Fatality, Hospitalization of 1 or more persons, Fire, or Explosion	ESS	Immediately	PESM and Director, EHS Services	Immediatel
			0 OSHA reporting (See 3.5.1)	Immediatel
			Insurance AIG through Chartis @ 1-800-910-2667 (Company personnel only) (Not required inside Washington State)	Immediatel
	Project Manager	Immediately	Area/Program Manager	Immediatel
			VP Construction	Immediatel
			Client	Immediatel
	ESS	Immediately	PESM and Director, EHS Services	Same day
			Insurance AIG through Chartis @ 1-800-910-2667 (Not required in Washington State)	Same day Same day
Confirmed or Potential OSHA Recordable	Project Manager	Immediately	Area/Program Manager	Same day
			VP Construction, VP Remediation, VP C&E, COO	Same day 24 hours or by contract

			Client, if required	
Equipment/Property/ Vehicle Damage	ESS	Immediately	PESM and Director, EHS Services	24 hours
	Project Manager	Immediately	Client (client property)	Immediatel
			Client (other property, if required)	24 hours
			Equipment Manager	24 hours
			Area/Program Manager	24 hours
			VP Construction	24 hours
Potential Insurance Claim, other than Worker's Compensation	Project Manager	Immediately	Law Department and Procurement	24 hours
Office Events	ESC	Immediately	Operations Manager Director, EHS Services	24 hours
Quality Events	Project Manager	Immediately	Program or Operations Manager	24 hours
	Project QC Manager	Same Day	Director of Quality Programs	24 hours

[1]Timing - Immediately - Real time verbal discussion or notification in writing
Same Day
24 hours - written event report copy; Client notification, or as specified in contract or project specification

ESS Environmental Safety Specialist
ESC Environmental Safety Coordinator
PESM Project Environmental and Safety Manager
QC Quality Control
VP Vice-President

Investigations that fall within the scope of the OSHA Process Safety Management Standard must meet the requirements of 29 Code of Federal Regulations (CFR) 1910.119(m). Projects that must meet this standard shall include the appropriate reporting requirements in project specific procedures or plans.

Project QC personnel should participate in the QER Cause Analysis and in determining an appropriate Action Plan.

Completed investigation reports should be submitted within 10 working days to:

a. Project Manager or Office Manager for review and signature

b. PESM or Project QC Manager (for QERS) for review and signature

c. ESS (for projects) or ESC (for offices) for review and signature

d. Director, EHS Services/Quality Services as applicable

Electronic submittal within 10 working days meets these reporting requirements. Additional reporting requirements are listed in Table 1.

The Project or Office Manager and the PESM, or Project Quality Manager must sign the report indicating their satisfaction with thoroughness of the investigation and the report and their concurrence that the action items address the identified causes. This constitutes the peer review, and the report, particularly the description, should be clear to readers not familiar with the project or incident.

3.5 External Notifications

3.5.1 OSHA Notification

Notification to OSHA is required within 8 hours if the event resulted in one or more fatalities and/or three or more hospitalized individuals. The 8-hour notification of OSHA is also required if a fatality or hospitalization of three individuals occurs within 30 days after the event.

The Director, EHS Services, has the responsibility for making the OSHA notification. The senior site EHS representative shall make the notification if the Director, EHS Services is unavailable.

The Project Manager is responsible for notifying the client of any required OSHA notifications.

3.5.2 Agency Notifications for Spills, Releases, and Permit Exceedences

It is the Company's policy that *if a spill, release, or permit exceedence is determined to be reportable, the Company or the client shall perform the reporting in a timely fashion as defined by federal, state, or local laws and regulations*. Notifications shall be made per contract requirements or the project Communications Plan. Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures. During the conduct of project activities, the client shall be notified regarding the spill, release, or permit exceedence and the Company's notification determination.

The Project Manager, in conjunction with the PESM must determine whether a spill, release, or permit exceedence exceeds reportable quantities to a regulatory agency under federal, state, and/or local laws and regulations or permit conditions. This determination must be made quickly because many laws and regulations require that notifications be made within short time frames (immediately upon knowledge, but no later than 24 hours).

If a spill or release is determined <u>not</u> to exceed reportable quantities, the PESM shall evaluate whether the spill or release poses a threat to human health (for example, has or may release into known drinking water sources, has or may cause contamination of surface soils/materials/air accessible to the public, and so forth). If a spill or release is determined to pose a threat to human health, the Project Manager, with the assistance of the Director, EHS Services, as necessary, shall consult with the client to determine whether the spill or release should be reported to a regulatory agency.

3.6 Documentation

A copy of each Event Report shall be retrievable for the project or office files. The Event Report database may serve this purpose.

3.6.1 Documentation of Agency and Client Notifications

All agency and client notifications shall be documented on the **<u>Event</u>** Report form. Other documentation generated regarding verbal or written agency notifications (if required), including agency response to such notification, shall either be maintained in the project file or preferably, attached to the Event Report.

In instances where the client conducts the reporting, documentation shall be obtained from the client indicating that the agency was notified in accordance with federal, state, or local regulations and maintained in the project files. If the client verbally notifies the Company that the notification was made, the Project Manager shall document the conversation. In these cases, communications shall be recorded internally in accordance with EHS 1-10, External Regulatory Inspections and Notifications, for Environmental Management System reporting requirements.

If the spill, release, or permit exceedence is determined not to be reportable, the Event Report and Investigation shall include the rationale for not reporting the spill, release, or permit exceedence to a regulatory agency.

3.7 Training

The Director, EHS Services, and the Director, Quality Services, have the responsibility for ensuring that site

and office supervisory personnel have the appropriate training to conduct event investigations.

ESSs shall be trained on a project-specific basis by the PESM to implement the spill/release and permit exceedence reporting requirements in conjunction with training on the requirements of the project-specific EHS Plans per Corporate Reference Library procedure EHS 3-2, Procedures—Environmental, Health & Safety Plan(s).

Personnel serving in a project or office supervision, or office supervision, ESQ position shall have completed and passed the Company provided self-study course entitled "Practical Loss Control Leadership within 3 months of initial assignment."

4.0 GUIDANCE

4.1 Definitions

4.1.1 Event

For the purposes of this program, an event is:

a. An injury or illness that meets the OSHA recordability criteria

b. Ergonomic-related pain complaints

c. An exposure to a hazardous substance above the allowable exposure unit.

d. A property/vehicle/equipment/heavy equipment/truck/passenger damage case that results in damage greater than $500.

e. A fire or explosion.

f. A spill or release resulting from the Company, or subcontractor activities, including spills or releases from operations at a client facility of which Company employees have become aware.

g. Discovery of chemicals or waste products in an office.

h. A permit exceedance.

i. Safety-related events reported by an enforcing authority (ISO 14001 Registrar requirement).

j. Customer, or enforcing authority, complaints regarding the implementation of the Company's EMS or Quality Management System (QMS).

k. External regulatory inspections that result in findings or citations.

l. Quality events as defined in Section 4.1.3.

m. Near-miss occurrences, as defined in Section 4.1.2 below[1]

4.1.2 Near Miss

A "near miss" is an event, that has a reasonable probability in resulting in one of the outcomes described above if the circumstances were different and for which modifications to management programs will reduce the probability of occurrence or the severity of the outcome (see examples of Immediate and Basic causes in Attachment A.

4.1.3 Quality Event

QERs should be generated for the following two situations:

a. When project quality deficiency reports identify a **significant condition adverse to quality**. A significant condition adverse to quality is one that, if uncorrected, could have a serious adverse effect on operability, level of quality, or presents a high loss potential.

b. When an event reveals an opportunity for improved performance through modification of our management system.

4.1.4 Recognition and EMS Communication

ZIP Slips (See PP-10, Employee Recognition Programs) may be used to document employee recognition for a job well done, suggestions for improvement, or minor safety issues that should be resolved.

ZIP Slips may be used to document external inquires or complaints regarding the Company's EMS or project-specific environmental aspects.

4.2 Continuous Improvement

TtEC's event investigation procedure and event report database is a tool used by the (ESQ) organization for continuous improvement by:

Identifying the root causes of each event
Tracking and trending
Selecting appropriate corrective action(s), and person(s) responsible for corrections
Providing Lessons Learned
Identifying additional EHS orientation and training topics
Identifying future health and safety goals and objectives

Corporate ESQ management periodically disseminates valuable information contained in the event/investigation program, company wide to employees in the form of ZIP Bulletins, Flash Reports, and Lessons Learned.

The EMS Coordinator should also review the Event Report database to identify trends and incorporate results into the continuous improvement of the EMS.

4.3 Cause Analysis

4.3.1 Immediate Cause

Determine the immediate causes, using the examples on the form. If one or more of the examples fits the circumstance, use those words in the cause description. Explain, e.g., Improper Lifting – employee attempted to lift box by bending at the waist and twisting while lifting. Be sure that the event description is sufficiently detailed to support the causal analysis in this section. An assumption of cause (e.g., improper lifting) from the injury (low back pain) is not acceptable.

4.3.2 Basic Cause

Like the Immediate Causes, use the guidewords on the form whenever appropriate and explain. For example, improper motivation may be because the correct way takes more time or effort; short cutting standard procedure is tolerated or positively reinforced; or the person thinks there is no personal benefit to always doing the job correctly.

Investigators should determine if a change in the work conditions, scope, methods or personnel contributed to the event. This may occur due to inadequate assessment of hazard potential or inadequate application of

hazard controls. If "Change" was contributing, it will most likely be identified in combination with other basic causes.

Note: The investigator is encouraged to review the Practical Loss Control Leadership chapters on *Causes and Effects of Loss* and *Accident/Event Investigation* before doing the causal analysis. The investigation team should refer to the S.C.A.T. Chart available from the PESM when analyzing causes of high loss potential events, especially where motivation is suspected of being a Basic Cause.

4.3.3 Remedial Actions

Include all actions taken or those that should be taken to *prevent recurrence*. Be sure that actions address the causes. For example, training (safety meetings) may be a necessary response for lack of knowledge, but may be inadequate for improper motivation.

4.4 Loss Control Leadership for Non-Supervisory Personnel

All non-supervisory and non-ESQ positions (excluding craft workers) assigned to conduct field activities should complete the Practical Loss Control Leadership self-study course within one year of initial assignment.

5.0 REFERENCES

Please Describe your Reference Here	Place Your Link in this Column
1. OSHA 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals	
2. EHS 1-10, External Regulatory Inspections and Notifications	
3. EHS 2-1, Emergency Preparedness	
4. EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)	
5. Environmental Management System	
6. HSG 2-7, Risk Prioritization	
7. PP-10, Employee Recognition	
8.	
9.	

6.0_ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Attachment A - Event/Near Miss Report and Investigation	EHS 1-7, Att A, 2007.doc
2. Attachment B - Quality Event Report Form	EHS 1-7, Att B, 2007.doc
3. Attachment C -Event Sketch	EHS 1-7, Att C, 2007.doc

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EHS 1-7 ATTACHMENT B

TETRA TECH EC, INC.

HAZARD REPORT AND SUGGESTION FORM

Hazard Type:
Condition ☐
Practice ☐

The form is intended to provide a means for any employee to report hazards in the work place, or to make suggestions that will improve safety, environmental protection, quality or productivity. It may also be used to report Near Miss incidents with a low loss potential. If desired, the Report may be submitted anonymously. Please provide enough information to allow an effective evaluation of the hazard or suggestion. Your input is appreciated and all suggestions will be evaluated. If your name is included, we may request further information, and will inform you of the disposition. Thank You!

DESCRIBE CONDITION OR PRACTICE:

SUBMITTED BY (OPTIONAL):	**DATE:**

IMMEDIATE CORRECTIVE ACTION COMPLETED:	**COMPLETED BY**	**COMPLETION DATE**

RECOMMENDATIONS FOR FURTHER CORRECTIVE ACTION	**RESPONSIBLE PERSON**	**TARGET DATE**	**COMPLETION DATE**

FOR OFFICE USE ONLY

POTENTIAL INCIDENT TYPE:

Slip/Trip/Fall		**Strain/Overexertion**		**Fire**	
Struck by or against		**Chemical Exposure**		**Environmental Release**	
Caught in, between or under		**Property damage**		**Other (Explain)**	

Project/Office/Location: _____

Report Given To: _____ Date: _____

Tracking Number:

© 1997, 1998 Tetra Tech EC, Inc.

Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Checkboxes can be toggled on ☒ and off ☐ to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

Section 1, General Information

Short Description/Title Below: (limited to 125 characters). This is the description that will appear in the database listing.

Type of Event/Near Miss (check all that apply):

Was a person injured or made ill:

☐ By something at work ☐ By something outside the work environment ☐ No injury or illness

Did this event occur in one of our major offices? ☐ Yes ☐ No List Office:

Did this event occur in a foreign country? ☐ Yes ☐ No

Did this event involve:

A strain?	☐ Yes ☐ No	Fire?	☐ Yes ☐ No
A motor vehicle accident?	☐ Yes ☐ No	Property damage (>$500)?	☐ Yes ☐ No
A repetitive motion injury?	☐ Yes ☐ No	Spill/release?	☐ Yes ☐ No
A fall?	☐ Yes ☐ No	Permit exceedence?	☐ Yes ☐ No
Being struck by something?	☐ Yes ☐ No		

Event Information

Case #:	Site Case #:	Workers Comp #:

Where did the event occur?	Project # (4 digits):
Site/Location Name:	Delivery Order #'s:
Date of event:	Military time:
TtEC Supervisor on duty:	Was Supervisor at event scene? ☐ Yes ☐ No

Event Location:

What employee/employer category was involved in this event?

☐ TtEC permanent
☐ TtEC craft/temp service
☐ Subcontractor
☐ Other

Employer of affected employee?

Weather conditions:	Adequate Lighting at Scene? ☐ Yes ☐ No

What was the employee doing, or what was happening, just before the event occurred? Describe the activity below, as well as the tools, equipment, or material the employee was using. Be specific. For example, "climbing a ladder while carrying roofing materials," "spraying chlorine from hand sprayer," or "daily computer key-entry."

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

What happened? What was the contact or event and how did it occur? Tell us below how the injury occurred. For example, "When the ladder slipped on the wet floor, the worker fell 20 feet," "worker was sprayed with chlorine when gasket broke during replacement," or worker developed soreness in wrist over time." Attach file if necessary.		
Section 2, Affected Employee Information		
Include injured person, driver/operator, or employee whose activities resulted in the event. A new event report must be created for each injured employee.		
Employee's name:	Sex ☐ Male ☐ Female	
Date of Hire:	Job classification:	Number of months at TtEC:
Work hours on shift prior to event:	Years in job classification (##):	
Did event relate to routine task for job classification? ☐ Yes ☐ No		
Section 3, Injury/Illness Information *(If not applicable, check here ☐ and go to Section 4)*		
Nature of injury of illness: Describe body part affected and how it was affected below. Be more specific than "hurt," "pain," or "sore." For example, "strained back."		
What object or substance directly harmed the employee? For example, "concrete floor," "chlorine," "radial arm saw." If this question does not apply to the event, leave it blank.		
Was First Aid provided? ☐ Yes ☐No		
Did the injury/illness result in ☐ Days away (with or without restricted days) ☐ Restricted days only ☐ No or unknown		
Did employee die? ☐ Yes ☐No		
Medical treatment does not include examination, diagnostic tests, or First Aid. See ZIP Bulletin 109 for OSHA definition of First Aid. Attach treatment report/doctor's note or send copies to Director, EHS Services. Was medical treatment provided? ☐ Yes ☐ No		
Section 4, Vehicle and Property Damage Information *(If not applicable, check here ☐ and go to Section 5)*		
Damaged vehicle make:	Damaged vehicle model:	
Damaged vehicle VIN:	Vehicle owner:	
Property damaged:		
Describe property damage:		

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Section 5, Environmental Release ***(If not applicable, check here ☐ and go to Section 6)***		
Environmental Release		
Substance spilled or released:		
From where:	To where:	
Estimated quantity/duration:	CERCLA Hazardous substance? ☐ Yes ☐ No	
RQ exceeded? ☐ Yes ☐ No	Specify RQ:	
Reportable to agency? ☐ Yes ☐ No	Specify (place telecom in project file):	
Responsibility to report: ☐ TtEC ☐ Client ☐ Other	Time frame:	
Written report (place report in project file): ☐ Yes ☐ No		
Response action taken:		
Permit Exceedence		
Type of permit:	Permit #:	
Date of exceedence:	Parameter(s):	
Criteria:	Exceedence levels:	
Exceedence duration:	Reportable to agency: ☐ Yes ☐ No	
Specify (place telecom in project file):	Written report: ☐ Yes ☐ No	
Time frame:		
Response action taken:		
Section 6, Notifications		
Insert names of TtEC personnel notified below:		
Name:	Date:	Time:
Name:	Date:	Time:
Name:	Date:	Time:
Name:	Date:	Time:
Client rep notified:	Date:	Time:
By whom:		
Agency notified:	Date:	Time:
By whom:		
Agency Contact Name:		
Section 7, Persons Preparing Report		
Signature of this form verifies that all supplied information is accurate.		
Employee's name (print):	Sign:	
Employee's name (print):	Sign:	
Supervisor's name (print):	Sign:	
Supervisor's phone number:		
Date:		
Note to supervisor: Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.		

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Section 8, Attach Sketches or Photos		
Report Number:		
Send sketch by mail, fax, or attach an electronic file. EHS 1-7, Attachment C, contains a template that can be used for creating sketches of accidents.		
Vehicle Events		
Write in the street names and, if possible, the points of the compass. Attach black-and-white hard-copy photos or JPG or BMP files (JPG file sizes are typically smaller) as appropriate. If the sketch appears on a police report or insurance form, this need not be completed. Attach the other report or send a hard copy to the Director, EHS Services.		
Section 9, Investigative Report		
Date Information:		
Date of event:	Date of investigative report:	
Event Cost:		
Other event costs: $	WC claim value: $	Estimated loss: $
Cause Analysis		
Was the activity addressed in an AHA? ☐ Yes (attach applicable section) ☐ No		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
☐ Operating equipment without authority	☐ Horseplay	
☐ Failure to warn	☐ Using equipment improperly	
☐ Failure to secure	☐ Failure to follow procedure	
☐ Operating at improper speed	☐ Personnel not properly qualified	
☐ Making safety devices inoperable	☐ Failure to communicate	
☐ Removing safety devices	☐ Operating equipment outside of specified parameters	
☐ Using defective equipment	☐ Failure to check equipment prior to acceptance	
☐ Failure to use PPE properly	☐ Acceptance of defective equipment	
☐ Improper loading	☐ Failure to provide proper equipment	
☐ Improper placement	☐ Improper servicing/maintenance of equipment	
☐ Improper lifting	☐ Other substandard acts	
☐ Improper position for task	☐ Servicing equipment in operation	
☐ Under influence of alcohol/drugs		
Substandard Conditions		
☐ Guards or barriers	☐ Exposure to hazardous materials	
☐ Protective equipment	☐ Extreme temperature exposure	
☐ Tools/equipment or materials	☐ Illumination	
☐ Congestion	☐ Ventilation	
☐ Warning system	☐ Visibility	
☐ Fire and explosion hazards	☐ Radiation	
☐ Poor housekeeping	☐ Hazardous environmental conditions	
☐ Noise exposure	☐ Other substandard conditions	

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Enter brief explanation of each ***immediate cause*** below:

Basic Causes	
What specific personal or job factors contributed to this event? Check all that apply:	
Personal Factors	**Job Factors**
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision
☐ Inadequate mental/psychological capability	☐ Inadequate engineering
☐ Physical or physiological stress	☐ Inadequate purchasing
☐ Lack of knowledge	☐ Inadequate maintenance
☐ Lack of skill	☐ Inadequate tools and equipment
☐ Improper motivation	☐ Inadequate work standards
☐ Other personal factors	☐ Excessive wear and tear
	☐ Abuse and misuse
	☐ Change
	☐ Other job factors
Enter brief explanation of each ***basic cause*** below:	

Section 10, Action Plan	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
☐ Leadership and administration	☐ Health control
☐ Training	☐ System evaluation
☐ Planned inspections	☐ Engineering controls and change management
☐ Task analysis and procedures	☐ Personal communications
☐ Task observation	☐ Group meetings
☐ Emergency preparedness	☐ General promotion
☐ Rules and work permits	☐ Hiring and placement
☐ Accident/event analysis and corrective and preventive action	☐ Materials and services management
☐ Personal protective equipment	

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Remedial Actions			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		

Section 11, Persons Performing Investigation	
Investigator's name:	Date:
Investigator's name:	Date:
Investigator's name:	Date:

Management Review	
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.	
Project/Office Manager Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
ESQ (PESM) Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.	

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment B
Quality Event Report and Investigation

Checkboxes can be toggled on ☒ and off ☐ to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

Section 1, Event Description and Investigation			
Date of event:			
Office/Project Location:		Organization or Department:	
Means of identification:			
☐ Client concern	☐ Nonconformance report	☐ Audit report	☐ Corrective action request
☐ Supervisory review	☐ Peer review	☐ Project review	☐ Other (describe):
Enter Short Description/Title (limited to 125 characters) below. This is the description that will appear in the database listing.			
Issue Summary: Summarize the concern, problem, or situation that needs to be addressed. Identify who was involved and their role (e.g., performer, inspector, auditor).			

Section 2, Persons Preparing Report	
Signature of this form verifies that all supplied information is accurate.	
Employee's name (print):	Sign:
Employee's name (print):	Sign:
Supervisor's name (print):	Sign:
Supervisor's phone number:	
Date:	
Note to supervisor: Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.	

Section 3, Investigative Report		
Date of investigative report:		
Other event costs: $	WC claim value: $	Estimated loss: $
Cause Analysis		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
☐ Operating equipment without authority	☐ Inadequate inspection/peer review	
☐ Failure to follow/improper execution of procedure	☐ Poor judgment	
☐ Using equipment improperly	☐ Failure to communicate—written and/or verbal	
☐ Improper servicing/maintenance of equipment	☐ Acceptance of defective equipment/material	
☐ Under influence of alcohol/drugs	☐ Other substandard acts	
☐ Horseplay		

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment B
Quality Event Report and Investigation

Substandard Conditions	
☐ Personnel not properly qualified or trained	☐ Inadequate oversight
☐ Defective equipment/material	☐ Inadequate procedure/instruction
Enter brief explanation of each ***immediate cause*** below:	

Basic Causes	
What specific personal or job management system factors contributed to this event? Check all that apply:	
Personal Factors	**Job Factors**
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision
☐ Inadequate mental/psychological capability	☐ Inadequate engineering
☐ Physical or physiological stress	☐ Inadequate purchasing
☐ Lack of knowledge	☐ Inadequate maintenance
☐ Lack of skill	☐ Inadequate tools and equipment
☐ Improper motivation	☐ Inadequate work standards
☐ Other personal factors	☐ Excessive wear and tear
	☐ Abuse and misuse
	☐ Change
	☐ Other job factors
Enter brief explanation of each ***basic cause*** below:	

Section 4, Action Plan	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
☐ Leadership and administration	☐ Engineering controls and change management
☐ Training	☐ Personal communications
☐ Planned inspections	☐ Group meetings
☐ Critical task analysis and procedures	☐ General promotion of Loss Control principles
☐ Task observation	☐ Hiring and placement
☐ Rules and work permits	☐ Materials and services management
☐ Accident/event analysis and corrective and preventive action	☐ Quality control
☐ System evaluation	

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Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment B
Quality Event Report and Investigation

Remedial Actions			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		

Section 5, Persons Performing Investigation	
Investigator's name:	Date:
Investigator's name:	Date:
Investigator's name:	Date:

Management Review	
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.	
Project/Office Manager Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
ESQ (PESM, QA) Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:

Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST—AIR QUALITY

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Permitting Applicability/Exemption *(Please complete each line in this section)*				
			1. **State/Local Pre-Construction Permit.** The project modified a point or nonpoint air emissions source for which a permit modification must be obtained from the state/local regulatory agency. (State/regional/local air regulations) *Note: regulated sources may include passive emission sources such as landfills, bioremediation piles, etc.*	
			2. **PSD Permit.** Project modified a major source which has the potential to emit 250 tpy (or 100 tpy if source is one of 28 listed sources) of any regulated air pollutant. Project has potential to emit in "significant amounts" criteria pollutants for which the area is in attainment (NO_x, SO_2, PM_{10}, VOC, CO, lead). Project meets PSD permit conditions (40 CFR 52.21, State/local air regulations)	
			3. **Non-attainment Area.** Project involves the modification of a "major source" which emits a "significant" amount of criteria pollutants for which the area is designated non-attainment. The project obtained permit mod & meets conditions in the pre-construction permit (40 CFR 52, State/local regulations) *Note: definitions for major source and significant amounts of pollutants will vary depending upon the classification of the nonattainment area.*	
			4. **NSPS Sources.** Project involves modification of a source that is subject to NSPS standards. Project obtained permit mod & meets permit conditions. (40 CFR 60)	
			5. **Hazardous Air Pollutant Sources**. Project involves the modification of a source that is listed as a HAP source and has the potential to emit 10 tpy of a single HAP or 25 tpy of a combination of HAPs. Project has obtained proper approval from regulatory agency. (40 CFR 63)	
			6. **Title V Permit.** Project involves the operation of a source which has the potential to emit 100 tpy of any regulated air contaminant, or 10 tpy of a single HAP or 25 tpy of combination of HAPs, or source is subject to NSPS, PSD or nonattainment area permitting. Project complies with permit requirements. (40 CFR 70, State/local air regulations)	
			7. **State Toxic Air Pollutants.** Project involves the modification of a source of toxic air pollutants that is regulated by state/local agency and proper approval has been obtained. (State/local regulations)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			8. Permit Exclusion/Exemption. Project involves modification of a point or nonpoint source that emits regulated air pollutants and the state/local air regulations specifically exempt the project activities from obtaining a permit/approval or an exemption has been obtained. Documentation exists in the project files recording the exemption. (State/local regulations)	
			9. Permit Equivalency. Project is being conducted pursuant to CERCLA. "Substantive" requirements of ARARs, permits/approvals have been documented in project plans/correspondence and project is implementing substantive requirements.	
Equipment/Pollution Control Devices *(Applies if project has equipment that generates or controls air pollution.)*				
			10. Equipment, Process, Materials, Process Rates. Permit terms/conditions reflect current equipment, process, materials, and process rates. If not, note differences and determine if permit modification is required.	
			11. Pollution Control Devices. Air emissions source includes control technology. Evaluation of the following was conducted and determined to be in compliance: a. Verification was made that control technology as specified in permit/regulations is in place and operating properly. b. Inspections of control equipment are being conducted in accordance with permit terms or SOPs. Documentation of inspections is recorded in logbooks/operating record/project files.	
			12. Treatment Residues. Control equipment generates treatment residues which have been properly characterized, managed, and/or disposed of. *Complete applicable waste checklists.*	
Emissions Monitoring and Testing *(Applies if project must conduct air emissions monitoring or testing.)*				
			13. Continuous or Periodic Emissions Measurement. Emissions from project sources are subject to continuous/periodic emissions measurements. Evaluation of the following was conducted and determined to be in compliance: a. Verification was made that emissions measurements comply with regulatory requirements. b. Monitoring data was reviewed and meets emissions limits specified in regulations/permit conditions. c. Recordkeeping to regulatory agency, if required, is being conducted. Documentation exists in project files.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			14. Stack Testing. Project is required to conduct stack testing in accordance with federal, state, or local regulations and/or permit. (40 CFR 51 and 52, State/local regulations) a. Testing was conducted as specified in regulations/permit. b. Notification to regulatory agency, if required, was performed/documented. c. Reporting of testing results was performed, if required. d. Testing verified that source was in compliance with regulatory/permit requirements.	
			15. NSPS Sources. Sources subject to NSPS have specific Continuous Emission Monitoring (CEM) & performance testing requirements. An evaluation of the following was conducted and found to be in compliance: a. Source-specific CEM performance testing specified in applicable Subpart. b. Notification prior to startup of CEM/opacity demonstration was provided to agency. (40 CFR 60.7) c. If excess emissions occurred, quarterly reports were submitted to agency. (40 CFR 60.7) d. CEM requirements in 40 CFR 60.13 are being met. e. General performance testing requirements specified in 40 CFR 60.8 has been met.	
			16. HAPs/NESHAP Sources. Sources subject to HAPs/NESHAPs have specific Continuous Monitoring System (CMS) & performance testing requirements. (40 CFR 61 and 63) An evaluation of the following was conducted and found to be in compliance: a. Source-specific CEM/performance testing specified in applicable Subpart. b. Notification prior to performance test/startup of CEM was provided to agency. (40 CFR 63.7/63.8) c. CMS requirements in 40 CFR 63.8 are being met, including CMS quality control program.	
Emissions Limits *(Please complete each line in this section)*				
			17. General Regulatory Emissions Limits. Emissions for project source comply with all applicable federal, state, local emission limits. This includes point source emissions from units, fugitive emissions from unit and material handling equipment, and toxic air pollutants. (Federal/state/local regulations)	
			18. Permit-specific Emissions Limits. Emissions from project sources comply with permit-specific emissions limits.	
			19. NSPS Source-Specific Emissions Limits. Project is in compliance with NSPS emissions limits. (40 CFR 60, Subparts)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			20. HAPs/NESHAPs Source-Specific Emissions Limits. Project is in compliance with HAPs/NESHAPs emissions limits. (40 CFR 61/63, Subparts)	
Reporting/Recordkeeping *(Please complete each line in this section)*				
			21. Registration. Emissions source is required to register with state/local agency. Project files document that registration has been performed. (State/local air regulations)	
			22. Emissions Inventory. Emissions inventory must be submitted to state/local agency and project files document that emissions inventory has been submitted. (State/local air regulations)	
			23. Permit Posting. Permit is posted conspicuously, if required. (State/ local air regulations)	
			24. Reporting of Startup/Shutdown/Malfunctions/Emissions Excesses/Other. Project files contain documentation that startup/shutdown/malfunctions/excess emission (as applicable) were reported to State/local/EPA. (40 CFR 60, 61, 63, state/local regulations)	
			25. Recordkeeping. All permit/agency required records are maintained in the project files. This may include data from CEM, monitoring, stack tests, maintenance of equipment/pollution control devices, malfunctions, excess emissions, etc. (State/local regulations)	
			26. NSPS Reporting/Recordkeeping. Project is in compliance with the following requirements: a. Documentation exists in project files demonstrating that project has complied with applicable notification requirements. (40 CFR 60.7) b. Records of startup/shutdown, malfunctions of NSPS process, control and monitoring equipment are in project files. (40 CFR 60.7) c. Source-specific recordkeeping requirements have been evaluated and project files contain all proper records. (40 CFR 60 Subparts) d. Reporting to regulatory agencies of source-specific requirements. (40 CFR 60 Subparts)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			27. HAPs/NESHAPs Reporting/Recordkeeping. Project is in compliance with the following requirements: a. Documentation exists in project files demonstrating that project has complied with applicable notification requirements (e.g., performance tests, visible emissions; startup/shutdown/malfunction reports; CMS performance; excess emissions and CMS performance report; summary report for each HAP) (40 CFR 63.7, .9, .10) b. Records of startup/shutdown, malfunctions, control and monitoring equipment are in project files. (40 CFR 63.6(e)) c. Source-specific recordkeeping requirements have been evaluated and project files contain all proper records. (40 CFR 63, Subparts) d. Records of performance tests are maintained for 5 years. e. Startup/shutdown/malfunction plan has been developed & is being properly implemented. Records are kept to demonstrate compliance with plan. If actions are taken that are inconsistent with plan, verbal reporting to agency was performed within 2 days & written report was submitted within 7 days. (40 CFR 63.6(e)(3)) f. Records required in 40 CFR 63.10 are being kept for 5 years.	
CFCs *(This section applies to projects which involve the handling of CFCs.)*				
			28. Export/Import/Production Destruction/Transformation of Ozone-Depleting Controlled Substances. If project involves any of these activities, 40 CFR 82 must be consulted for specific reporting, recordkeeping, labeling, and training requirements.	
			29. Disposal of Appliances/Motor Vehicle Air Conditioners. The disposal of appliances and MVACs are subject to specific disposal prohibitions specified in 40 CFR 82.154. The CFCs from these units must be evacuated by a certified recovery/recycling machine prior to disposal. (40 CFR 82.156) Persons performing testing and equipment used must be certified. (40 CFR 82.158(a) - (d))	
			30. Recordkeeping/Reporting. If appliances/MVACs are disposed of, reporting and recordkeeping requirements are being met. (40 CFR 82.166)	
Miscellaneous *(Please complete each line in this section)*				
			31. Fugitive Dust. Project generates fugitive dust and all reasonable measures (or other local standard) are being used to minimize fugitive emissions. At time of inspection fugitive dust was minimal and measures used to minimize dust were observed (e.g., water tank truck). (State/local regulations)	

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST—AIR QUALITY

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			32. Odor. Odors from project are minimized. (State/local regulations)	
			33. Complaints by Adjacent Landowners. Complaints from adjacent landowners have been filed.	
			34. Inspections by Air Quality Regulatory Agencies. Project has been inspected by air quality regulatory agency. *Please note the purpose (e.g., permit compliance), and results of the inspection.*	
			35. Accidental Release Emergency Planning. State emergency planning requirements are applicable to this project because toxic substances are stored on site that exceed threshold levels. These requirements may include registration, development of risk management plan (RMP), or incorporation of project-related activities into client's facility RMP. *Note: Federal § 112(r) program has not been finalized to date.* (State regulations).	
			36. Open Burning. Project involves opening burning of construction - related debris/materials. Permit has been obtained from State/local air agency, if applicable. Burn - ban criteria have been evaluated and determined to not be applicable. State/local Fire Marshall has been contacted and approval, if required, has been granted. Project is being performed in compliance with any approvals/permits.	

--End of Checklist--

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TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— ASBESTOS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

This checklist applies to projects where asbestos materials or waste are present.

Surveying/Sampling Non-School Buildings		
☐ ☐ ☐	**1. Licensing/Certification/Accreditation**. State/local regulations require that persons/company performing asbestos surveying/sampling in a facility be AHERA-accredited building inspectors if results will be used to determine negative presence of asbestos. (State/local air and safety regulations). Ensure copies of accreditation are present in project file.	
☐ ☐ ☐	**2. Handling/Disposal of Sampling Wastes/PPE**. Sampling wastes/PPE are being handled and disposed of in accordance with state/local requirements. (State/local air and safety regulations)	
Demolition/Renovation (*Applies if facility (or portion thereof) is being demolished or renovated. Demolition and renovation require an asbestos survey to be performed to ascertain presence, quantity, and location of asbestos containing materials.* *Note that some state or local regulatory agencies require prior notice for demolition even if no asbestos was identified in the survey (e.g., Puget Sound Clean Air Agency).*		
☐ ☐ ☐	**3. Written Notification**. Written notification has been provided to EPA/state regulatory agency with a delegated NESHAP asbestos program. Notice is maintained in on-site files. Notice provided based upon type of project. *Note: State/local (e.g., air agencies) regulations may establish different size/time periods for notification so be sure to check local requirements.* a. Demolition/renovation of at least 260 linear ft (160 ft^2) or 35 ft^3 of 1% Regulated Asbestos-Containing Material (RACM) -- 10 day notice provided. b. Demolition of less than 260 linear ft (160 ft^2) or 35 ft^3 of 1% RACM - 10 day notice provided. c. Renovation of less than 260 linear ft (160 ft^2) or 35 ft^3 of 1% RACM - no notice required. d. Revised notice provided if amounts of RACM changed by more than 20% or start date changes. (40 CFR 61.145(b)) e. Asbestos containing roof material, if more than 160 ft^2 is removed. (40 CFR 761, Appendix A provides EPA interpretive ruling)	
☐ ☐ ☐	**4. Removal.** RACM was removed prior to demolition unless it is: a. Category I non-friable Asbestos-Containing Material (ACM) in good condition, b. On facility component which is encased in hard material/adequately wetted, c. Not accessible for testing; not discovered until work began, or d. Category II non-friable ACM unlikely to crumble during demolition. (40 CFR 61.145(c))	

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Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
☐	☐	☐	**5. Non-Component Removal/Emissions Controls.** RACM is adequately wetted unless: a. Agency has indicated that wetting would unavoidably damage equipment/pose safety hazard, b. Exhaust ventilation and collection system designed and operated to capture asbestos emissions is in use and no visible emissions to outside air, c. Glove bag system is being used which is operating to contain particulate asbestos, or d. Leak-tight wrapping is being used to contain all ACM. (40 CFR 61.145(c))	
☐	☐	☐	**6. Component Removal/Emissions Controls**. RACM is stripped with appropriate wetting/exhaust venting or components are placed in leak-tight wrapping. Large components in which ACM is not disturbed and components are placed in leak-tight wrapping/labeled do not need to be stripped. (40 CFR 61.145(c)(4))	
☐	☐	☐	**7. RACM Handling**. No visible emissions to outside air. RACM is carefully lowered to ground without damaging; use leak-tight chutes or containers if removal occurs 50 feet above ground. If temperature is below 0° C, no wetting is required. Temperature records kept for beginning, middle and end of each day and are recorded and retained for 2 years. (40 CFR 61.145(c))	
☐	☐	☐	**8. Training**. Foreman trained in NESHAP regulations is present during shipping, removal, and handling. Verify that proof of training is at project site. OSHA requires annual refresher course. (40 CFR 61.145(c), 29 CFR 1926)	
☐	☐	☐	**9. Posting Area**. Removal/storage area is demarcated and access is restricted. (29 CFR 1929 and 1915; state air regulations)	
☐	☐	☐	**10. Health and Safety Requirements**. OSHA regulations specify requirements that include minimizing exposure, for establishing engineering controls and work practices, monitoring, PPE, medical surveillance, warning/posting/labeling, training/certification of asbestos workers and air monitors, recordkeeping.	
☐	☐	☐	**11. Minimizing Emissions**. All areas of building where RACM is present are being cleaned using HEPA vacuuming, steam-cleaning of carpets/wet-cleaning of floors and horizontal surfaces. (GMP)	
☐	☐	☐	**12. Vehicle Placarding**. All vehicles are marked with visible asbestos hazard warning signs. (40 CFR 61.150 and 61.149)	
☐	☐	☐	**13. Disposal**. Disposal facility has been prequalified under TTEC procedures for disposal of ACM.	
☐	☐	☐	**14. Labeling**. Containers/wrapped materials destined for disposal are labeled with generator name/location/asbestos label as specified in 29 CFR 1910.1001(j)(2) or 1926.58(k)(2)(iii). (40 CFR 61.150(d))	
☐	☐	☐	**15. Shipping papers**. Shipment papers are prepared and signed by generator. (40 CFR 61.150(d))	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
☐ ☐ ☐	**16. Transportation.** Transporter has been pre-qualified under TTEC procedures for transportation subcontractors. Transportation on public roads of asbestos waste complies with 49 CFR 172.101 and 173, Subpart J. *Complete the "Oil and Hazardous Substances Management" checklist.*	
☐ ☐ ☐	**17. Reports**. Exception report has been submitted to EPA/delegated agency if shipment paper was not returned within 45 days. (40 CFR 61.150(d)) Note: May be managed by client. Ensure ESS is aware of who's responsibility it is to file exception reports.	
☐ ☐ ☐	**18. Recordkeeping**. Waste shipment records, exception reports and notifications are retained in project files.. (40 CFR 61.150(d), GMP)	
☐ ☐ ☐	**19. Deconwater/Treatment Filters/PPE.** These waste streams may be regulated RACM. If so, they have been properly handled and disposed of. Review site documentation showing regulated status of these wastestreams.	
☐ ☐ ☐	**20. State Hazardous Waste**. RACM and wastes generated during remedial activity may be a state special/hazardous waste. Review EPP/WMP for any state-specific requirements relating to ACM.	
School Building (*Applies if surveying, sampling, conducting written assessments, developing management plans, and conducting demolition renovation or operation and maintenance in public or non-public schools are performed.)*		
☐ ☐ ☐	**21. Training**. The following persons have been trained in accordance with State or Federal requirements. a. Inspectors that conduct asbestos surveys. (40 CFR 763.85(a)) b. Workers conducting response actions or maintenance activity. c. Contractor/Supervisors conducting response actions/maintenance activities. d. Persons who develop management plans per 40 CFR 763.93. e. Project Designer who designs activities associated with response actions/maintenance activities. f. Project Monitor who oversees abatement activities performed by contractor. (40 CFR 763, Appendix C) Review site training matrix to determine if training requirements are being maintained for all site personnel.	
☐ ☐ ☐	**22. Surveys/Written Assessment**. Surveys should be repeated every 3 years to reassess condition of all friable known or assumed ACM. Review date of most recent survey for project activities related to ACM.	
☐ ☐ ☐	**23. Sampling**. During survey, material suspected of containing asbestos has been sampled in accordance with 40 CFR 763.86. Analysis is being performed by an accredited laboratory. At completion of response actions functional space must be sampled. (40 CFR 763.86, .87, and .90) Review project documentation to ensure samples were collected as determined necessary.	
☐ ☐ ☐	**24. Asbestos Management Plan.** Each facility with ACM has an asbestos management plan. (40 CFR 763.93)	

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Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
☐	☐	☐	**25. Response.** Response action is being conducted in accordance with written assessment developed under 40 CFR 763.88. The response action includes: a. Damaged/significantly damaged thermal system insulation (TSI) ACM which is being repaired or removed. All other TSI ACM and covering is being maintained intact and undamaged. b. Damaged friable surfacing ACM which is either being encapsulated, enclosed, removed or repaired. c. Significantly damaged friable ACM which is being isolated, access is restricted, and ACM is enclosed/encapsulated or removed. (40 CFR 763.90)	
☐	☐	☐	**26. Operations and Maintenance Plan.** An O&M Plan is being implemented if friable surfacing ACM, TSI ACM, and miscellaneous ACM that has potential for damage is found. If those materials have significant damage, O&M plan is being implemented, area is isolated, access is restricted, preventative measures are being instituted, and ACM is being removed, encapsulated, restricted or repaired. (40 CFR 763.91)	
☐	☐	☐	**27. Air Sampling.** Air sampling during and after completion of response action is being conducted in accordance with 40 CFR 763.90. Records of air sampling are being maintained in accordance with 40 CFR 763.94.	
☐	☐	☐	**28. Notification.** Local education agency is providing annual written notification to parents, teachers and employee organization of availability of asbestos management plan. (40 CFR 763.93)	
☐	☐	☐	**29. Minimizing Exposure.** All areas of building where friable ACM is present is cleaned using HEPA vacuuming, steam-cleaning of carpets/wet-cleaning of floors and horizontal surfaces. (40 CFR 763.91(c))	
☐	☐	☐	**30. Record Keeping.** The following records, as applicable, are being maintained in the project files: a. Air sampling information. b. Cleaning records for activities described in 40 CFR 763.91(c). c. Other records, as required by client under contract, training records, description of response actions, surveillance activities, O&M activities, etc.	

-- End of Checklist --

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— CONSERVATION RESOURCES AND ENVIRONMENTAL REVIEWS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Location-Dependent Programs				
			1. **River.** If project site is located adjacent to or within a designed Wild and Scenic River, regulatory agency has been consulted regarding protective measures. Project is in compliance with those measures. Documentation is maintained. (Wild and Scenic Rivers Act, State regulations)	
			2. **Coastal Zone Management Act.** If project site is located within a designated federal/state coastal zone, Coastal Zone Management Act Certification has been obtained and is maintained in files. (CZMA, State/local regulations)	
			3. **Shoreline Protection.** If project site is located within protected shoreline area in the state, a Shoreline Protection Act permit has been obtained. Project is in compliance with permit terms and conditions. (State/local regulations)	
			4. **Public Lands.** If project activities are located or are occurring within federal, state, local public lands, including parks, forests, reserves, and trails, access and use authorization were obtained & documented. (Federal/State/local regulations)	
Environmental Review				
			5. **National Environmental Policy Act.** If applicable, project activities are in compliance with any mitigation measures specified in the final documentation (e.g., FONSI). (40 CFR 1500-1508)	
			6. **State Environmental Policy Act.** Project files contain documentation demonstrating completion of the environmental review and site activities are in compliance with any mitigative measures specified in this document. (State regulation)	
			7. **CERCLA/State Mini-CERCLA Cleanup.** Project is not required to undergo environmental review because it is being conducted under CERCLA or State cleanup law.	
			8. **Exempt.** Project is categorically exempt or has obtained specific exemption that it is not required to undergo environmental review. Project files contain proper documentation. (40 CFR 1500, State regulations)	

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— CONSERVATION RESOURCES AND ENVIRONMENTAL REVIEWS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Location or Activity-Dependent Programs				
			9. Archaeological/Cultural/Historic Resources. Project activities involve excavation or other land disturbing activities. If State Historic Preservation Officer files show that no surveys have been conducted and client has no information about cultural resources at the site, Tetra Tech EC cultural resources specialist or client designated specialist conducted a survey prior to commencing land disturbing activities. (36 800, E.O. 11593)	
			10. Threatened/Endangered Species. If applicable, project files contain notification and regulatory agency response. Project is in compliance with any mitigative measures. If "takings" occur, approval has been obtained. (50 CFR 17, 50 CFR 402.6, state/local regulations)	
			11. Fish and Wildlife Collection. Permit/approval, if required, has been obtained and fish/wildlife collection regulations and guidance are being complied with. (33 CFR 230-330, State/local regulations)	

--End of Checklist--

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— DRINKING WATER, SOLE SOURCE AQUIFER, WELLHEAD PROTECTION AND WATER WITHDRAWAL

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			This checklist applies to projects in which drinking water sources are being constructed/modified/abandoned, groundwater is being withdrawn, or sole source aquifers or wellheads are being impacted.	
			Drinking Water Systems. (*Applies if project involves connection to or upgrading a drinking water system.*)	
			1. **Design.** System design has been approved by regulatory agency and is being constructed in accordance with design plans.	
			2. **PE Certification/Stamping.** If applicable, drawings are properly stamped/certified.	
			3. **Water System Permits.** If required, permit is maintained in files and activities are in compliance with permit terms/conditions.	
			4. **Water System Connection Approvals/Plumbing Code.** If applicable, the connection design has been approved by the local authority and conforms to the local plumbing code.	
			5. **Other Permits/Certifications.** Permits to conduct construction, demolition, and road alteration/interference have been obtained. If fill brought in, certification that fill is clean is maintained in files. *Complete the "Field/Construction/Road Activities" Checklist to demonstrate compliance.*	
			6. **Waste Management.** Construction debris and other wastes, if any, are being properly managed, transported, and disposed of. *Complete applicable waste checklists.*	
			7. **Easements/Right-of-Ways.** Activities are being conducted on property owned/controlled by third parties. Easements and right-of-ways have been obtained prior to conduct of activities and are contained in project files.	
			Well Construction and Abandonment. (*Applies if construction or abandonment of water supply or monitoring wells are performed.*)	
			8. **Well Construction and Abandonment Approval/Notice.** Notice or approval was obtained prior to commencing well construction or abandonment activities. Documentation is in project files. (State regulations)	
			9. **Well Decommissioning Forms.** Notice was submitted to agency after well was decommissioned. (State regulations)	
			10. **Well Construction Standards.** Well construction standards have been met. (State regulations)	
			11. **Well Contractor Licensing.** Contractor performing well construction/abandonment is properly licensed. Documentation of licensing is contained in project files. (State regulations)	

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— DRINKING WATER, SOLE SOURCE AQUIFER, WELLHEAD PROTECTION AND WATER WITHDRAWAL

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Wellhead Protection. (*Applies when project is located near water wells or "well fields" supplying public water.*)				
			12. Wellhead Protection Program. States list wellhead areas that must be protected against contamination or degradation. The state list has been examined to determine if the project areas is listed. (State regulations)	
			13. Wellhead Restrictions. If the impacted area is within a wellhead protection area, all restrictions are being complied with. (State regulations)	
Water Withdrawal. (*Applies if groundwater is being withdrawn.*)				
			14. Groundwater Withdrawal Permit. A withdrawal permit has been obtained if the volume of groundwater being withdrawn exceeds the state-determined level. Terms/conditions of permit are complied with. (State regulations)	
			15. Sole Source Aquifer Protection Standards. Groundwater withdrawal must comply with state/local aquifer protection standards if the underlying aquifer has been designated as a sole source aquifer. (State/local regulations)	
--End of Checklist--				

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			This checklist applies to all projects	
			Program Administration and Documentation	
			1. EHS Procedures. Site has access to current, relevant EHS Program requirements through CRL or other communication source.	
			2. Awareness Recognition Programs (EHS 1-2). EHS awareness being implemented (e.g., postings, posters, etc.). EHS recognition program instituted.	
			3. Employee Participation Program (EHS 1-3). "Major Projects" have EHS Committee, meetings held, and files contain required documentation. The EPP has been implemented and documented (EHS 1-3, Section 3.3).	
			4. Subcontractors (EHS 1-4).	
			a) HIPO Field Contractors have been approved and proper documentation is maintained.	
			b) Waste Management Subs have been approved (including lower tier subcontractors) and proper documentation is maintained.	
			5. Visitor Safety (EHS 1-5). Visitors entering site have complied with procedural requirements.	
			6. EHS Meetings (EHS 1-3)	
			a) EHS Daily Briefings conducted – contents properly documented, EMS issues discussed (ESQ Policy, worker impacts to environment, pollution prevention).	
			b) "Major Projects" conduct weekly meetings. Documentation is maintained.	
			7. Incident/Regulatory Reporting (EHS 1-7)	
			a) Incident reports submitted for all incidents in a timely fashion.	
			b) Investigation report submitted for all incidents in a timely fashion.	
			c) Corrective actions identified in the investigation report have been completed and closure has been documented.	
			d) Employer's first report of injury prepared and submitted on time.	
			e) Permit exceedences/spills/releases have been reported to regulatory agencies as required by law or regulation.	
			8. Manifests/TtEC Permits (EHS 1-8).	
			a) Manifests are not signed by TtEC personnel except as allowed by EHS 1-8.	
			b) No environmental permits in TtEC's name or TtEC as operator except as allowed by EHS 1-8.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			9. Recordkeeping (EHS 1-9). All EHS records maintained per procedure Personnel medical clearance EHS Correspondence H&S Logbooks Weekly Reports Air/noise monitoring records are complete including calibration, monitoring records, chain of custody, laboratory results, and employee notifications as necessary. EHS Compliance Documents EHS Program Documentation (e.g., work permit, fit-test results, etc.)	
			10. External Regulatory Inspections/Notices (EHS 1-10). Have any inspections been conducted by external EHS regulatory agency? If so, when? External EHS Inspection checklist completed, maintained in files, and notifications were made per procedure. Are corrective actions completed?	
			11. EHS/EMS Training (EHS 1-11).	
			a) All staff (including subcontractors) have required EHS and TtEC training. Documentation is maintained on-site as required by EHS 1-11.	
			b) Training on EHS, WM, and DOT Plans have occurred and is documented (EHS 3-2).	
			c) Are personnel trained in the environmental aspects of their activities?	
			12. Ergonomics (EHS 3-1). Field and Office Ergonomic evaluations have been conducted as suggested in EHS 3-1	
			13. EHS Plans (EHS 3-2).	
			a) Meets requirements of EHS 3-2, including requirements under 29 CFR 1910.120 and any other safety or environmental statute or regulation.	
			b) Are TIP/RMP risks incorporated into EHS plan?	
			c) Completed, approved, and signed copy is on-site.	
			d) Has been modified to reflect changing site condition/activities.	
			e) Is being implemented as written.	
			f) Identifies activity hazard analyses, which adequately address site hazards (EHS 3-5).	
			g) Identifies PPE, which is appropriate for site contaminants, actual, and potential exposure levels, and site activities.	
			h) Identifies Air/Noise monitoring strategy (s), which is appropriate for contaminants and activities.	
			i) Lists action levels which are appropriate and action levels are being implemented.	
			j) Identifies exclusion, CRZ, and support zones, site is clearly demarcating these zones per EHS plan (EHS 3-4).	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			k) Discusses appropriate personnel and equipment decontamination procedures. Procedures are being implemented (EHS 5-1).	
			l) Includes Emergency Response Plan, which addresses potential site emergencies (EHS 2-1).	
			m) Addresses Bloodborne Pathogens (EHS 4-1), Hazard Communications (EHS 4-2), Radioactive/Mixed Waste (EHS 4-3), Hearing Conservation (EHS 4-4), and Temperature Extreme (EHS 4-6) requirements as applicable. Requirements are appropriate and properly implemented.	
			n) Addresses respiratory protection program (EHS 5-2) requirements. Program being implemented.	
			o) Addresses environmental conditions and regulatory requirements.	
			p) Identifies all waste streams, management requirements (including client requirements), and transport/disposal plans. These requirements are being implemented.	
			q) Identifies all required environmental permits – permits are current and all applicable conditions are implemented. *(Refer to specific checklists if necessary).*	
			14. Inspections (EHS 3-3).	
			a) Weekly/monthly inspections conducted. Closure of action items are documented.	
			b) Closures of previous PESM inspection action items are documented. (*Those action items not closed must be forwarded to action item matrix for this inspection).*	
Postings/ Signs/ Labeling/ Markings				
			15. OSHA Job Safety & Health Poster.	
			16. OSHA 300 Log (February) posted.	
			17. OSHA Noise Regulation posted.	
			18. Department of Labor Postings.	
			19. Emergency phone numbers posted.	
			20. Other suggested postings: **a)** Evacuation routes posted. **b)** All hazard warning signs. **c)** Noise hazard warning signs. **d)** Control zones clearly identified. **e)** Site perimeter posted and controlled. **f)** Emergency exits clearly marked. **g)** Fire extinguishers clearly marked. **h)** Safety showers/ eyewashes clearly marked. **i)** Circuit breakers labeled. **j)** Low overhead hazards clearly marked.	
			21. Copy of TtEC Work Rules Posted (EHS 3-6).	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			22. ESQ Policy posted.	
			23. TtEC Hotline Poster.	
			24. ZIP/EMS Bulletins are posted, as appropriate.	
Work Practices and EHS Knowledge				
			25. Identify at least 1 Safety Observation performed	
			a) Do Site Personnel: Where appropriate PPE Understand risks Implement appropriate controls Implement permit systems Comply with EHS Plan requirements	
			b) Do Supervisors: Provide appropriate tasking Identify competent persons as necessary Provide sufficient oversight	
			26. EHS personnel have good knowledge regarding use and limitations of the monitoring equipment.	
			27. TtEC (including craft labor) and subcontractor employees are aware of the ESQ policy and commitments it contains.	
High Loss Potential Activities (Meet TtEC and/or Regulatory Requirements)				
			28. Asbestos operations (EHS 8-1).	
			29. Hazardous Materials Management (EHS 3-7).	
			30. Confined space entries (EHS 6-1).	
			31. Drill rigs (EHS 6-2).	
			32. Excavations (EHS 6-3).	
			33. Lockout/ tagout (EHS 6-4).	
			34. Hotwork (EHS 6-5).	
			35. Boating (EHS 6-6).	
			36. Drum Handling (EHS 6-7).	
			37. Adequate fall protection (EHS 3-8).	
			38. Hydroblasting.	
			39. Demolition (EHS 6-8).	
			40. Crane operations.	
			41. UXO Operations.	
Emergency Preparedness				
			42. SCBAs for emergency use inspected each month and documented.	
			43. Sufficient dedicated ER equipment available.	

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			44. Sufficient trained CPR/ first aid personnel available. (See EHS 1-11 for TtEC requirements).	
			45. Site personnel trained to perform ER tasks per EHS Plan.	
			46. ER drills conducted per EHS Plan.	
			47. Emergency response phone numbers verified.	
			48. Local fire department, hazardous materials group, hospital, etc. aware of TtEC expectations for emergency situations	
Environmental Management System				
			49. Project-Specific Significant Environmental Risks (Aspects). Project-specific significant environmental risks (aspects) have been identified in TIP.	
			50. Significant EHS Risks The Project/Site Manager should be able to describe project environmental and H&S risks and their mitigations.	
			a) Pollution Prevention. Does project have a recycling program for paper, bottle, cans, construction debris, trees/shrubs, other: _____ (specify). (Please circle all that apply). *If not, why not?*	
			51. Document Control. No obsolete company guidance documents are maintained on-site. See PO-8 for requirements. Project Staff utilize current company procedures/ have access to CRL.	
			52. Operational Controls. The operations/activities associated with project-specific significant environmental risks (aspects) are carried out in accordance with specifications included in the project work plan, other project plans, and/or applicable procedures. *Operational controls are described as mitigation measures in TIP.*	
			53. Monitoring and Measuring and Corrective Measures. Significant environmental risks (aspects) are being monitored and measured. Corrective action to address deficiencies is implemented and closure is documented in project files.	

-- End of Checklist--

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

CONFIDENTIAL

Project:	**Inspector:**	**Date:**

Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**
			This checklist applies to all projects involved in field construction activities.	
			Utilities (*Applies if project involves the construction, extension, or hookup or shutoff of utilities.*)	
			1. Utilities. Project involves the construction, hook-up or shut-off and extension of the following utilities. *Circle all that apply.* a. Electric b. Phone c. Water d. Sewer e. Gas f. Other:	
			2. Permit/Approval. Permit/approval from local government, state utility siting commission, state agency, or federal base personnel was obtained prior to commencing construction, extension, hook-up, or shut-off activities. Permit/approval is located in the on-site project files or conspicuously posted, if required. (State/local regulations, Base requirements)	
			3. Inspection. Regulatory agency has conducted an inspection of the activities. *In the adjacent column note the date of the inspection(s) and the results.*	
			Zoning/Land Use	
			4. Zoning. Project constitutes an approved use for the zoned area. If not, a conditional use permit or request for re-zoning has been obtained. (State/Local regulations) *Note: This issue normally will apply to larger project in which landfills are being constructed, or other larger facilities are being developed.*	
			5. Building Code. Project involves the construction or placement of temporary or permanent buildings, equipment, or structures. State/local agency or base personnel responsible for reviewing/permitting these structures has been consulted. Permits and/or reviews have been obtained, if necessary. Buildings/structures comply with federal, state, and local building codes. (State/Local regulations) *If an inspection was conducted note the date and results.*	
			6. UFC. Project involves the construction or placement of temporary or permanent buildings, equipment, or structures. State/local agency or base personnel responsible for reviewing fire safety has been consulted. Permits/approvals/reviews have been obtained, if necessary. Buildings/structures comply with federal, state, and local fire codes. (State/local regulations) *If an inspection was conducted note the date and results.*	

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

CONFIDENTIAL

Project:	**Inspector:**	**Date:**

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			7. Airport/FAA Approval. Project involves the construction or placement of temporary or permanent buildings, equipment, or structures which will be constructed adjacent to an airport or exceed 200 feet in height. FAA Certification has been obtained for the project or a determination has been made that the project is exempt. Project files contain the FAA certification or exemption determination (14 CFR 77).	
			8. Noise. Project generates noise emissions (e.g., drilling rigs, construction equipment, etc.). Project is in compliance with state or local noise control standards. If restrictions have been placed on hours of operation, project operating logs demonstrate compliance with these restrictions. (State/Local regulations).	
			9. Certification of Drawings. As-builts, specifications, or drawings have been stamp/sealed by PE or certified by other professional, as applicable, in accordance with state/local regulation.	
			10. Demolition Activities. Project involves the demolition of structures or equipment.	
			a. **Pre-demolition Notice/License.** Notice is maintained in project files or posted conspicuously, if required.	
			b. **Hazardous substances.** A pre-demolition determination regarding the presence of hazardous substances (PCB, Mercury, Lead and Others) associated with building structures, processes and equipment has been made. Proper removal and segregation of these hazardous substances occurs before demolition.	
			c. **Asbestos Determination.** A determination regarding the presence of asbestos has been made. Proper notifications have been made (40 CFR 61, State/Local agencies)	
			d. **Waste Characterization.** Debris and other wastes have been characterized and are being properly managed and disposed of.	
Miscellaneous				
			11. Excavation Activities. Dig-safe/ "hot dig" permits/approvals have been obtained. Permits are maintained in the project files. (State/Local regulations)	
			12. Well Drilling/Construction/Maintenance/Abandonment. Project involves the drilling/abandonment of wells.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			a. **Drilling Permit/Pre-Drill Notification/Start Card.** Permit/approval/notification was obtained in a timely manner and is maintained in the project files. (State/Local regulations).	
			b. **Licensed Operator.** Documentation of Driller or Professional Geologist licensing/certification is maintained in project files. (State/Local regulations)	
			c. **Well Construction/Abandonment Standards.** Well was constructed/abandoned in accordance with regulatory standards/guidance. (State/Local regulations)	
			d. **Post-Abandonment Notification.** Notification was submitted in a timely manner and a copy is maintained in the project files. (State/Local regulations)	
			13. Clean Fill Certification/Testing. Project files contain analytical testing or letter from supplier (which may be the client if from project site) that soil is clean. (State/Local regulations; GMP)	
			14. Soil Erosion Control. Project involves excavation, grading or other land disturbing activities associated with construction projects.	
			a. Stormwater Permit. Project is complying with General or Individual Permit for Stormwater Discharges from Construction Projects as required by State/Local regulations. *Complete "Wastewater/Stormwater Discharge/UIC" checklist*	
			b. Soil Erosion and Sediment Control Plan. Project prepared Plan and effectively implements erosion controls, inspections and maintenance requirements.	
			c. Grading Permit/Plan. Activities are being conducted in compliance with the permit. Permit is maintained in the project files.	
			15. Stormwater Pollution Prevention (SWPP). Project has prepared a SWPP Plan to comply with the Industrial or Construction SWPP requirements (State/Local regulation) to prevent sediment and chemical contamination from migrating off the project site boundary.	
			16. Spill Prevention Control and Countermeasures Plan (SPCC). Projects storing oils in quantities subject to federal regulations (40 CFR 112) have prepared and implemented an SPCC Plan and/or registered tanks (State/Local regulation). *Complete oil and hazardous substances checklist.*	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			17. Dust Control. Project involves land disturbance activity that generates fugitive dust and all reasonable measures (or other local standard) are being used to minimize fugitive emissions. (State/Local regulations)	
			a. Planning. Project has plans, specifications and or procedures for the control of fugitive dust	
			b. Inspections. Project is observing and taking action when visual dust is observed. Responsibility for dust control and visual monitoring is assigned and understood.	
			c. Control Measures. Project has equipment and materials on site to effectively control fugitive dust from land disturbance activities. Controls are implemented in active and inactive (but not fully stabilized) construction areas.	
			d. Effectiveness. At time of inspection fugitive dust was observed to be minimal and controls used to minimize dust were observed (e.g., water tank truck).	
			18. Stream Crossing. If applicable, the USACE § 9 permit has been obtained. State may also require permit. *Complete "Wetlands/Streams/Floodplains" checklist.*	
			19. Land Surveying. Licensed/registered Professional Land Surveyor performed the surveying and stamped/sealed appropriate documentation. (State/local regulations)	
Activities That Impact Roads/Traffic (*Applies if roads or traffic will be impacted by project activities.*)				
			20. Road Alteration/Curb Cuts. Opening/access permit or approval has been obtained from the local or state agency prior to commencing construction. (State/local regulations)	
			21. Heavy/Large Loads. Permit/approval has been obtained from state/local agency authorizing shipment. Time restrictions and weight limits for shipment are being complied with. (State/local transportation regulations)	
			22. Traffic Impact Analysis. If required, the analysis was conducted and approved by the local regulatory agency. (Local regulations)	
			23. Road Crossing/Easements. For public road crossings, right-of-way permit was obtained from state/local agency. For private road crossing, right-of-way permit or easement was obtained from private landowner. Permits/approvals are maintained in the project files. (State/local regulations)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			24. Traffic Control. Flag signals, barricades, safety lighting, warnings, etc., are used for vehicle crossings, loading/unloading, or parking. Sufficient vehicle parking has been allocated. (State/local regulations, Base requirements)	
Materials Transportation *(Includes the activities such as classification, packaging and shipment of DOT-regulated Hazardous Materials. See 49 CFR 172.101 Hazardous Materials Table)*				
			25. Hazardous Materials (HM) Transportation. Project plans identify hazardous materials transported over public roadways by the project and address DOT requirements. *Complete oil/hazardous substances and hazardous waste (as applicable) checklists.*	
			a. **Fuel Transport.** If Project uses "fuel trucks" (i.e., tanks on back of a pickup truck) for diesel fuel transport along roads that are accessible by the public and the tanks have a capacity of > 119 gallons (e.g. DOT definition of "bulk package"), the tanks must be placarded on all 4 sides with a Class 3 Flammable Liquid placard & it must display the appropriate 4-digit DOT Identification Number (49 CFR 172.101).	
			--End of Checklist--	

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PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	**Inspector:**	**Date:**
Yes No N/A	**REQUIREMENTS**	**COMMENTS/NOTES**

This checklist applies when client (or Tetra Tech EC, Inc., if applicable) is storing wastes for longer than 90 days, creating, treating, or disposing of hazardous wastes on-site. Project may include either conducting work at a client's already permitted facility or obtaining a permit. Therefore, reference to the term "facility" throughout this checklist may either include the entire project or the client's facility. However, if the client already has a RCRA permit, the inspection is limited only to those areas of the client's facility which are impacted by the project activities. Other checklists may be required for areas of concern not included under this permit (i.e., Wastewater Discharge, Hazardous Waste: Storage Treatment Disposal in less than 90 days, Air Quality, etc.)

General Requirements *(Please complete each line in this section.)*		
	1. **ESS or Designated Waste Management Role. Discuss Role of ESS or designated individual with regards to waste management at the Site.** a. How is waste management handled. Is it working effectively? b. What types of problems have been encountered? c. Is ESS or designated individual receiving regulatory support/oversight from ESQ Specialists, as needed? d. Does ESS or designated individual have the required training and knowledge? Note – for permitted or interim status facility management, the designated individual should be trained and experienced to a much higher level than is typical on less than 90 day facilities at most Tt project sites.	
	2. **Permit Applications/Interim Status and Final Part B Permits.** Copies of Part A and B permit applications and final Part B permits are located on-site. Verify the following: (40 CFR 270) a. Permit is current. b. Existing physical facilities are consistent with contents in permit and application. c. Part A and B application and permit, as applicable, accurately reflect existing TSD project activities. d. Project is in compliance with applicable permit requirements. Note: Each part of the permit that affects TTEC scope of work must be reviewed and evaluated for compliance as part of this inspection	
	3. **EPA Identification Number.** Facility has an EPA Identification number to store/treat/dispose/transport/offer waste for transport. (40 CFR 264.11 and 265.11)	
	4. **Waste Determination.** Waste has been determined to be hazardous or state-regulated hazardous waste prior to treatment, storage or disposal. (40 CFR 264.13 and 265.13)	
	5. **Waste Analysis Plan.** Written waste analysis plan has been developed.	

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	a. Contents. The waste analysis plan includes: • All wastes generated and received at the project. • Parameters for which each waste will be analyzed. • Test methods used to test for these parameters. • Sampling method used to obtain representative samples. • Frequency with which initial analysis will be reviewed or repeated. • Provisions for retesting waste when the process or operation generating the waste changes. • Procedures used to inspect and analyze each hazardous waste shipment received. (40 CFR 264.13 and 265.13)	
	b. Recordkeeping. Records are kept that confirm waste received matches analyses, waste movement are kept within the facility, and analysis regarding restricted waste are maintained. c. Updates. WAP is updated to reflect requirements applicable to restricted wastes. (40 CFR 265.13(b)(6) and 268.7(c) and (d))	
	6. **Waste Minimization.** Waste minimization practices are being implemented in accordance with a written plan. (40 CFR 262.41(a)(6)-(8); 58 Fed. Reg. 31114)	
	7. **Inspection.** A written schedule has been developed and is being complied with to inspect monitoring equipment, safety equipment, security devices, and operating and structure equipment. a. A copy of the plan is kept at the project site. b. Areas subject to spills are inspected daily. c. Deterioration/malfunctions are remedied in a timely manner. d. All inspections are documented in a log. All inspections must show deficiencies, responsibility for correcting deficiencies, and dates on which those deficiencies were corrected.	
	8. **Location Requirements.** Project involves the construction of a TSD unit. Location standards specified in 40 CFR 264.18 and 265.18 are being complied with.	
	9. **Construction Quality Assurance Program.** For new surface impoundments, waste piles, or landfills (units, lateral expansions, and replacement units constructed after January 29, 1992), a construction quality assurance program was developed and implemented in accordance with 40 CFR 264.19 and 265.19.	
Closure/Post-Closure (*Applies if the project involves closure or post-closure care for any hazardous waste management unit.)*		
	10. **Closure Plan.** Closure is being conducted pursuant to an approved-closure plan. ESS should be able to describe closure requirements and how they are being met. (40 CFR 264.112 and 265.112)	

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	11. Amendment to Plan. Written notice was provided to EPA/state requesting modification to the closure plan and Part B permit because changes in operating plans or facility design affect the closure plan, there is a change in the expected year of closure, or a partial or final closure is being conducted and unexpected events require modification to the approved plan. A copy of the notification should be included in the project files.	
	12. Notification. Notification was provided to EPA/state 60 days prior to conducting closure of a surface impoundment, waste pile, or landfill and at least 45 days prior to closure of a tank, container storage area or incinerator. A copy of the notification should be included in the project files. (40 CFR 264.112 and 265.112)	
	13. Time Allocation. Within 90 days of receiving the last volume of waste, all hazardous wastes are treated, removed from unit or dispose on-site in accordance with the closure plan. The partial/final closure of the unit must be completed within 180 days of receiving the last volume of waste unless an extension has been obtained from EPA/state. Documentation of compliance should be included in the project files. (40 CFR 264.113 and 265.113)	
	14. Disposal. All contaminated equipment, structures and soil are being properly disposed of or decontaminated unless standards specified for closure of individual units are complied with. Hazardous waste generator requirements, as applicable, are being complied with during closure. (40 CFR 264.114 and 265.114)	
	15. Certification. Within 60 days of completion of closure of surface impoundment, waste pile, land treatment, and landfill unit, or completion of final closure of a facility, certification was sent to EPA/state certifying that it was closed in accordance with approved plan. Certification was signed by independent PE and owner/operator of facility. Documentation of compliance should be included within project files. (40 CFR 264.115 and 265.115)	
	16. Survey Plat. Survey plat indicating location and dimensions of landfill cells or other hazardous waste disposal units prepared and certified by professional land surveyor was submitted in timely fashion to local zoning authority and EPA/state. (40 CFR 264.116 and 265.116)	
	17. Post-Closure Care/Plans/Notices and Certifications. Post-closure performance standards, plan requirements, amendment/permit modification requirements, notifications to regulatory agencies and certification of completion are being complied with. (40 CFR 264.117 - .120 and 265.117 - .120)	
	18. State-Specific Requirements. Closure meets state-specific requirements. (State Hazardous Waste Regulations) See Work Plan/WMP for details on requirements.	
Container Storage (*Applies to storage of containers for greater than 90 days.*)		
	19. Marking. Containers are clearly marked with the words "Hazardous Waste".	

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	20. Condition. Containers are in good condition (e.g., no severe rusting, apparent structural defects). (40 CFR 264.171 and 265.171)	
	21. Compatibility. Waste is compatible with container. (40 CFR 264.172 and 265.172)	
	22. Management. Containers are closed at all times, except when adding or removing wastes, and containers are handled/stored in a manner to prevent rupture/leaking. (40 CFR 264.173 and 265.173)	
	23. Stacking Drums. Containers stored on top of each other have pallets between them and are not stored more than 2 high. (GMP)	
	24. Drum Log. A log is kept of all drums contained in the storage area. (GMP)	
	25. Location. Containers holding ignitable/reactive waste are stored at least 50 feet from property boundary. (40 CFR 264.177 and 265.176)	
	26. Secondary Containment--Final Status. Storage area has a secondary containment system which: a. Is impervious: free from cracks or gaps and impervious enough to contain leaks, spills, and precipitation. b. Base is sloped (or otherwise designed) to drain and remove liquids resulting from leaks, spills, or precipitation. c. Containers are elevated or protected from contact with accumulated liquids. d. Has adequate capacity to contain 10% of volume of containers or the volume of the largest container, whichever is greater. e. Run-on into the containment system is prevented or system has sufficient capacity to contain any runon that might enter system. f. Liquids within containment system are removed as soon as practicable. (40 CFR 264.175)	
	27. Inspections. Containers and storage area are inspected at least weekly and logs are kept of these inspections. (40 CFR 264.174 and 265.174)	
	28. Incompatibility. If incompatible wastes are stored in same container, they comply with precautions specified in 40 CFR 264.17(b) or 265.17(b) and if waste is placed in container that previously held incompatible waste, documentation exists that container was washed by drum recycler before reuse. (40 CFR 264.177 and 265.177)	
	29. Separation. Incompatible wastes/materials are separated from each other or protected from each other by dike, berm, wall or other device. (40 CFR 264.177 and 265.177)	
	30. Closure. Upon closure, storage area meets 40 CFR 264.111 or 265.111 decontamination/closure requirements. (40 CFR 264.179 and 265.179)	

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	31. Air Emissions. Containers comply with management standards specified in 40 CFR Part 265.1030, -.1050, and -.1080. a. Subpart AA: Applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air/steam stripping of hazardous wastes with organic concentrations of 10 ppm or greater. Operator must calculate emissions and operate equipment within those specified emissions. b. Subpart BB:Applies to equipment that contains or contacts hazardous waste with organic concentrations of 10 ppm or greater. Refer to subpart for standards for various equipment. c. Subpart CC: Applies to tanks, surface impoundments, and containers used to contain hazardous waste. (ie, hazardous waste is stored in DOT specification containers; hazardous waste tanks meet specific design criteria (note CERCLA and RCRA corrective action exemptions); emissions controls for surface impoundments)	
	32. State-Specific Requirements. Storage area meets state-specific requirements. (State Hazardous Waste Regulations) See WMP for additional state requirements.	
Satellite Accumulation		
	33. Satellite Accumulation Area. A SSA is being used to manage small quantities of hazardous waste being generated at or near the point of generation. If so, complete the applicable SAA section in the *Hazardous Waste: Storage Treatment Disposal in Less than 90 Days* Checklist	
Tanks		
	34. Existing Tanks. If wastes are being stored in existing tanks that do not have secondary containment, there is a written integrity assessment certified by an independent, registered PE that attests to the tank's integrity, within the project files.. (40 CFR 264.191(a) and 265.191(a))	
	35. New Tanks Installed as Part of Project. Project involves the installation of a tank that stores/treats hazardous waste, and the following has been performed: a. **Integrity Assessment.** There is a written assessment reviewed/certified by independent, registered PE of tank's integrity on-site. (40 CFR 264.192(a) and 265.192(a)) b. **Installation Inspection.** There is a written assessment by a qualified installation inspector or registered PE that tank is properly installed on-site. (40 CFR 264.192(b) - (g) and 265.192(b) - (g))	
	36. Marking. Tanks are clearly marked with "Hazardous Waste".	

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	37. Containment System. Applies to a new tank, existing tank storing F020-F023, F026/F027, or other specified existing tanks, unless variance obtained. a. **General Requirement.** Containment system is capable of detecting/collecting releases and accumulated liquids until collected material is removed. (40 CFR 264.193(b)(3) and 265.193(b)(2)) b. **Leak Detection.** Containment system has leak detection system that is designed/operated to detect failure of either primary or secondary containment structure or any release of waste in system within 24 hours, or earliest practicable time. (40 CFR 264.193(c) and 265.193(c)) c. **Removal of Releases.** All spills, leaks, precipitation are removed from containment system within 24 hours. (40 CFR 264.193(c) and 265.193(c)) d. **Specific Design.** Containment is: a liner, vault, double-walled tank or other EPA/state-approved device that meets specified design requirements (e.g., suitable base, sloped, leak detection system). (40 CFR 264.193(d) and (e) and 265.193(d) and (e)) e. ***Ancillary Equipment.*** *Ancillary equipment is provided with secondary containment. (40 CFR 264.193(f) and 265.193(f))* Note: Not applicable to above ground piping/welded flanges, joints, and connections/seamless or magnetic coupling pumps and valves/pressurized aboveground piping with automatic shut-off devices that are visually inspected daily. f. **Existing tanks not yet subject to containment requirement.** If existing tank is being utilized which is not yet subject to containment requirement there is written assessment to leak test tank or tank integrity performed annually by registered PE kept on-site. (40 CFR 264.193(i) and 265.193(i))		
	38. Overfill/Spill Control. Tank system includes spill prevention controls; overfill prevention controls and maintenance of freeboard in uncovered tanks to prevent overtopping. (40 CFR 264.194 and 265.194)		
	39. Inspection. Daily inspections are performed of overfill/spill control; aboveground points of tank; monitoring/leak detection; and tank integrity for signs of ruptures, leaks, corrosion, and surrounding area. Cathode protection systems are inspected bimonthly (and 6 months after installation). Records are kept of inspections. (40 CFR 264.195 and 265.195)		

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	40. Spills/Releases. If a spill has occurred from tank/containment system, the following must be performed: (40 CFR 264.196 and 265.196) a. **Waste/Released Material.** Waste is removed from tank as necessary to prevent further release and released material is removed from containment area within 24-hours/in timely manner. (40 CFR 264.195(a) and (b) and 265.195(a) and (b)) b. **Release to Environment.** A visual inspection/removal of contamination was conducted and Environmental Compliance Spill/Release procedure was implemented. (40 CFR 264.196(c) and 265.196(c)) c. **Notification.** If release to environment occurred, proper verbal and written notification was conducted. (40 CFR 264.196(d) and 265.196(d)) d. **Repair.** If after the release the tank system required major repair, PE certification was sent to EPA/state. (40 CFR 264.198(e) and 265.198(e)) *Note: Major repair includes installation of internal liner, repair of ruptured containment system, etc.*	
	41. Closure. At closure, the standards in 40 CFR 264.197 or 265.197 and Subpart G were met which include removing/decontaminating waste residue, contaminated containment system, contaminated soils, structures, and equipment. (40 CFR 264.197 and 265.197)	
	42. Ignitable/Reactive. If ignitable/reactive waste are stored in tank, 1) waste is treated, rendered, or mixed before placement so that it is no longer ignitable/reactive and meets 40 CFR 265.17(b) **OR** 2) waste is stored/treated so that it is protected from material/conditions that may cause ignition/reaction **OR** 3) tank system is used solely for emergencies **AND** NFPA requirements for storage of such wastes are met. (40 CFR 264.198 and 265.198)	
	43. Incompatible Wastes. Incompatible wastes/materials are not placed in same tank system. (40 CFR 264.199 and 265.199)	
	44. Air Emissions. Storage tanks comply with management standards specified in 40 CFR Part 264 or 265, Subpart AA (air emissions for process vents), BB (emissions standards for equipment leaks), and CC (air emissions for surface impoundments, tanks, and containers, if applicable. (40 CFR 264.178 and 265.178)	

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	45. Waste Analysis and Treatment -- Interim Status. Tank system is used: 1) to treat chemically or to store a hazardous waste that is substantially different from waste previously treated or stored in the tank; or 2) treat chemically a hazardous waste with a substantially different process than any previously used in that tank system. The following is being performed: a. Waste analyses and trial treatment or storage tests (e.g., bench-scale or pilot-plant scale tests); OR b. Written, documented information was obtained on similar waste under similar operating conditions to show that the proposed treatment or storage will meet the requirements of § 265.194(a). (40 CFR 265.200)	
	46. State-Specific Requirements. Tank system meets state-specific requirements (State Hazardous Waste Regulations). See WMP for requirements.	
Containment Buildings		
	47. Enclosed. Building is completely enclosed (floor/walls and roof) and self-supported, and can support the waste and daily operating activities. (40 CFR 264.1100(a) and 265.1100(a))	
	48. Barrier. Building has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel and equipment. Barrier is free of significant cracks, gaps, corrosion or other deterioration that could cause release of waste. (40 CFR 264.1101(a)(4) and (c) and 265.1101(a)(4) and (c))	
	49. Compatibility. Surfaces are chemically compatible with wastes that come into contact with them. (40 CFR 264.1101(a)(2) and 265.1101(a)(2))	
	50. Amount of Waste. Level of waste within containment walls does not exceed height of wall. (40 CFR 264.1101(c) and 265.1101(c))	
	51. Decontamination. Building has decontamination area and procedures to prevent tracking waste out of building. (40 CFR 264.1101(c) and 265.1101(c))	
	52. Fugitive Dust Control. Fugitive dust is controlled so that openings (doors, windows, vents, cracks, etc.) exhibit no visible emissions during normal operating conditions including when vehicles enter and exit unit. If particulate collection devices are used (fabric filter, electrostatic precipitator) these devices are operated and maintained. (40 CFR 264.1101(c) and 265.1101(c))	

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	53. Liquids Management. If containment building is used to store/treat wastes with free liquids, the following requirements are met: (40 CFR 264.1101(b) and 265.1101(b)) a. **Primary Barrier** is designed to prevent the migration of hazardous constituents into the barrier. b. **Liquid Collection/Removal.** Liquid collection system minimizes accumulation of liquids on primary barrier— Primary barrier is sloped to drain liquids to collection system and liquids/waste are collected/removed to minimize hydraulic head on containment system at earliest practicable time. c. **Secondary Containment.** The secondary containment system includes a secondary barrier designed and constructed to prevent migration of hazardous constituents into barrier and leak detection system capable of detecting failure of primary barrier and collecting accumulated wastes/liquids. (*Note: Leak detection system requirement is met if bottom slope is 1% or more and constructed of granular drainage material with hydraulic conductivity of 1 x 10^{-2} or more and 12 inches thick or constructed of synthetic/geonet drainage materials with trasmissivity of 3 x 10^{-5} m^2/sec or more)* d. **Treatment.** If treating in building, treatment area must be designed to prevent release of liquids, wet materials, or liquid aerosols to other portions of building. e. **Chemically Resistant.** Secondary containment system is constructed of materials that are chemically resistant to waste and liquids managed and of sufficient strength and thickness.	
	54. PE Certification. On-site files contain PE certification that containment building is designed in accordance with 40 CFR 264 or 265.1101(a) through (c). (40 CFR 264.1101(c)(2) and 265.1101(c)(2)).	
	55. Release. If condition detected that could cause or has caused a release of waste, the following has been conducted: (40 CFR 264.1101(c)(3) and 265.1101(c)(3)) a. **Repair.** Condition was promptly repaired and any cleanup was conducted. b. **Recordkeeping.** Condition/release was recorded in operating record. c. **Notification.** Within 7 days EPA was notified and within 14 working days written plan of steps taken to repair/cleanup was submitted. d. **PE Certification.** After repairs were performed, EPA was provided with PE certification that repairs/cleanup were conducted in accordance with written plan.	

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	56. Inspection. Building is inspected once every 7 days and results are recorded in project log book/inspection log. (Inspection should include monitoring/leak detection equipment data, containment building, surrounding area for signs of release/deterioration) (40 CFR 264.1101(c)(4) and 265.1101(c)(4))	
	57. Areas With and Without Secondary Containment. If building contains areas with and without secondary containment, each area is designed and operated to meet specified requirements, measures are taken to prevent release of liquids/wet materials into areas without secondary containment, and operating log provides written description of procedures used to maintain integrity of areas without secondary containment. (40 CFR 264.1101(d) and 265.1101(d)).	
	58. Closure. Upon leaving the project site, contaminated containment systems, contaminated sub-soils, and structures/equipment contaminated with waste or leachate are removed or decontaminated. Requirements for closure specified in Subpart G and H are being met. Post-closure care requirements are being met if contaminated sub-soils could not be practically removed or decontaminated. (40 CFR 264.1102 or 265.1102)	
	59. Recordkeeping. The following records are kept: a. Certification by PE that building meets design requirements. b. Operating log which includes containment building operations and reported leaks or spills. c. Regulatory agency correspondence. d. Operating procedures to maintain integrity of areas without secondary containment. (40 CFR 264.1101 and 265.1101)	
	60. State-Specific Requirements. Containment building meets state-specific requirements. (State Hazardous Waste Regulations) See WMP for requirements.	
Surface Impoundments		
	61. Permit. Surface impoundment is operating in accordance with conditions of permit. (40 CFR 270)	
	62. Construction or Expansion. Project involves the construction or replacement of portions of a surface impoundment. The unit is designed and constructed with two or more liners and a leachate collection and removal system between such liners OR an EPA/state-approved alternative design. (40 CFR 264.221(c) and 265.221(a) - e)) *Note: This requirement applies to construction, lateral expansions or replacement of existing units which commenced after January 29, 1992 For interim status units, additional exemptions/variances may apply for replacement units.*	

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	63. Existing Units. Project involves non-construction activities at an existing surface impoundment. The unit : a. Contains a liner which is designed, constructed and installed to prevent the migration of waste out of the unit. *Applies to final status.* (40 CFR 264.221(a)) b. Has 2 feet of freeboard to prevent overtopping of the dike by overfilling, wave action or a storm, unless alternative design is certified by qualified engineer. *Applies to interim status.* (40 CFR 265.221(f) and (g)) c. Designed, constructed, maintained and operated to prevent overtopping by overfilling due to normal or abnormal activities, wind and wave action, rainfall, runon, malfunctions of level controllers, alarms and other equipment and human error. *Applies to final status.* (40 CFR 264.221(g) d. Has a containment system (e.g., earthen dike, covered with grass, rock, or shale) that shows no signs of erosion. (40 CFR 264.221(h) and 265.223) e. Has additional design requirements as specified in the Part B permit. *Applies to final status.* (40 CFR 264.221(i))	
	64. Inspections. The following inspections are conducted. Records are maintained at the project site. a. During and after installation and construction, liners and cover systems are inspected. *Applies to final status only.* b. Freeboard level is checked daily for interim status facilities and weekly for final status facilities. c. Weekly and after storm events, evidence of deterioration, malfunctions, or improper operation of overtopping control systems, sudden drops in the level of the impoundment contents, and severe erosion or other signs of deterioration of dikes and containment devices are checked. d. Leak detection systems are monitored and amount of liquid removed from sump is recorded at least monthly. (40 CFR 264.226 and 265.226)	
	65. Response Action. For new or expansion units, an approved response plan has been developed which describes the actions to be taken if action leakage rate has been exceeded. If flow rate into the leak detection system exceeded the action leakage rate for any sump, EPA was notified in writing within 7 days; a preliminary written assessment was sent to EPA within 14 days; results of determination regarding the location/size/cause of leak, determination whether waste should continue to be received, and long- and short-term actions was submitted to EPA within 30 days after notification. (40 CFR 264.223 and 265.223)	
	66. Certification -- Final Status. Prior to issuance of permit and after extended period, certification was obtained from qualified engineer regarding the integrity of the dike system. (40 CFR 264.226(c))	

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	67. Removal from Service -- Final Status. If level of liquids in impoundment suddenly dropped and cause was not due to flow into or out of impoundment, or the dike leaked, the unit was removed from service in accordance with 40 CFR 264.227(b). Notification to EPA within 7 days was conducted and prior to reinitiating service the steps specified in 40 CFR 264.227(d) were complied with. (40 CFR 264. 227)	
	68. Closure/Post-Closure. Project activities involve closure of a surface impoundment. At closure, all waste residues, contaminated containment system components, contaminated sub-soils, and structures/equipment contaminated with waste and leachate are being removed or decontaminated OR free liquids are being eliminated by removing or solidifying the remaining wastes and residues and covering the surface impoundment. Post-closure care will be conducted if waste residues or contaminated materials are left in place at final closure. Closure plan, cost estimate and financial responsibility requirements specified in Subpart G are also being complied with. (40 CFR 264.228 and 265.228)	
	69. Ignitable/Reactive Wastes. Ignitable/reactive wastes are not placed in the surface impoundment unless: a. Waste and impoundment satisfy 40 CFR 268 requirements; AND b. Waste is treated, rendered or mixed before or immediately after placement in the impoundment so that mixture or dissolution of material no longer meets definition of ignitable or reactive and 40 CFR 264.17(b) or 265.17(b) are complied with; OR c. Waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react; OR d. Surface impoundment is used solely for emergencies. (40 CFR 264.229 and 265.229)	
	70. Incompatible Wastes. Incompatible wastes/materials are not placed in the same surface impoundment unless 40 CFR 264.17(b) or 265.17(b) requirements are met. (40 CFR 264.230 and 265.230)	
	71. Dioxin-containing Wastes -- Final Status. Waste codes F020-F023, F026, and F027 are not placed in a surface impoundment unless the impoundment is operated in accordance with a management plan approved by EPA/state. (40 CFR 264.231)	
	72. Waste Analysis and Trial Tests -- Interim Status. If surface impoundment is being used to chemically treat a hazardous waste which is substantially different from waste previously treated OR chemically treat hazardous waste with a substantially different process than previously used, EITHER waste analyses and trial treatment tests were conducted prior to treatment OR written documented information on similar treatment of similar waste under similar operating conditions to demonstrate compliance with 40 CFR 265.17(b) has been obtained. (40 CFR 265.225)	

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	73. Air Emissions Standards. Air emission standards specified in Subpart CC are being complied with if the surface impoundment is used to manage volatile organic compounds. This requirement applies after June 1996. (40 CFR 264.232 and 265.231)	
	74. State-Specific Requirements. Surface impoundment meets state-specific requirements. (State Hazardous Waste Regulations)	
Waste Piles		
	75. Permit. Waste pile is operating in accordance with conditions of permit. (40 CFR 270)	
	76. Protection From Wind. Pile containing hazardous waste is protected from the wind. Are appropriate BMPs in place? (40 CFR 264.251(j) and 265.251)	
	77. Waste Analysis. Incoming shipments of waste are analyzed prior to adding to the pile to determine compatibility of the waste, unless waste being added is known to be compatible. (40 CFR 264.257 and 265.252)	
	78. Construction or Expansion. Project involves the construction or replacement of portions of a waste pile. Waste pile has: a. Double liner that meets the requirements of 40 CFR 264.251(c); b. Leachate collection and removal system; c. Run-on control system capable of preventing flow onto active portion of pile from at least 25-year storm; d. Run-off system to collect/control water volume from 24-hour, 25-year storm; e. Collection/holding systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity; f. Additional requirements specified in permit. (40 CFR 264.251 and 265.254) *Note: This requirement applies to construction, lateral expansions or replacement of existing units which commenced after January 29, 1992.*	

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	79. Existing Waste Pile. Unless an alternative design has been approved by EPA/state, waste pile has: a. Liner designed, constructed, and installed to prevent migration of wastes out of the pile. *Applies to final status.* (40 CFR 264.251(a)) b. Impermeable base compatible with the waste which supports liner. (40 CFR 264.251 and 265.253(a)(1)) c. Run-on diversion and control systems. (40 CFR 264.251(g) and 265.253(a)) d. Leachate and runoff collection. (40 CFR 264.251 and 265.253) and e. Collection/holding systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity. *Note: Existing pile must be constructed prior to January 29. 1992. If pile is at interim status facility and it is protected from precipitation and runon by other means, and no liquids or waste containing free liquids are placed on pile, then these conditions do not apply.*	
	80. Exemptions -- Final Status. Waste pile is located indoors or otherwise protected from factors which produce leachate and runoff. Pile does not need to comply with the lining, leachate collection and groundwater protection requirements. Verify: a. Liquids are not placed in the waste pile (40 CFR 264.250(c)(1)); b. The unit is protected from surface water runon (40 CFR 264.250(c)(2)); c. Wind dispersal is controlled by a means other than wetting; (40 CFR 264.250(c)(3)); and d. Pile does not generate leachate through decomposition or reactions (40 CFR 264.250(c)(4)).	
	81. Inspections. The following inspections are conducted. Records are maintained at the project site. a. During and after installation and construction, liners and cover systems are inspected. *Applies to final status only.* b. Weekly and after storm events, evidence of deterioration, malfunctions, or improper operation of run-on/run-off systems, proper functioning of wind dispersal control systems and presence of leachate in and proper functioning of leachate collection and removal systems are inspected. *Applies to final status only.* c. Leak detection systems are monitored and amount of liquid removed from sump is recorded at least weekly. (40 CFR 264.254 and 265.260)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	82. Response Action. For new or expansion units, an approved response plan has been developed which describes the actions to be taken if action leakage rate has been exceeded. If flow rate into the leak detection system exceeded the action leakage rate for any sump, EPA was notified in writing within 7 days; a preliminary written assessment was sent to EPA within 14 days; results of determination regarding the location/size/cause of leak, determination whether waste should continue to be received, and long- and short-term actions was submitted to EPA within 30 days after notification. (40 CFR 264.253 and 265.259)	
	83. Closure/Post-Closure. Project activities involve closure of a waste pile. At closure, all waste residues, contaminated containment system components, contaminated subsoils, and structures/equipment contaminated with waste and leachate are being removed or decontaminated. If after removal/decontamination all contaminated subsoils can not be practicably removed/decontaminated, post-closure care will be conducted. Closure plan, cost estimate and financial responsibility requirements specified in Subpart G are also being complied with. (40 CFR 264.258 and 265.258)	
	84. Ignitable/Reactive Wastes. Ignitable/reactive wastes are not placed in a waste pile unless: a. Waste and impoundment satisfy 40 CFR 268 requirements; AND b. Waste is treated, rendered or mixed before or immediately after placement in the impoundment so that mixture or dissolution of material no longer meets definition of ignitable or reactive and 40 CFR 264.17(b) or 265.17(b) are complied with; OR c. Waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react. (40 CFR 264.256 and 265.256)	
	85. Incompatible Wastes. Incompatible wastes/materials are not placed in the same waste pile unless 40 CFR 264.17(b) or 265.17(b) requirements are met. a. Pile that is incompatible with waste/materials stored nearby in containers, other piles, open tanks, or surface impoundments is separated from other materials or protected from them by dike, berm, wall or other device. b. Waste is not piled on same base where incompatible waste/materials were previously piled unless base was decontaminated sufficiently to meet 40 CFR 264.17(b) or 265.17(b) requirements. (40 CFR 264.257 and 265.257)	
	86. Dioxin-Containing Wastes -- Final Status. Waste codes F020-F023, F026, and F027 are not placed in a waste pile unless it is operated in accordance with a management plan approved by EPA/state. Additional design requirements, if any, are being complied with. (40 CFR 264.259)	
	87. State-Specific Requirements. Waste pile complies with state-specific requirements. (State Hazardous Waste Regulations)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

Drip Pads		
	88. Design and Operation. Drip pads are designed and operated as follows: a. Constructed solely of nonearthen materials (40 CFR 264.573(a)(1) and 265.443(a)(1); b. Has an intact curb or berm around the perimeter of the pad and pad is sloped to drain liquids into a collection system (40 CFR 264.573(a)(2) and (3) and 265.443(a)(2) and (3); c. Pad is either covered or capable of preventing runon and runoff from a 24-hour, 25-year storm (40 CFR 264.573(e) and (f) and 265.443(e) and (f)). d. Collecting/holding units are emptied as soon as possible after storms. (40 CFR 264.573(h) and CFR 265.443(h)); e. Pad has hydraulic conductivity of 1 x 10^{-7} cm/sec or less and is free of cracks and gaps, OR synthetic liner is below drip pad, leak detection system is above liner, and leak collection system is installed immediately above the liner. (40 CFR 264.573(a)(4), (b)(1) and (2) and 265.443(a)(4) , (b)(1) and (2)) f. Pad is operated/maintained to minimize tracking of waste/constituents off pad resulting from personnel or equipment activities. (40 CFR 264.573(k) and 265.443(j)) g. After removal from treatment vessel, treated wood is held on pad until drippage has ceased; records are maintained to document. (40 CFR 264.573(k) and 265.443(k))	
	89. Construction of New Units. Project activities involve the construction of a new drip pad. All of the requirements specified in #1 are complied with EXCEPT: a. Pad has hydraulic conductivity of 1 x 10^{-7} cm/sec or less and is free of cracks and gaps, OR synthetic liner is below drip pad, leak detection system is above liner, and leak collection system is installed immediately above the liner. (40 CFR 264.573(a)(4), (b)(1) and (2) and 265.443(a)(4) , (b)(1) and (2)) OR b. Pad has a synthetic liner and leakage detection system constructed in accordance with 40 CFR 264.573(b) or 265.442(b). *Note: New units are those which commenced construction after December 24, 1992.*	
	90. Assessment and Certification. Written independent professional engineering assessments and annual certifications have been conducted and are located in the on-site project files. (40 CFR 264.573(a)(4) and (g), 264.574(a) and 265.441, 265.443(a)(4) and (g))	
	91. Operating Record. Past operating and waste handling practices are document in the facility records. (40 CFR 264.573(o) and 265.443(n).	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	92. Closure. Based upon review of closure plan determine if all wastes will be removed and all contaminated equipment, sub-soils, and structures will be removed or decontaminated OR if the unit will be closed as a landfill. (40 CFR 264.575 and 265.445).	
	93. Inspection. The following inspections have or are being conducted. Documentation is placed in on-site files. a. Liners and cover systems were inspected during and after installation (examine construction records to determine). (40 CFR 264.574(a) and 265.441(a)) b. Drip pads are inspected weekly while in operation and after storm events to detect deterioration, malfunction, or leakage of run-on and runoff control systems, leak detection systems, and the drip pad surface. (40 CFR 264.574(b) and 265.444(b)). c. Drip pads are sufficiently clean to allow weekly inspections. Facility records must note the date and time of cleaning. (40 CFR 264.573(i) and 265.444(i))	
	94. Release. If leak detected, the following has been conducted: (40 CFR 264.573(m) and 265.443(m)) a. **Repair.** Condition was promptly repaired and any cleanup was conducted. b. **Recordkeeping.** Condition/release was recorded in operating record. c. **Notification.** Within 24 hours EPA was notified and within 10 days a written report of steps taken to repair/cleanup was submitted. d. **Certification.** Independent engineering certification was submitted upon completion of repairs and cleanup.	
	95. State-Specific Requirements. Drip pads comply with state-specific requirements. (State Hazardous Waste Regulations)	
Landfills		
	96. Design and Operation. Project involves construction of a new landfill, replacement landfill or lateral expansion of existing landfill that first received waste after November 8, 1984, that meets specific design and construction standards. Landfill constructed after January 29, 1992, that meets minimum technology requirements for a. Double liners; b. Leak detection; and c. Groundwater monitoring. (40 CFR 264.301, 264.90 - 100 and 265.301)	
	97. Written Procedures. Procedures are in place to ensure that received waste is appropriate for landfilling and waste is placed in the proper landfill cell. (40 CFR 270.21)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	98. Runoff Collection/Control System. Landfill has a runoff diversion and control system which is capable of managing a 24-hour, 25-year storm. a. The system is emptied as soon as practicable to maintain the required holding capacity. b. Collected runoff is analyzed to determine if it is hazardous waste. c. Collected runoff is properly managed according to characterization. (40 CFR 264.301(g), (h), and (j) and 265.301(b) - (c)).	
	99. Waste Location Documentation. Operating record contains information on a map designating the exact location and dimensions (including depth of each cell with respect to permanent surveyed bench marks and the contents of each cell) and approximate locations of each hazardous waste type within each cell. (40 CFR 264.73(b)(1) and (2), 264.309 and 265.73(b)(1) and (2) and 265.309)	
	100. Inspection. The following inspections have or are being conducted. Documentation is contained in project files. a. Liners and cover systems were inspected during and after installation (examine construction records to determine). b. Landfill is inspected weekly while in operation and after storm events to detect deterioration, malfunctions, or improper operation of run-on and run-off control systems; proper functioning of wind dispersal control systems, and presence of leachate in and proper functioning of leachate collection and removal systems. c. If landfill is required to have a leak detection system under 40 CFR 264.301(c) or (d) record of the amount of liquids removed from each leak detection system sump must be kept at least once each week during the active life and closure period. After final cover is installed, some exceptions apply if no liquids found in sumps. (40 CFR 264.303 and 265.303)	
	101. Response Action. For new or expansion units, an approved response plan has been developed which describes the actions to be taken if action leakage rate has been exceeded. If flow rate into the leak detection system exceeded the action leakage rate for any sump, EPA was notified in writing within 7 days; a preliminary written assessment was sent to EPA within 14 days; results of determination regarding the location/size/cause of leak, determination whether waste should continue to be received, and long- and short-term actions was submitted to EPA within 30 days after notification. (40 CFR 264.304 and 265.304)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	102. Closure/Post-Closure. Project activities involve closure of a landfill. At final closure, the owner or operator must cover the landfill or cell with a final cover designed and constructed to: provide long-term minimization of migration of liquids through the closed landfill; function with minimum maintenance; promote drainage and minimize erosion or abrasion of the cover; accommodate settling and subsidence so that the cover's integrity is maintained; and have a permeability less than or equal to the permeability of any bottom liner system or natural sub-soils present. After final closure, all post-closure requirements contained in 264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period, are being complied with. If during the post-closure care period, liquid leaks into a leak detection system installed under 264.302, EPA was notified within seven days after detecting the leak. Closure plan, cost estimate and financial responsibility requirements specified in Subpart G are also being complied with. (40 CFR 264.310 and 265.310)	
	103. Reactive/Ignitable Wastes. Reactive or ignitable waste are placed in landfill only if: a. It is treated, rendered, or mixed before or immediate after placement in the landfill so it is no longer reactive/ignitable; OR b. Ignitable waste is in non-leaking containers that are protected from sources of ignition (i.e., daily soil cover, segregation from heat-generating wastes, etc.). (40 CFR 264.17(b), 264.312(a) and (b) and 265.17(b) and 265.312(a) and (b))	
	104. Incompatible Wastes. Incompatible wastes are placed in the same landfill cell only if wastes are managed to prevent: a. Extreme heat, fire or explosion; b. Uncontrolled toxic mists, dusts, fumes, or gases; c. Uncontrolled flammable vapors or gases; d. Damage to structural integrity of landfill; and e. Threat to human health and the environment. (40 CFR 264.17(b) and 265.17(b))	
	105. Bulk Liquids -- Final Status. Bulk liquids are banned from disposal in landfills. Procedure is in place to prevent bulk or non-containerized liquid hazardous or non-hazardous waste or waste containing free liquids from being placed in landfill. Liquids are treated chemically or physically prior to placement in the landfill so that free liquids are no longer present. (40 CFR 264.314(b) and (e), 264.13)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	106. Containerized Liquids. Containerized liquids are only placed in the landfill under the following conditions: a. Free-standing liquid has been removed; b. Waste has been mixed with absorbents or solidified so that free-standing liquid is no longer observed; c. Container is very small, such as an ampule; d. Container is designed to hold free liquids for use other than storage, such as a battery or capacitor; OR e. Container is a lab pack. (40 CFR 264.314(d) and 265.314(d)) f. Absorbents used to treat free liquids are non-biodegradable. (40 CFR 264.314(e) and 265.314(f))	
	107. Empty Containers. Empty containers are reduced in volume (i.e., shredded) prior to disposal in a landfill. Containers meet definition of "empty" prior to disposal. (40 CFR 264.315 and 265.315).	
	108. Dioxin-Containing Wastes – Final Status. Waste codes F020-F023, F026, and F027 are not placed in a landfill unless it is operated in accordance with a management plan approved by EPA/state. Additional design requirements, if any, are being complied with. (40 CFR 264.317)	
	109. State-Specific Requirements. Landfill complies with state-specific requirements. (State Hazardous Waste Regulations)	
Incinerators		
	110. Exemption. Incinerator is exempt from all requirements of this subpart except 40 CFR 264.341 (Waste analysis) and 264.351 (Closure) [40 CFR 265.351 for interim status] because waste meets requirements specified in 40 CFR 264.340(b) and (c) or 265.340(b) and (c).	
	111. Waste Analysis. For final status facility, waste analysis of feed was provided as part of trial burn plan or with Part B application and during normal operation waste feed to incinerator is being analyzed as specified in the permit. For interim status unit, waste which has not been previously burned has been sufficiently analyzed so that steady-state (normal) operating conditions (including waste and auxiliary fuel feed and air flow) and pollutants which might be emitted have been determined. Minimum analysis includes: heat value of waste, halogen, sulfur, lead and mercury content. Waste analysis is placed in operating record. (40 CFR 264.341, 40 CFR 265.341)	
	112. Principal Organic Hazardous Constituents (POHCs) -- Final Status. POHCs in the waste feed are being treated to meet performance standard of 40 CFR 264.343. During trail burn, POHCs are meeting trial burn requirements specified in 40 CFR 270.62. (40 CFR 264.342)	
	113. Performance Standards -- Final Status. Incinerator is designed, constructed, and maintained so that, when operated in accordance with operating requirements specified below in #6, unit meets performance standards specified in 40 CFR 264.343.	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	114. Permit -- Final Status. Incinerator is burning only wastes specified in permit and under operating conditions, unless burning is being conducted under trial burn approved under 40 CFR 270.62 or is subject to exemption specified in 40 CFR 264.340. A permit modification/new permit was obtained to burn other hazardous wastes, if applicable. (40 CFR 264.344)	
	115. Operating Conditions -- Final Status. Incinerator is operating in accordance with operating requirements specified in the permit which include: composition of the waste feed (including acceptable variations in the physical or chemical properties of the waste feed which will not affect compliance with the performance requirement); CO in the stack exhaust gas; waste feed rate; combustion temperature; appropriate indicator of combustion gas velocity; allowable variations in incinerator system design or operating procedures; and other operating requirements as are necessary to ensure that the performance standards are met. These standards apply to start-up and shutdown. Standards specified in 40 CFR 264.345 for controlling fugitive emissions and operation of automatic shutoff/cutoff systems are also being met. (40 CFR 264.345).	
	116. Operating Conditions -- Interim Status. During start-up and shut-down of an incinerator, hazardous waste is not being fed into unit unless the incinerator is at steady state (normal) conditions of operation, including steady state operating temperature and air flow. (40 CFR 265.345)	
	117. Monitoring and Inspections -- Interim Status. During hazardous waste burning, specified instruments are monitored at least every 15 minutes (waste feed gauge, auxiliary fuel feed gauge, CO gauge, air flow gauge, temperature, scrubber flow, scrubber pH gauge, and relevant level controls). Daily inspection is conducted of: a. Pumps, valves, conveyors, and pipes for leaks, spills, and fugitive emissions; b. Emergency shutdown controls; and c. System alarms. Inspections logs are kept in the project files (40 CFR 265.347 and 265.15)	
	118. Monitoring and Inspections -- Final Status. Continuous monitoring of combustion temperature, waste feed rate, and combustion gas velocity is being conducted. Pumps, valves, conveyors, and pipes are monitored daily for leaks, spills or fugitive emissions. Waste feed cut-off and associated alarms are monitored at least weekly. Inspections logs are kept in project files. (40 CFR 264.347)	
	119. Closure. All hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the incinerator site is removed at closure. (40 CFR 364.351 and 265.351)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	120. Dioxin Containing Wastes -- Interim Status. If unit is burning F020, F021, F022, F023, F026, or F027 wastes, a certification has been obtained demonstrating that unit meets the performance standards of 40 CFR 264, Subpart O. (40 CFR 265.352)	
	121. Waste Residues and Treated Wastes. Solid wastes generated from the treatment, storage or disposal of hazardous waste must be properly managed. Verify if any of the following have been generated: ash, scrubber liquids, refractory material, scrubber filters, etc.	
	122. State-Specific Requirements. Incinerator complies with state-specific requirements. (State Hazardous Waste Regulations)	
Thermal Treatment Units. (*This section applies to interim status facilities only.)*		
	123. Operation. Thermal unit is operated at steady-state conditions whenever waste is added to the unit, including startup and shutdown periods. For continuous feed processes, written procedures have been developed to ensure that process is operating at steady-state before adding hazardous waste. (40 CFR 265.373)	
	124. Waste Analysis Plan. A written waste analysis plan has been developed. Waste analysis is performed on hazardous waste not previously burned. Written procedures incorporate the analysis results into operating parameters that establish the steady-state conditions. Waste analysis plan includes: heat value, halogen content, sulfur content, concentration of lead, mercury and PCBs. Lead and mercury analysis are not required if facility has written, documented data that show elements are not present. Waste analysis is documented in the operating record. (40 CFR 265.375)	
	125. Monitoring and Inspections. Instruments related to combustion and emission control are monitored at least every 15 minutes (waste feed gauge, auxiliary fuel feed gauge, treatment process temperature gauge, process flow gauge, afterburner/temperature controls, O_2 and CO meters, process levels, etc.). Stack plume emissions are monitored at least hourly (for color and opacity). Daily inspection is conducted of: a. Pumps, valves, conveyors, and pipes for leaks, spills, and fugitive emissions; b. Emergency shutdown controls; and c. System alarms. Inspections logs are kept in the project files. (40 CFR 265.377 and 265.15)	
	126. Contingency Planning. Written contingency plan has been developed to ensure that corrective actions are initiated when operating conditions based upon combustion and emission control instruments or observation of emission plume change. Procedures are being followed. (40 CFR 265.377)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	127. Detonation of Explosives. Project involves the open burning or detonation of waste explosives and detonation meets distance requirements specified in 40 CFR 265.382. Written procedure is in place to prohibit open burning of hazardous waste (except waste explosives).	
	128. Closure. At closure, all hazardous waste and hazardous waste residues (including, but not limited to, ash) are removed from the thermal treatment process or equipment. (40 CFR 265.381)	
	129. Dioxin Containing Wastes -- Interim Status. If unit is burning F020, F021, F022, F023, F026, or F027 wastes, a certification has been obtained demonstrating that unit meets the performance standards of 40 CFR 264, Subpart O. (40 CFR 265.382)	
	130. Waste Residues and Treated Wastes. Solid wastes generated from the treatment, storage or disposal of hazardous waste must be properly managed. Verify if any of the following have been generated: ash, scrubber liquids, refractory material, scrubber filters, etc.	
	131. State-Specific Requirements. Unit complies with state-specific requirements. (State Hazardous Waste Regulations). Refer to WMP for requirements.	
Chemical, Physical, and Biological Treatments. (*Applies to interim status facilities only.*)		
	132. Operating Procedure. Written procedure is in place that describes the types of wastes that are not permitted to be added to the treatment systems and specifies all operating and safety procedures. Chemical, physical, or biological treatment of hazardous waste complies with 40 CFR 265.17(b). Hazardous wastes or treatment reagents are not placed in the treatment process or equipment if they could cause the treatment process or equipment to rupture, leak, corrode, or otherwise fail before the end of its intended life. Where hazardous waste is continuously fed into a treatment process or equipment, the process or equipment is equipped with a means to stop the inflow (e.g., a waste feed cut-off system or by-pass system to a standby containment device). (40 CFR 265.401)	
	133. Waste Analysis Plan. A written waste analysis plan has been developed. If hazardous waste being treated is substantially different from any hazardous waste previously treated, or if a substantially different process than previously used is being used to chemically treat the waste, waste analysis and treatment tests are being performed OR written, documented information on similar treatments of similar wastes is kept in project files. (40 CFR 265.13, 265.402, 265.17 and 265.401(a))	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	134. Inspections. Daily inspections are being conducted of a. Discharge control and safety equipment; and b. Data gathered from monitoring equipment. Weekly inspections of construction materials used in the treatment process or equipment are conducted to detect signs of corrosion or leakage. Inspection logs are maintained in the project files documenting conduct of these inspections. (40 CFR 265.403, 265.15 and 265.73)	
	135. Incompatible Wastes. Incompatible wastes are placed in the same treatment process only if wastes are managed to prevent: a. Extreme heat, fire or explosion; b. Uncontrolled toxic mists, dusts, fumes, or gases; c. Uncontrolled flammable vapors or gases; d. Damage to structural integrity of landfill; and e. Threat to human health and the environment. (40 CFR 265.17(b)) If waste is placed in a treatment unit that previously held an incompatible waste, procedures are in place to ensure that equipment is properly washed prior to placing incompatible waste in unit. (40 CFR 265.406(b))	
	136. Reactive/Ignitable Wastes. Reactive or ignitable waste are treated to prevent ignition or reaction. a. It is treated, rendered, or mixed before or immediately after placement in the treatment process so it is no longer reactive/ignitable; b. Treated in a manner that does not threaten human health or the environment; OR c. Treated so that it is protected from any material or condition that may cause the waste to ignite or react. (40 CFR 265.17(b), 265.405(a)(1) and (2))	
	137. Closure. At closure, all hazardous waste and hazardous waste residues are removed from treatment processes or equipment, discharge control equipment, and discharge confinement structures. (40 CFR 265.404)	
	138. Waste Residues and Treated Wastes. Residues from hazardous waste treatment process are hazardous waste unless specifically exempt. Verify that treatment residue is managed as hazardous waste or is delisted. (40 CFR 261.3(c) and (d), 260.22 and 265.404)	
	139. State-Specific Requirements. Unit meets state-specific requirements. (State Hazardous Waste Regulations)	
Land Treatment Units		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	140. Design and Operation. Unit is designed and operated in accordance with permit conditions. Land treatment program has been established in accordance with 40 CFR 264.271 that is designed to ensure that hazardous constituents placed in or on the treatment zone are degraded, transformed, or immobilized within the treatment zone. For interim status unit, hazardous waste is not placed in or on a land treatment facility unless the waste can be made less hazardous or nonhazardous by degradation, transformation, or immobilization processes occurring in or on the soil. (40 CFR 264.273(a) and 265.272(a))	
	141. Treatment Demonstration. -- Final Status. Treatment demonstration has been conducted for each waste that will be applied to the treatment zone in accordance with 40 CFR 264.272.	
	142. Waste Analysis -- Interim Status. Before hazardous waste was placed in or on a land treatment facility, waste analysis was conducted in accordance with 40 CFR 265.273.	
	143. Run-on/Runoff Control. Treatment zone is designed, constructed, operated and maintained to minimize runoff of hazardous constituents. Runon control system is capable of preventing flow onto the treatment zone during peak discharges from at least a 25-year storm. Runoff control system is capable of collecting and controlling at least water volume from a 24-hour, 25-year storm. Collection and holding facilities associated with runon/runoff system are managed to maintain the design capacity of the system. (40 CFR 264.273 and 265.272)	
	144. Wind Dispersal Control. Treatment zone contains particulate matter and wind dispersal is being controlled. (40 CFR 264.273(f) and 265.272(e))	
	145. Inspections – Final Status. Treatment unit is inspected weekly and after storms to detect deterioration, malfunctions, or improper operation of the runon/runoff control systems and improper functioning of wind dispersal control measures. Inspection logs are being maintained in the on-site project files. (40 CFR 264.273(g))	
	146. Monitoring. If unit is conducting unsaturated zone monitoring such monitoring is being conducted in accordance with permit conditions or monitoring plan. (40 CFR 264.278 and 265.278)	
	147. Significant Increase of Hazardous Constituents -- Final Status. If a significant increase in hazardous constituents below the treatment zone has occurred, the EPA/state was notified within 7 days and an application for a permit modification was submitted within 90 days of this increase. (40 CFR 264.278(g))	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	148. Reactive/Ignitable Wastes. Reactive or ignitable waste are treated to prevent ignition or reaction. a. It is immediately incorporated into the soil so that they no longer meet the definition of ignitability or reactivity; OR b. It is managed to prevent ignition or reaction. (40 CFR 264.281 and 265.281)	
	149. Incompatible Wastes. Incompatible wastes are treated in separate treatment zones or other adequate precautions are taken to prevent reactions from occurring. (40 CFR 264.282 and 265.282)	
	150. Treatment of Dioxins -- Final Status. Waste codes F020 - F023 or F026 - F027 are treated and facility has a management plan approved by EPA/state for treatment of these wastes. (40 CFR 264. 283)	
	151. Recordkeeping. Hazardous waste application dates and rates are included in the operating record required under 40 CFR 264.73 and 265.73. (40 CFR 264.279 and 265.279)	
	152. Closure. Land treatment unit is being properly closed. a. Operations necessary to maximize degradation, transformation, or immobilization of waste and minimize run-on/runoff and wind dispersal will continue through closure. b. Vegetative cover is being established and maintained. c. Unsaturated zone monitoring is being continued. d. Soil pore monitoring is continued for 90 days after last waste application e. Closure has been certified by independent qualified soil scientist or independent registered professional engineer. (40 CFR 264.280 and 265.280)	
	153. State-Specific Requirements. Land treatment unit complies with state-specific requirements. (State Hazardous Waste Regulations)	
Miscellaneous Units (*Applies to final status units only.*)		
	154. Design and Operation. Unit is designed and operated in accordance with permit conditions, including but not limited to: a. Prevention of migration of waste constituents in groundwater or subsurface environment; b. Prevention of migration of waste constituents in surface water, wetlands, or soil surface; c. Prevention of migration of waste constituents to air; and d. Procedures regarding monitoring and analysis, inspection, emergency response, spill reporting, and corrective action. (40 CFR 264.600 - 603)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	155. **Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action.** Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies have been developed and are being implemented to comply with 40 CFR 264.601, 264.15, 264.33, 264.75, 264.76, 264.77, and 264.101 as well as meet any additional requirements needed to protect human health and the environment as specified in the permit. (40 CFR 264.602)	
	156. **Closure.** Plan is in place for closure and if all contamination cannot be completely removed, post closure plan is in place. (40 CFR 264.603)	
	157. **State-Specific Requirements.** Miscellaneous unit complies with state-specific requirements. (State Hazardous Waste Regulations)	
Boilers And Industrial Furnaces		
	158. **Interim Status.** Project involves the construction or operation of a BIF which is operating under interim status. The unit complies with 40 CFR 266.103 and 266.104 requirements.	
	159. **Final Status.** Project involves the construction or operation of a BIF which is operating under a final status permit. The unit complies with 40 CFR 266.100, 270.22 and 270.66 requirements.	
Groundwater Monitoring		
	160. **Solid Waste Management Unit – Final Status.** Facility has SWMUs that are subject to the groundwater monitoring program. Sampling for each hazardous constituent or monitoring parameters as specified in the permit are being met. Groundwater monitoring plan which was approved by the state/EPA is being implemented. (40 CFR 264.90 - .101)	
	161. **Monitoring At Interim Status Facilities.** Project involves activities at a surface impoundment, landfill, or land treatment facility which is used to manage hazardous waste and is required to implement a groundwater monitoring program. The groundwater monitoring system is designed in accordance with 40 CFR 265.91, sampling and analysis is conducted in accordance with 40 CFR 265.92, groundwater quality assessment program meets 40 CFR 265.93 requirements, and reports/recordkeeping requirements specified in 40 CFR 265.94 are met. *Note: Facility may have obtained a waiver from these requirements if the criteria specified in 40 CFR 265.90(c) - (e) were met.*	
Corrective Action Management Units Facilities (*Applies to final status facilities only.*)		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	162. Designated Area. Area at the facility has been designated as CAMU. The permit or order specifies the areal configuration of the CAMU, requirements for remediation waste management (including design, operation and closure requirements) and requirements for groundwater monitoring. If a regulated unit is designated as a CAMU or a regulated unit is incorporated into a CAMU, Subpart F, G, and H requirements and the unit-specific requirements of part 264 or 265 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU. (40 CFR 264.552)	
	163. Closure. Closure of the CAMU will minimize the need for further maintenance and control to the extent necessary to protect human health and the environment. For areas where wastes remain in place, closure will minimize the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere. Closure may include excavation, removal, treatment or containment of wastes; and removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU. Post-closure requirements are being implemented as necessary to protect human health and the environment, to include, for areas where wastes will remain in place, monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, or other containment system. (40 CFR 264.552(e) and (f))	
	164. Documentation. EPA has documented the rationale for designating the CAMU. (40 CFR 264.552(g))	
	165. Incorporation Into Permit. CAMU has been incorporated into existing permit. Such incorporation has been approved by the EPA according to the procedures for Agency-initiated permit modifications under 40 CFR 270.41 or according to the permit modification procedures of 40 CFR 270.42. (40 CFR 264.552(h))	
	166. Temporary Unit. Temporary tanks and container storage areas are being used for treatment or storage of hazardous remediation wastes. EPA has determined that a design, operating, or closure standard applicable to such units may be replaced by alternative requirements which are protective of human health and the environment. EPA has specified the length of time a temporary unit will be allowed to operate, (which is no longer than one year), and the design, operating, and closure requirements for the unit. The operational period of a temporary unit may be extended once for one year beyond that originally specified in the permit or order and such extension has been approved as agency-initiated permit modification or a Class II modification. (40 CFR 264.552)	

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

Training		
	167. General. Personnel have completed program of classroom or on-the-job training that teaches them to perform their duties. Training has been conducted within 6 months after project start/untrained personnel are supervised. (40 CFR 264.16(a) and (b) and 265.16(a) and (b))	
	168. Annual Refresher. Personnel have undergone annual refresher training. (40 CFR 264.16(c) and 265.16(c))	
	169. Personnel Records. Records are maintained on-site which include: job title of each position at facility and name of person filling it; job description of each position; written description of type/amount of training for each position; and records documenting training. (40 CFR 264.16(d) and 265.16(d))	
	170. Training Records. Training records are kept on-site until project closure. If employee leaves, records are kept for at least 3 years from date of last employment. (40 CFR 264.16(e) and 265.16(e))	
Preparedness and Prevention		
	171. Controlled Entry/Security. The following security measures are installed at the hazardous waste portion of the project site. (40 CFR 264.14 and 265.14) a. Area is surrounded by a fence or natural barrier. b. Entrances are locked or monitored on a 24-hour basis. c. Signs with "Danger-Unauthorized Personnel Keep Out" are posted at each entrance and other locations as appropriate. d. Signs are legible from at least 25 feet and are written in English or other language predominant in the area.	
	172. Management of Project. Project is managed to minimize the possibility of fire, explosion, or any sudden releases to the environment. (40 CFR 264.31 and 265.31)	
	173. Equipment. Project site is equipped with: a. Internal communication or alarm system. b. Telephone or hand-held two-way radio capable of summoning help. c. Spill control, and decontamination equipment, and d. Portable fire extinguisher, fire control equipment, water to supply fire hoses, foam equipment or sprinklers (if flammable wastes on-site). (40 CFR 264.32 and 265.32)	
	174. Testing. Equipment is tested/maintained to assure proper operation and records are kept of testing. (40 CFR 264.33 and 265.33)	
	175. Waste Handling Procedure. Whenever waste is being poured, mixed, spread, or handled, all personnel have immediate access to internal alarm or emergency communication device. When only one employee is on-site, he/she has immediate access to communication device. (40 CFR 264.34 and 265.34)	

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Project:	Inspector:	Date:

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	176. Aisle space. Proper aisle space is maintained to allow unobstructed movement of personnel, fire, spill control, and decon equipment. Three feet is considered GMP. (40 CFR 264.35 and 265.35)	
	177. Local Arrangements. Arrangements have been made with emergency response agencies. (40 CFR 264.37 and 265.37)	
	178. Ignitable/Reactive/Incompatible Wastes. The following is being performed: a. Waste is separated and confined from sources of ignition or reaction, sparks, spontaneous ignition, and radiant heat. b. Smoking and open flames are confined to specifically designated areas. c. "No Smoking" signs are posted in areas where ignitable or reactive wastes are handled. d. Incompatible wastes are always separated. e. Written procedures for avoiding commingling of incompatible wastes have been developed and are being implemented. f. Flammable/ignitable wastes are grounded. (40 CFR 264.17 and 265.17)	
	179. Contingency Planning	
	180. Hazardous Waste Contingency Plan. Facility has a HWCP or SPCC Plan which has been amended to include hazardous waste requirements. The plan includes requirements specified in 40 CFR 264.52 or 265.52. (40 CFR 264.51 and .52, and 265.51 and .52)	
	181. Copies. HWCP is maintained at the project site and submitted to local emergency response agencies, as appropriate. (40 CFR 264.53 and 265.53)	
	182. Revision of HWCP. HWCP is reviewed and amended immediately when: a. Regulations change, b. Plan failed in an emergency, c. Increased potential for emergency from changes in project/facility, d. List of emergency coordinators changes, and e. List of emergency equipment changes.	
	183. Emergency Coordinator Responsibilities. On-site emergency coordinator is familiar with HWCP, operations, location/characteristics of wastes, location of records, facility layout; is on-call or on facility (or has designated alternate); and is authorized to commit resources to implement HWCP. (40 CFR 264.55 and 265.55)	
	184. Implementation of Plan. During emergency, requirements/responsibilities of emergency coordinator, implementation of plan, and notification were properly conducted. (40 CFR 264.56 and 265.56)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

Off-site Transportation/Disposal		
	185. Transporter. Hazardous wastes are offered only to transporters with proper EPA Identification Numbers. (40 CFR 262.12(c))	
	186. Prequalification. Hazardous wastes are transported by and disposed only by prequalified transporters and disposal, treatment, or recycling facilities (EHS 1-4).	
	187. Manifesting. Completed manifests are used each time a regulated hazardous waste is transported off-site. (40 CFR 262.20-.23; 49 CFR 172.604). All required data has been inputted and manifest is properly signed by both the generator and transporter. If TtEC personnel sign the manifest, there is written authorization from the generator and this authorization has been reviewed by ESQ Dept.	
	188. Packaging/Labeling/Placarding. Prior to off-site transport each hazardous waste is: a. Packaged and labeled in accordance with DOT requirements. b. If 110 gallons or less, marked with commercial label designated "Hazardous Waste" and contact information. c. Marked with generator's name, address, and manifest document number. d. Placarded in accordance with DOT requirements. (40 CFR 262.30 - .32)	
Receiving Offsite Waste		
	189. Manifest/Shipping Paper Review. All manifests and shipping papers are reviewed for waste received from offsite sources. Each manifest is signed and dated; discrepancies are noted; transporter is given one copy; copy is returned to generator within 30 days. (40 CFR 264.71 and 265.17)	
	190. Discrepancies. Significant discrepancies are reported on all shipments received: quantity variations greater than 10% for bulk waste; any variation in piece count for batch waste, and obvious differences of waste type. In addition, such discrepancies are reconciled with generator or transporter within 15 days OR if not, letter is sent to EPA. (40 CFR 264.72 and 265.72)	
	191. Unmanifested Waste Reports. If a facility accepts for treatment, storage, or disposal waste from off-site source without an accompanying manifest (and waste is not excluded from the manifest requirement), "Unmanifested Waste Report" (EPA from 8700-13B) was submitted to EPA within fifteen days after receiving the waste.	

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Project:	Inspector:	Date:

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	192. Restricted Waste Disposal. If a facility accepts for treatment, storage, or disposal waste from off-site source which is restricted from land disposal, records are maintained of all notices and certifications pertaining to land disposal. (40 CFR 268.7(c)(1)) a. **Recordkeeping.** Records are maintained of all notices and certifications pertaining to land disposal. (40 CFR 268.7(c)(1)) b. **Sampling and Analysis.** Waste or extract of waste must be tested to ensure waste is in compliance with treatment standards. Verify: • Waste analysis plan contains frequency and analytical methods. • Operating record demonstrates waste analysis plan is being implemented. • Laboratory analysis demonstrates waste disposed of meets LDRs.	
	193. Receiving Off-site Waste. If the project activities include receiving hazardous waste from a foreign source, a notice was filed with EPA at least 4 weeks prior to waste arrival. If project is receiving hazardous waste from off-site source, the facility owner informed generator in writing that facility has appropriate permits and will accept waste that is being shipped. (40 CFR 264.12 and 265.12) a. Written notice is maintained in project's operating record. b. Project is approved to handle specified waste type.	
Import/Export		
	194. Export. Hazardous wastes are being exported outside the U.S. for treatment, storage or disposal. Notification of intended export was sent to EPA, EPA's acknowledged consent was sent to receiving country, and manifesting and reporting requirements are being met. (40 CFR 262.50 - .57)	
	195. Import. Hazardous wastes are being imported to the facility for treatment, storage or disposal from a foreign country. Manifests have been properly completed for these wastes. (40 CFR 262.60)	
Onsite Transportation		
	196. Management Practices. Onsite transportation of hazardous wastes between buildings is accomplished using good management practices to ensure against spills, releases, and accidents. Procedures exist to manage movement of hazardous wastes throughout the site, drivers are trained in spill response, provisions are made to secure waste in vehicles, and site contingency plan covers accidents during transport.	
	197. Crossing Public Roads. Onsite transportation of hazardous wastes involves crossing public roads. If so, offsite transportation requirements must be complied with and facility must be permitted as a transporter. (40 CFR 263)	

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

Recordkeeping. *Note: These are generator requirements; Tetra Tech EC normally is not a generator, but assists clients in managing their wastes. However, Tetra Tech EC may keep some or all of these records depending upon contractual requirements. It is GMP to keep records if Tetra Tech EC is involved in off-site transport or disposal.*

	198. Operating Record. Operating record contains the following: a. Description, quantity and date of placement of each shipment of waste received. This information should cross-reference the manifest number. b. Location of waste at the facility. c. Records and results of waste analysis and trial tests. d. Report on incidents. e. Records/results of inspections in accordance with 40 CFR 264.17 and 265.17. f. Monitoring, testing, and analytical data. g. Copies of LDR notices and certifications. h. Records of quantities of waste placed in land disposal under extension of effective date of any LDR. i. Closure and, for disposal facilities, post-closure plans and cost estimates. Verify closure plan and post-closure plans are up-to-date, reflects all units currently operating, was amended if operating, design or closure plans have changed, and notices sent to EPA to amend plans, if applicable. j. Annual waste minimization program certifications. (40 CFR 264.73, 265.74, 268.7 and 268.8)	
	199. Generator Records If Waste Shipped Off-site. Records are kept on-site for at least 3 years (or in project files if project ends earlier) of the following: a. Copy of signed manifests from TSDF which received waste. b. Copy of exception reports. c. Records to characterize wastes. (40 CFR 262.40)	
	200. Biennial/State Report. Biennial Report has been prepared and submitted by March 1 of each even numbered year or according to timing and schedule of state requirement. Copy of report is kept for 3 years. (40 CFR 264.75, 265.75 and 262.41)	
	201. Facility Reports. The following reports, if applicable, have been prepared, signed, and submitted: a. Any release from solid waste management unit. b. Fires and explosions. c. Groundwater detection monitoring program. d. Compliance monitoring program. e. Corrective action program. f. Surface impoundment, waste pile, land treatment, and land disposal unit monitoring. g. Certification of closure for hazardous waste surface impoundment, waste pile, land treatment, and landfill units. (40 CFR 264.77 and 265.77)	

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Project:	Inspector:	Date:

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	202. Exception Reports. If copy of signed manifest from TSDF was not received within 35 days from off-site transport, transporter was contacted. If the manifest was not received within 45 days, exception report was filed with EPA (state). (40 CFR 262.43)	
	203. LDR Certification/Notices/Waste Analysis. Copies of all data to support characterization either based upon knowledge of waste or testing, notices, certifications, and demonstrations are kept on-site/in project files for at least 5 years. (40 CFR 268.7(a)(5))	
Land Disposal Restrictions		
	204. Notice/Certification. Initial Off-site shipment of waste has generator notice and certification that waste meets/does not meet LDRs (waste number, treatment standard under 40 CFR 268, five letter treatment code, if applicable, manifest number, and waste analysis data. (40 CFR 268.7(a) and (b))	
	205. Variance/Extension/Exemption. If hazardous waste is subject to exemption, variance, or extension from LDR requirements, notice is submitted to TSDF that waste is not prohibited from land disposal. (40 CFR 268.7(a)(3)	
	206. Exemption. If waste is determined to be exempt from RCRA subtitle C subsequent to the point of generation, a one-time notice stating this determination is placed in the project files. (40 CFR 268.7(a)(6))	
	207. Compliance with LDRs. Disposal of hazardous wastes meet treatment standards specified in 40 CFR 268.40 and applicable Universal Treatment Standards in 40 CFR 268.48, unless variance, exemption, or extension has been granted. (40 CFR 268)	
	208. Debris. Debris which contains a listed waste or is characteristically hazardous has: a. Obtained a contained-in determination by EPA under 40 CFR 261 b. Has been treated and meets the performance standards specified in 40 CFR 268.45 and is therefore no physical or chemical extraction longer regulated as hazardous. c. Meets the land disposal restrictions in 40 CFR 268.40 and applicable Universal Treatment Standards of 40 CFR 268.48. d. Residues from treatment of hazardous debris must be managed as a hazardous waste and meet 40 CFR 268 standards prior to land disposal.	

--End Checklist--

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST - HAZARDOUS WASTE: STORAGE/TREATMENT/DISPOSAL IN LESS THAN 90 DAYS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES

This checklist applies when client (or Tetra Tech EC, Inc., if applicable) qualifies as a large quantity generator. A large quantity generator is defined in the federal regulations as any one who generates 1) greater than 1,000 kg per month; 2) 1 kg of an acutely hazardous waste; or 3) 100 kg/month of soil or other material contaminated with an acutely hazardous waste. State regulations should be consulted for state-specific definitions.

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			General Requirements	
			1. **ESS or Designated Waste Management Role.** Discuss Role of ESS or designated individual with regards to waste management at the site. a. How is waste management handled & is it working effectively? b. What types of problems have been encountered? c. Is ESS or designated individual receiving regulatory support from ESQ Env. Compliance/Regulatory Specialists as needed? d. Does ESS or designated individual have the required training and knowledge?	
			2. **Waste Classification.** Waste is characterized as hazardous or state-regulated hazardous waste. Waste containers that are stored pending sample results are labeled as "Hazardous Waste-Pending Analysis," are dated with an accumulation start date (ASD), and are in compliance with 90-day accumulation period while awaiting waste classification.	
			3. **EPA Identification Number.** Generator has obtained EPA Identification number to store & offer waste for transport. (40 CFR 262.12)	
			Container Storage	
			4. **Storage Requirements.** Review weekly inspection forms for container & storage area requirements and inventory/tracking. Perform field observations to document how the requirements are being met and check condition of containers, including marking and labeling requirements. (40 CFR 262.34 and 40 CFR 265.171-177)	
			5. **Inspections.** Containers & storage area are inspected at least weekly & written records are kept of these inspections as well as corrective actions documentation. (40 CFR 265.174; GMP)	
			6. **Incompatibility.** Check to see if incompatible wastes are stored without adequate separation or berms, as applicable. (40 CFR 265.177; GMP)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			7. Air Emissions. Containers comply with management standards specified in 40 CFR Part 265.1030, -.1050, and -.1080 ***(Contact ESQ Env. Compliance Specialist for assistance).*** **a.** If there are process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air/steam stripping of hazardous wastes with organic concentrations of 10 ppm or greater, the operator must calculate emissions & operate equipment within those specified emissions (40 CFR 265 Subpart AA). **b.** If there is equipment that contains or contacts hazardous waste having organic concentrations of 10 ppm or greater, the Subpart BB standards are followed for various equipment. (40 CFR 265 Subpart BB). **c.** If there are tanks that contain hazardous waste, the tanks must meet specific design criteria in Subpart CC *(Note: Superfund sites & RCRA Corrective Actions are exempt*). If haz. waste is stored in surface impoundments, there must be emissions controls per Subpart CC. (40 CFR 265 Subpart CC).	
			8. State-Specific Requirements. Storage area meets state-specific requirements, which may include secondary containment. ***See the Site Health & Safety Plan (or Project Waste Management Plan) for additional requirements.***	
Satellite Accumulation				
			9. Designated Area and Marking. A designated area has been established to accumulate waste (posted as such) & area is marked with caution signage or tape on the floor.	
			10. Quantity and Location. A total of less than 55 gallons of haz. waste (or 1 quart of acutely haz. waste) is being accumulated at the location where the waste is generated and is within control of the person generating the waste. (40 CFR 262.34(c)) Ex.: NAPL removed from a monitoring well is accumulated in a 55-gal. drum & stored next to the well, and drum contains less than 55 gallons. Ex.: Five gallon pails of spent solvent haz. waste are stored in a flammable cabinet in the lab where waste was generated, and the total stored is less than 55 gallons.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			11. Marking. Containers are marked with the words "Hazardous Waste". NOTE: An **Accumulation Start Date** is **not** placed on the container until the total of haz. waste accumulated is equal to or more than 55 gallons of haz. waste (or 1 qt. of acutely haz. waste).	
			12. Timing. Waste is dated when a total of 55 gallons of haz. waste (1 qt of acutely haz. waste) is generated and moved to a less-than-90 days or RCRA permitted storage area within 3 days. NOTE: If site does not have either a Less-Than-90-Days Storage Area or a RCRA Permitted haz. waste storage area, then the haz. waste must be **shipped off-site** within 3 days.	
			13. State-Specific Requirements. Satellite accumulation area meets state-specific requirements. **See Site H&S Plan** (or Waste Mgmt. Plan) for additional requirements.	
			14. Container Management. Containers meet the same condition, compatibility, and requirements for handling as less than 90-day storage areas ***(see #4 through #8 above).***	

REMEDIATION WASTE STOCKPILES (NOTE: This is not the same as a "waste pile" which is a permitted temporary waste storage area similar to a surface impoundment – these are covered in the checklist for hazardous waste permitted Facilities.)

Not all remediation waste will be hazardous waste but RCRA has specific allowances for stockpiling of remediation waste that is hazardous *in situ* (versus in a container, tank, drip pad, containment building) without triggering LDRs or minimum technology requirements (MTRs) if the waste is managed in accordance with the Area of Contamination (AOC) policy. Remediation wastes are generated during state or federal cleanup actions (e.g., CERCLA or state CERCLA programs). Remediation waste may be debris or soil.

Note: Stockpiles of contaminated remediation waste (hazardous or not) on projects sites requires diligence and attention to BMPs because wind and rain create challenges for maintaining stockpile integrity and the spread of contamination can occur. Also, not all remediation sites have space for stockpiling within the AOC, so if direct dig and haul options exist; usually clients prefer that option.

			15. Is the remediation waste stockpile located within the AOC (contiguous contaminated area)?	
			16. Stockpiles of haz. waste are tracked in a waste log to include at a minimum: **a.** Date of generation (accumulation start date) **b.** Dates sampled (if applicable) **c.** Characterization of waste **d.** Off-site shipment dates.	
			17. Stockpiles of hazardous waste are shipped off-site within 90 days of the accumulation start date.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			18. Stockpiles are designed & maintained appropriately (e.g. placed on poly sheeting, bermed, and **covered when not in use or at the end of each day. Covers should be anchored appropriately to avoid wind lifting cover & exposing waste or rain to enter into the bermed area.**	
			19. Stockpiles are inspected at least weekly and inspections are documented. BMP – even non hazardous waste stockpiles should be inspected weekly – e.g., EHS 3-3 weekly inspection checklist.	
Hazardous Waste Tanks (NOTE: DOES NOT APPLY TO TANKS THAT ARE PART OF A "PROCESS" (e.g., Wastewater Treatment collection/treatment tanks for treatment of contaminated groundwater)				
			20. New Tanks Installed as Part of Project. Project involves the installation of a tank that stores/treats hazardous waste, and the following has been performed:	
			a. Integrity Assessment. There is a written assessment reviewed/certified by an independent, registered PE of tank's integrity & document is kept on-site. (40 CFR 265.192(a))	
			b. Installation Inspection. There is a written assessment by qualified installation inspector or registered PE that tank is properly installed & document is kept on-site. (40 CFR 265.192(b) - (g))	
			21. Marking. Tanks are clearly marked with the words "Hazardous Waste" and accumulation start date is clearly visible. (40 CFR 262.34(a))	
			22. Accumulation Time. Waste is stored in tanks for 90 days or less, unless an extension has been obtained from the State (or EPA, if state is not authorized to implement RCRA haz. waste program). (40 CFR 262.34(b))	
			23. Containment System. Applies to a new tank, existing tank storing F020-F023, F026/F027, or other specified existing tanks, unless a variance was obtained.	
			a. **General Requirement.** Containment system is capable of detecting/collecting releases & accumulated liquids until collected material is removed. (40 CFR 265.193(b)(2))	
			b. **Leak Detection.** Containment system has leak detection system that is designed/operated to detect failure of either primary or secondary containment structure or any release of waste in system within 24 hours, or earliest practicable time. (40 CFR 265.193(c))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			c. **Removal of Releases.** All spills, leaks, precipitation are removed from containment system within 24 hours. (40 CFR 265.193(c))	
			d. **Specific Design.** Containment is: a liner, vault, double-walled tank or other EPA/state-approved device that meets specified design requirements (e.g., suitable base, sloped, leak detection system). (40 CFR 265.193(d) and (e))	
			e. **Ancillary Equipment.** Ancillary equipment is provided with secondary containment. (40 CFR 265.193(f)) Note: Not applicable to above ground piping/welded flanges, joints & connections/seamless or magnetic coupling pumps and valves/pressurized aboveground piping with automatic shut-off devices that are visually inspected daily.	
			f. **Existing Tanks not yet Subject to Containment Requirement.** If existing tank is being utilized which is not yet subject to containment requirement, there is written assessment to leak test tank or tank integrity performed annually by registered PE & document is kept on-site. (40 CFR 265.193(i))	
			24. Overfill/Spill Control. Tank system includes spill prevention controls, overfill prevention controls and maintenance of freeboard in uncovered tanks to prevent overtopping. (40 CFR 265.194)	
			25. Inspection. Daily inspections are performed of overfill/spill control; aboveground points of tank; monitoring/leak detection; and surrounding area. Cathodic protection systems are inspected bimonthly (and 6 months after installation). Records are kept of inspections. (40 CFR 265.195)	
			26. Spills/Releases. If a spill has occurred from tank/containment system, the following must have been performed: (40 CFR 265.196)	
			a. **Waste/Released Material.** Waste was removed from tank as necessary to prevent further release and released material removed from containment area within 24-hours/in timely manner. (40 CFR 265.195(a)(b))	
			b. **Release to Environment.** A visual inspection/removal of contamination was conducted and the site-specific Environmental Compliance Spill/Release procedure was implemented. (40 CFR 265.196(c); GMP)	
			c. **Notification.** If release to environment occurred, proper verbal and written notification to the State agency or agencies, and EPA were conducted. (40 CFR 265.196(d))	

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Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			d. **Repair.** If after the release the tank system required major repair, the PE certification was sent to EPA/state. (40 CFR 265.198(e)) Note: "Major repair" includes installation of internal liner, repair of ruptured containment system, etc.	
			27. Closure. At closure, the standards in 40 CFR 265.197 and Subpart G were met which include removing/decontaminating waste residue, contaminated containment system, contaminated soils, structures, and equipment. (40 CFR 265.197) ***(Contact ESQ Env. Compliance Specialist for assistance).***	
			28. Ignitable/Reactive. If ignitable/reactive wastes are stored in tank, 1) waste is treated, rendered, or mixed before placement so that it is no longer ignitable/reactive and meets 40 CFR 265.17(b) **OR** 2) waste is stored/treated so that it is protected from material/conditions that may cause ignition/reaction **OR** 3) tank system is used solely for emergencies **AND** NFPA requirements for storage of such wastes are met. (40 CFR 265.198) ***(Contact ESQ Env. Compliance Specialist for assistance).***	
			29. Incompatible Wastes. Incompatible wastes/materials are not placed in same tank system. (40 CFR 265.199)	
			30. Air Emissions. If 40 CFR Part 265, Subpart AA, BB, or CC standards are applicable, tank system complies with these management standards. (40 CFR 265.202) ***(Contact ESQ Env. Compliance Specialist for assistance).***	
			31. Treatment in 90-Day or Less Tanks. If tanks are used to treat waste to meet RCRA Land Disposal Restrictions (LDRs), a waste analysis plan has been developed, is maintained on-site, and was submitted to EPA/state 30 days prior to treatment. (40 CFR 262.34(a)(4)) ***(Contact ESQ Env. Compliance Specialist for assistance).***	
			32. State-Specific Requirements. Tank system meets state-specific requirements. ***See Project Waste Mgmt. Plan for requirements.***	
Containment Buildings (APPLICABLE TO BULKY, NONLIQUID HAZARDOUS WASTES (e.g., lead-bearing materials from batteries) NOT AMENABLE TO ACCUMULATION, STORAGE, OR TREATMENT IN CONTAINERS OR TANKS.				
			33. Enclosed. Building is completely enclosed (floor/walls and roof), self-supported and can support the waste and daily operating activities. (40 CFR 265.1100(a))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			34. Barrier. Building has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel and equipment. Barrier is free of significant cracks, gaps, corrosion or other deterioration that could cause release of waste. (40 CFR 265.1101(a)(4) and (c))	
			35. Compatibility. Surfaces are chemically compatible with wastes that come into contact with them. (40 CFR 265.1101(a)(2))	
			36. Amount of Waste. Level of waste within containment walls does not exceed height of wall. (40 CFR 265.1101(c))	
			37. Decontamination. Building has decontamination area and procedures to prevent tracking waste out of building. (40 CFR 265.1101(c))	
			38. Fugitive Dust Control. Fugitive dust is controlled so that openings (doors, windows, vents, cracks, etc.) exhibit no visible emissions during normal operating conditions including when vehicles enter and exit unit. If particulate collection devices are used (fabric filter, electrostatic precipitator) these devices are operated and maintained. (40 CFR 262.1101(c))	
			39. Liquids Management. If containment building is used to store/treat wastes with free liquids, the following requirements are met: (40 CFR 265.1101(b))	
			a. **Primary Barrier.** The primary barrier is designed to prevent the migration of hazardous constituents into the barrier	
			b. **Liquid Collection/Removal.** Liquid collection system minimizes accumulation of liquids on primary barrier -- Primary barrier is sloped to drain liquids to collection system and liquids/waste are collected/removed to minimize hydraulic head on containment system at earliest practicable time.	
			c. **Secondary Containment.** The secondary containment system includes a secondary barrier designed and constructed to prevent migration of hazardous constituents into barrier and leak detection system capable of detecting failure of primary barrier and collecting accumulated wastes/liquids. ***(Contact ESQ Env. Compliance Specialist for assistance).*** (Note: Leak detection system requirement is met if bottom slope is 1% or more and constructed of granular drainage material with hydraulic conductivity of 1×10^{-2} or more and 12 inches thick or constructed of synthetic/geonet drainage materials with transmissivity of 3×10^{-5} m^2/sec or more)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			d. **Treatment.** If treating in building, treatment area must be designed to prevent release of liquids, wet materials, or liquid aerosols to other portions of building.	
			e. **Chemically Resistant.** Secondary containment system is constructed of materials that are chemically resistant to waste and liquids managed and of sufficient strength and thickness.	
			40. PE Certification. On-site files contain PE Certification that containment building is designed in accordance with 40 CFR 265.1101(a) through (c). (40 CFR 265.1101(c)(2)).	
			41. Release. If condition detected that could cause or has caused a release of waste, the following has been conducted: (40 CFR 265.1101(c)(3))	
			a. **Repair.** Condition was promptly repaired and any cleanup was conducted.	
			b. **Recordkeeping.** Condition/release is recorded in operating record.	
			c. **Notification.** Within 7 days notify EPA and within 14 working days provide written plan of steps taken to repair/cleanup.	
			d. **PE Certification.** After repairs performed, provide EPA with PE certification that repairs/cleanup conducted in accordance with written plan.	
			42. Inspection. Building is inspected once every 7 days and results are recorded in project log book/inspection log. (40 CFR 265.1101(c)(4)) (Inspection should include monitoring/leak detection equipment data, containment building and surrounding area for signs of release/deterioration).	
			43. Areas With and Without Secondary Containment. If building contains areas with and without secondary containment: • Each area is designed and operated to meet specified requirements, • Measures are taken to prevent release of liquids/wet materials into areas without secondary containment; and • Operating log provides written description of procedures used to maintain integrity of areas without secondary containment. (40 CFR 265.1101(d)).	
			44. Closure. Upon leaving the project site, plans are in place to ensure storage area meets 40 CFR 265.111 decontamination/closure requirements. (40 CFR 265.179) ***(Contact ESQ Env. Compliance Specialist for assistance).***	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			45. Accumulation Time. Waste is stored in building for 90 days or less, unless an extension has been obtained. Project operating record/log book documents that unit is emptied at least once every 90 days or procedures are being used to ensure waste volume remains in unit no more than 90 days. (40 CFR 262.34(a)(1))	
			46. Recordkeeping. The following records are kept:	
			a. Procedure to ensure that each waste volume remains in the unit for no more than 90 days, **OR**	
			b. Written description of waste generation and management practices for facility showing that they are consistent with respecting 90 day limit and documentation that procedures are complied with. (40 CFR 264.34(a)(1)).	
			47. State-Specific Requirements. Containment building meets state-specific requirements. ***(See Project Waste Mgmt. Plan for requirements).***	
Training				
			48. General. Personnel have completed waste management training that teaches them to perform their duties (general and function specific to their tasking). Training has been conducted within 6 months after project start & untrained personnel are supervised. (40 CFR 265.16(a) and (b)). This training is in addition to HAZWOPER requirements and if persons are involved with a DOT related hazardous material function, must also have DOT/HAZMAT Security training.	
			49. Annual Refresher. Personnel have undergone annual waste management refresher training. (40 CFR 265.16(c)). DOT/HM Security is every 2 years *(Tt policy because our training includes air shipment module which is more stringent than DOT rail, highway, vessel modes).*	
			50. Personnel Records. Records are maintained on-site which include: job title of each position at facility and name of person filling it; job description of each position; written description of type/amount of training for each position; records documenting training. (40 CFR 265.16(d))	
			51. Training Records. Training records are kept on-site until project closure. If employee leaves, records are kept for at least 3 years from date of last employment. (40 CFR 265.16(e))	
Preparedness and Prevention				

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			52. Management. Project is managed to minimize the possibility of fire, explosion, or any sudden releases to the environment. (40 CFR 265.31)	
			53. Testing. Emergency equipment is tested/maintained to assure proper operation and records are kept of testing. (GMP; 40 CFR 265.33)	
			54. Waste Handling Procedure. Whenever waste is being poured, mixed, spread, or handled, all personnel have immediate access to internal alarm or emergency communication device. When only one employee is on-site, he/she has immediate access to communication device. (40 CFR 265.34)	
			55. Local Arrangements. Arrangements have been made with emergency response agencies. (40 CFR 265.37)	
Contingency Planning (NOTE: THESE REQUIREMENTS MAY BE COVERED IN THE SITE-SPECIFIC HEALTH & SAFETY PLAN)				
			56. Hazardous Waste Contingency Plan. Facility has a HWCP (or SPCC Plan which has been amended to include hazardous waste requirements). The plan includes requirements specified in 40 CFR 265.52. (40 CFR 265.51 and .52) ***(Contact ESQ Env. Compliance Specialist for assistance).***	
			57. Copies. HWCP is maintained at the project site and was submitted to local emergency response agencies, as appropriate. (40 CFR 265.53)	
			58. Revision of HWCP. HWCP is reviewed and amended immediately when: a. regulations change, b. plan failed in an emergency, c. increased potential for emergency from changes in project/facility, d. list of emergency coordinators changes, and e. list of emergency equipment changes. (40 CFR 265.54)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			59. Emergency Coordinator Responsibilities. On-site emergency coordinator is familiar with HWCP, operations, location/characteristics of wastes, location of records, facility layout; on-call or on-facility (or has designated alternate); is authorized to commit resources to implement HWCP. (40 CFR 265.55)	
			60. Implementation of Plan. During emergency, requirements/ responsibilities of emergency coordinator, implementation of plan, and notification were properly conducted. (40 CFR 265.56)	
Offsite Transportation/Disposal				
			61. Transporter. Hazardous wastes are offered only to transporters with proper EPA Identification Numbers. (40 CFR 262.12(c))	
			62. Prequalification. Hazardous wastes are transported by and disposed only by pre-approved qualified transporters and disposal, treatment or recycling facilities. (Contact Project Procurement staff or Project ESQ Env. Compliance Specialist to verify these vendors were approved prior to waste shipment). See Procedure EHS1-4.	
			63. Manifesting. Completed manifests are used each time a regulated hazardous waste is transported off-site. All required data has been inputted and manifest is properly signed by both the generator & transporter. (40 CFR 262.20-.23; 49 CFR 172.604) **If TtEC personnel sign manifest, there is written authorization from the generator and this authorization has been reviewed by both the ESQ and Legal Departments.**	
			64. Packaging/Labeling/Placarding. Prior to off-site transport each hazardous waste is: a. Packaged & labeled in accordance with DOT requirements. b. If 110 gallons or less, marked with commercial label designated "Hazardous Waste" and contact information c. Marked with generator's name, address, and manifest document number d. Placarded in accordance with DOT requirements. (40 CFR 262.30 - .32)	
Onsite Disposal (*If hazardous waste is being disposed at client's facility, or onsite disposal is part of remedial activity, complete the "Hazardous Waste: RCRA Permitted Facility" checklist.)*				

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Recordkeeping *Note: These are generator requirements; Tetra Tech normally is not a generator, but assists clients in managing their wastes. However, Tetra Tech may keep some or all of these records depending upon contractual requirements. It is imperative to keep records if Tetra Tech is involved in off-site transport or disposal.*				
			65. Records. Records are kept on-site for at least 3 years (or in project files if project ends earlier) of the following: a. copy of generator-signed manifest b. copy of exception reports c. copy of Biennial Hazardous Waste Report (or state equivalent) d. records to characterize wastes. (40 CFR 262.40)	
			66. Biennial/State Report. Biennial Haz. Waste Report has been prepared and submitted by March 1 of each even numbered year or according to timing and schedule of state requirement. (40 CFR 262.41) *Note: Determine what Tetra Tech scope of work is. At a minimum, Tetra Tech should provide client with notice that Biennial Report is required.*	
			67. Exception Reports. If copy of signed manifest from TSDF is not received within 35 days from off-site transport, transporter was contacted. If the manifest was not received within 45 days, an Exception Report was submitted to the EPA (or State). (40 CFR 262.43)	
			68. LDR Certification/Notices/Waste Analysis. Copies of all data to support characterization (either based upon knowledge of waste or testing), notices, certifications, demonstrations are kept on-site/in project files for at least 5 years. (40 CFR 268.7(a)(5))	
Land Disposal Restrictions				
			69. Notice/Certification. LDR Notification forms are submitted with the first off-site shipment of each particular RCRA hazardous waste to a TSDF, **OR** generator has provided Certification form that waste is not prohibited from land disposal and waste meets LDR treatment standards. (40 CFR 268.7(a))	
			70. Exemption. If waste is determined to be exempt from RCRA Subtitle C subsequent to the point of generation, a one-time notice stating this determination is placed in the project files. (40 CFR 268.7(a)(6))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			71. Debris. ***(Note: Contact Project Env. Compliance Specialist for assistance).*** (40 CFR 268) Debris which contains a listed haz. waste (i.e., F, K, P or U codes) or exhibits a characteristic (i.e., D001-D043 codes) has: a. Obtained a "contained-in" determination by EPA; b. Has been treated and meets the LDR Debris performance standards and therefore is no longer regulated as hazardous; OR c. Meets the LDR standards and applicable Universal Treatment Standards. (Residues from treatment of hazardous debris must be managed as a hazardous waste and meet 40 CFR 268 standards prior to land disposal.)	

--End of Checklist--

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EHS 3-3 ATTACHMENT C

TETRA TECH EC, INC.

PESM INSPECTION CHECKLIST— LEAD-BASED PAINT ABATEMENT/ASSESSMENT/SAMPLING

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Project:	**Inspector:**	**Date:**

Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**
			General Requirements	
			1. **Scope of Activities.** Project involves the following activities. *Please circle those that are applicable.* a. Assessment b. Sampling c. Abatement d. Other: _____	
			2. Certifications. Check on that the following certifications are in order: **Training Programs**: Contractor(s) who performs lead-based paint abatement, assessment, sampling, etc., has been trained under a current certification program that took effect on 6/23/2008. **Firms:** Ensure that the contractor firm has applied for certification on or after 10/23/2009. [**Note:** On or after April 22, 2010, no firm may perform, offer, or claim to perform renovations without certification from EPA under §745.89 in target housing or child-occupied facilities.] **Individuals:** Ensure that on or after 4/22/2010, all renovations are directed by renovators certified in accordance with §745.90(a) and performed by certified renovators or individuals trained in accordance with §745.90(b)(2) in target housing or child-occupied facilities. **Note:** There are some exceptions to the above. Check with ESQ if any of the certifications are lacking.	
			3. Permits. Notification submitted or permit issued prior to commencement of lead-based paint abatement, assessment, sampling, etc., activities. Verify that permits have been obtained and that project is operating in compliance with the terms/conditions of such permits. (State/local regulations) **Note:** On or after April 22, 2010, all renovations must be performed in accordance with the work practice standards in §745.85 and the associated recordkeeping requirements in §745.86(b)(6) and (b)(7) in target housing or child-occupied facilities.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			4. Cleanup Standards. Ensure that project is complying with federal/state cleanup requirements. (Federal/State/local regulations) **Note:** Federal clearance levels are found in §745.227.	
			5. Record-keeping. Ensure that all records and certifications pertaining to the renovation or remediation are being retained for a period of three years following completion of the renovation. Specific record-keeping requirements are listed in §745.86	
			6. OSHA. OSHA specifies requirements for workers conducting lead-abatement activities. Review SHSP implementation requirements. Discuss with ESS how requirements are being met at the Site.	

Waste Generation/Management/Disposal *(If hazardous wastes are being generated, also refer to Hazardous Waste: Storage Treatment Disposal in Less than 90 days Checklist)*				
			7. Recognized Test Kits. Ensure that only EPA recognized test kits for lead are being used at the project site. **Note:** This regulation took effective June 23, 2008.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			8. **Waste Characterization.** Waste has been characterized in accordance with hazardous or special waste requirements. EPA suggests the use of the guidance, "Applicability of RCRA Disposal Requirements to Lead-Based Paint Abatement Wastes," (EPA 747-R-93-0006). The following are EPA's recommendations for characterizing various waste streams. State and local regulations also need to be evaluated. All items must either be tested to determine if they are hazardous or generator knowledge must be used to characterize. a. **Bulk Items (Wood, Plaster, Doors, etc.).** Generally hazardous when the lead level in the paint exceeded 4 mg/cm^2. This threshold is not EPA policy. b. **Paint Chips/Dust/Debris.** May be hazardous or non-hazardous. c. **HEPA Filters/ HEPA Vacuum Debris.** May be hazardous or non-hazardous. d. **Stripping Sludge/Unfiltered Liquid Waste.** May be hazardous or non-hazardous. e. **Disposable Work Clothes.** Generally considered non-hazardous. f. **Respirator Filters.** Generally considered non-hazardous. g. **Filtered Wash-water.** Generally considered non-hazardous. h. **Plastic Sheeting and Tape.** Generally considered non-hazardous, unless a heat gun is used for paint removal or if enclosure or encapsulation abatement methods are used.	

--End of Checklist--

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT

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Project:	Inspector:	Date:
Yes No N/A	**REQUIREMENTS**	**COMMENTS/NOTES**

This checklist applies when petroleum, oil, or hazardous substances are stored, used, or handled on the project site or transported on- or off-site.

General Requirements				
			1. **Oil/Water Separators.** Project involves the maintenance/pumping/ inspection of oil water separators. Proper waste management procedures are being implemented depending upon final disposition of pumped out product, sludges, etc. *Complete applicable EHS 3-3 Solid or Hazardous Waste Checklists.*	
			2. **State Regulations.** State/local regulations specify requirements for oil storage, handling or disposal which are more stringent than requirements specified in this checklist. *Check the Site Health and Safety Plan to determine if State/local regulations are applicable.*	
			3. **Fire Marshall Approval.** Project involves aboveground storage of oil (or other hazardous substance). State/local fire department may require approval of the design, location, handling procedures, etc. for oil storage. Check the Site Health and Safety Plan to see if these criteria have been met.	
			4. **Uniform Fire Code Requirements.** Storage of hazardous materials in certain amounts must comply with UFC requirements which include: permitting, incompatibility, posting, security, construction/maintenance requirements for tanks, containers, cylinders, pipe/valve/fittings criteria, placard, plan requirements, drainage, secondary containment, ventilation, etc. Specific requirements apply to storage/handling/use of oxidizers, reactive/water-reactive materials, cryogenic, highly toxic and toxic materials, corrosives, carcinogens, irritants, sensitizers, radioactive materials, organic peroxides, toxic and highly toxic compressed gases, and flammable solids/gases/liquids. The local fire department has informed project how to comply with these requirements. ESS has documented in project file any local requirements and requirements are being met.	
			5. **Oil Product Handling/Disposition.** Project involves the storage/disposition of oil product. The method by which the oil will be dispositioned will dictate the management/disposal requirements. *Complete waste checklists as appropriate. For example, the "Hazardous Waste Storage, Treatment and/or Disposal in Less than 90 Day Checklist", or the"Solid Waste Checklist."*	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			Spill Prevention Control and Countermeasure Plan (SPCC Plan) *Applies when oil is stored, transported or handled in the following quantities: Total aboveground storage is 1,320 gallons or more. Since requirement applies to "facilities," discuss with client the quantities of oil stored at its facility to ensure total "facility" volumes (including project site) are properly calculated. NOTE: The December 2008 Amendments have streamlined requirements for some facilities, however the effective date has been delayed – check with ESQ Dept. to find out current date. See Zip Bulletin 260 or check with ESQ Environmental Compliance Specialist for assistance. (Note: Requirements regulating completely buried tanks (which are already subject to all UST requirements) have been vacated.)*	
			6. **Development.** SPCC plan has been developed and project was constructed and is operating in compliance with its requirements. (40 CFR 112)	
			7. **Contents.** SPCC plan states that it meets all plan requirements as stated in 40 CFR 112.	
			8. **Certification.** Plan has been certified by a PE and contains appropriate management approvals, unless it meets the conditions for "self certification." (40 CFR 112.7); *See ZIP Bulletin 260*	
			9. **Project Drainage.** Facility drainage meets the following standards: a. For diked storage areas, drainage is restricted by valves, which are preferably manual open/close variety, and pumps/ejectors are manually activated and inspected. b. Undiked areas drain into ponds, lagoons or catchments basins which are designed not to flood. c. If treatment units are used, drainage is designed to gravity flow or flow into back-up pumping systems. d. Drainage is engineered to prevent oil from reaching navigable waters. (40 CFR 112.7(e)(1))	
			10. **Containment/Diversionary Structures.** Appropriate containment/ diversionary structures are at project site which may include: dikes, berms, retaining walls, curbing, culverts, gutters, drainage systems, weirs, booms, other barriers, spill diversion ponds, retention ponds, and sorbent materials. (40 CFR 112.7(c)).	
			11. **Spill Control/Cleanup Equipment.** Spill control materials are located on project site and may include: sorbent materials, oil retention booms, sand bags/temporary curbing devices, fuel recovery pumps/collection hoses, fuel recovery tank trucks, and protection equipment for project staff. (40 CFR 112.7(c))	
			12. **Drainage Water Quality.** Discuss spill history with ESS and determine if any oil spills to containment systems/drainage areas/anywhere on project site have occurred? Determine if procedures followed were in compliance with SPCC Plan and TtEC requirements.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			13. On-shore Bulk Storage. Bulk storage tank system complies with standards which include tank structure compatibility, secondary containment/alternative drainage, specific drainage requirements, periodic testing/inspections, tanks alarms, pumps and level sensors. (40 CFR 112.7(e)(2)) *Note: Check regional EPA definition of "bulk" storage which normally includes any aboveground storage greater than 12,000 gallons.*	
			14. Testing. Periodic integrity testing (including tanks supports/foundations/ internal heating systems, etc.) is being conducted. In addition, piping systems are pressure tested once per year. Project files document testing results. (40 CFR 112.7(e)(2) and (3))	
			15. Loading/Unloading. Loading and unloading procedures meet DOT requirements; project personnel are in continuous attendance during loading/unloading; if no catchment basin, quick drainage system is used, and lower most drain and all outlets are inspected for leaks after tank filling. (40 CFR 112.7(e)(8))	
			16. Security. Appropriate security is maintained at project site. (40 CFR 112.7(e)(9))	
			17. Recordkeeping. The following records are maintained: a. Copy of SPCC plan is kept at project site if it is normally attended more than 8 hours per day; otherwise it is kept at the nearest field office. b. Inspection records are kept for at least 3 years, including: written inspection procedures, inspections which are signed and dated by inspector, and notes describing repairs. (GMP; 40 CFR 112.7(e)(8))	
			18. Amendments. Material change in project design, construction, operation, or maintenance that alters potential for oil spill has occurred and the SPCC Plan has been amended. (40 CFR 112.5)	
			19. Review. SPCC Plan has been reviewed within last 5 years. If revisions were required, such revisions were made within 6 months of review. (40 CFR 112.5).	
			20. Designated Project Staff. A designated person is responsible for overall spill prevention. This person conducts workplace safety evaluations and inspections. (40 CFR 112.7(e)(10))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			21. Release. Has more than 1,000 gallons spilled in a single incident or "harmful quantity" been discharged in 2 incidents within 12 months? Reporting to EPA/state has been conducted. (40 CFR 112.4) *Note: In addition, CWA requires immediate notification/written notification for releases to waters of the US that causes a sheen. Notifications are made to the National Response Center Hotline (800-424-8802) and the State's Spill Hotline.*	
			22. Training. Project staff involved with management/handling of oil take part in periodic training in spill prevention/response. (40 CFR 112.7(e)(10))	
			23. Inspections. Inspections are conducted daily in accordance with SPCC plan.	
			24. Release of Accumulated Containment Liquids. Confirm with ESS procedures for releasing accumulated storm water from secondary containment surrounding tank. Is it documented on daily inspection documentation? a. Water is inspected for visible signs of contamination prior to release b. Water is removed daily, or as necessary to prevent excessive accumulation	
Facility Response Plan (*Applies if storage of greater than 1 million gallons of oil and certain location criteria/lack of secondary containment exists or involves transfer of oil over water from vessel to vessel.) For example, oil refineries and terminals.*				
			25. Develop/Submit Facility Response Plan. Facility response plan was developed in accordance with 40 CFR 112.20 and **submitted** to EPA in a timely manner for the project activities. (40 CFR 112.20)	
			26. No Substantial Harm. Project meets criteria of storage capacity/location but has requested an exemption because it believes "no substantial harm" will occur. (40 CFR 112.20(e))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Hazardous Materials Storage *(Applies to storage of virgin hazardous materials, not hazardous and non-hazardous wastes)*				
			27. OSHA Hazardous Communication. Health and Safety Inspection has been conducted which addressed OSHA Hazardous Communication requirements. (29 CFR 1910.1200)	
			28. Hazardous Chemical Inventory Reporting. (EPCRA Section 312) Project site handles/stores: a. 10,000 pounds or more of a hazardous chemical; OR b. 500 pounds or the threshold planning quantity (TPQ) (whichever is less) of an extremely hazardous substance (EHS); c. Then project must submit a list of hazardous substances/copies of MSDS to state commission, local committee, and local fire department. (40 CFR 370)	
			29. Toxic Chemical Release Reporting. (EPCRA Section 313) Project involves work at a facility that manufactures or processes 25,000 pounds of a toxic chemical or uses 10,000 pounds of a toxic chemical, the client's facility is SIC code 20 - 39, AND it employs more 10 or more full-time employees. A Toxic Chemical Inventory Release Report must be submitted by March 1 of each year. (40 CFR 372) *Note: Site often only provides information to client for their reporting purposes. If Section 313 reporting is applicable, ensure project files reflect actions taken.*	
			30. Emergency Planning and Response. (EPCRA Section 301-303).Project stores extremely hazardous substances on-site above TPQ. State commission was notified within 60 days of commencing on-site work. The information provided to commission is up-to-date. (40 CFR 355.30) *Note: OSHA also has emergency planning requirements which should have been addressed in H&S inspection.*	
			31. Release. (EPCRA 304) Has a release of a hazardous substance occurred on the project site? If so, was the National Response Center and state/local agencies contacted verbally and in writing as required? (40 CFR 302 and 355, state/local regulations)	

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Project:	Inspector:	Date:

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
Hazardous Materials Transportation (*This section applies if DOT "hazardous materials", which may include hazardous wastes, are being transported on "public roads." Requirements are GMP for transport on private/in-facility roads.)*		
	32. **Shipping Papers/Manifests.** Discuss procedures for receipt and review of shipping papers with ESS. Ensure shipping papers are completed, reviewed, and approved by Tetra Tech EC personnel/client for shipment of samples, project-specific chemicals, etc	
	33. **Packaging/Labeling/Marking.** Based upon the classification of the hazardous material, the proper DOT packaging/labeling/marking is being chosen and the materials are being packaged by an employee/subcontractor who has been properly DOT trained. (40 CFR 172)	
	34. **Training.** Tetra Tech EC employees/subcontractor employees performing DOT functions have been trained at least every 3 years. (Bi-annually for IATA Shipments). Documentation of training is located at the project site. (40 CFR 172, Subpart G)	
	35. **Placarding.** Placards are being offered to transporter prior to shipment offsite. (40 CFR 172.500)	
	36. **Transportation in Tetra Tech EC Vehicle.** Project involves the transportation of hazardous materials (e.g., samples, supplies) on public roads in company vehicles. TTEC Shipping Paper was used to transport hazardous materials. Packaging, labeling, and training requirements also being complied with. *Note: Materials of Trade Exemption may apply.*	
	37. **International Shipments.** Project involves shipment of hazardous materials across international boundaries or through international waters. Shipment complied with International and/or other foreign country transportation and environmental requirements.	
	38. **Prequalification**. Review transporters used at project site and ensure all were pre-qualified prior to use. *(See EHS 1-4)*	

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	39. DOT HM Security Plan. Project is required to have an HM Security Plan if project ships hazardous waste or hazardous materials in bulk containers having any of the following capacities: • 17.3 cubic yards for solids (Ex.: 20 cubic yard capacity roll-off container, end dump, dump truck, etc.); or • 3,500 gallons for liquids (Ex.: 5,000 gallon capacity tanker truck); or • Shipment is required by DOT regulations to be placarded (Ex.: More than 1,000 pounds of HM, except for Class 9). (49 CFR 172 Subpart 800)	

--End of Checklist--

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES

This checklist applies if project involves the management, generation or disposal of PCBs 50 ppm or greater (this includes PCB containing electrical equipment/transformers, PCB liquids, soils/rags from cleanup of 50 ppm PCB spill, and containers storing such materials). Exemptions as outlined in this checklist may apply for management/cleanup of PCBs conducted under CERCLA and spills which occurred prior to 1978 when the anti-dilution provisions of TSCA became effective. This checklist does not address state-specific requirements for PCBs less than 50 ppm. State regulations must be consulted for those requirements.

Yes	No	N/A	Requirements	Comments/Notes
General Requirements				
			1. **PCBs 50 ppm or greater.** Liquid, transformer, capacitor, rags, debris, soil or other article/environmental media have been determined to contain PCBs at concentration 50 ppm or greater. (40 CFR 761.1(a))	
			2. **PCBs Resulting from Spill/Concentration Less than 50 ppm.** Determination has been made that materials/environmental media contaminated by PCBs resulted from a spill that occurred after 1978 and the material spilled contained 50 ppm or greater PCBs. (40 CFR 761.1(a))	
			3. **PCBs Resulting from Spill/CERCLA Activity.** Project is being conducted under CERCLA/IRP and a determination has been made that materials/environmental media contains 50 ppm or greater PCBs. (EPA Superfund Guidance -- PB90-274432 and OSWER 9355.4-01)	
			4. **Awaiting Analytical.** PCB wastes are being stored awaiting analytical regarding PCB concentration.	
Storage 30 Days or Less *(Applies if PCBs are stored at project site for 30 days or less.)* *Note: See General Requirements for additional requirements applicable to less than 30-day storage areas.*				
			5. **Designated Area.** A designated area has been established for accumulation of PCB wastes. (GMP)	
			6. **Accumulation Time.** Waste tracking log shows PCB wastes are stored in designated area for 30 days or less. (40 CFR 761.65(c)(1))	
			7. **PCB Article/Type of Wastes.** Only the following PCB wastes are stored:	
			a. Non-leaking PCB articles/PCB equipment.	
			b. Leaking PCB articles/equipment if placed in non-leaking container with sufficient absorbent.	
			c. PCB Containers containing non-liquid PCBs (soil/rags/debris).	
			d. Liquid PCBs between 50 and 500 ppm stored in containers. A Spill Prevention Control and Countermeasure Plan has been prepared in accordance with 40 CFR 112 and each container bears notation that liquids in drums do not exceed 500 ppm PCBs. (40 CFR 761.1.65(c)(1))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			e. Non-leaking/structurally undamaged PCB Large High Voltage Capacitors/PCB-Contaminated Electrical Equipment that have not been drained of free-flowing fluid are stored on pallets next to greater than 30 day storage facility and storage area has immediately available unfilled storage space to 10 percent of volume of capacitors/equipment stored outside. (40 CFR 761.65(c)(1))	
1-Year Storage Facility (*Applies if PCBs are stored at project site for less than 1 year, but greater than 30 days*) *Note: See General Storage Requirements for additional requirements applicable to greater than 30-days, but less than 1-year storage areas.*				
			8. **Accumulation Time.** Waste tracking log indicates PCB wastes are disposed of within 1 year of being placed into storage.	
			9. **Roof and Walls.** Storage facility has adequate roof and walls to prevent rain water from reaching PCBs and PCB Items. (40 CFR 761.65(b))	
			10. **Curbing.** Floor has continuous curbing with minimum six inch high curb.	
			11. **Containment.** Floor/curbing have containment volume equal to at least two times the internal volume of the largest PCB Article/PCB Container stored therein or 25% of all PCB Articles/Containers, whichever is greater.	
			12. **Impervious Material**. Floor/curbing are constructed of continuous smooth and impervious materials to prevent/minimize penetration of PCBs.	
			13. **Floodplain**. The facility is not located at a site that is below the 100-year flood water elevation.	
General Storage Requirements (*Applies to storage of PCBs in both: 1) Less than 30-day and 2) Greater than/equal to 30 days, but less than 1-year storage areas)*				
			14. **Marking Storage Area.** Storage area is clearly marked with "Caution-PCB" sign. (40 CFR 761.40(a)(10))	
			15. **Marking Containers.** PCB Containers/Article Containers are clearly marked with "Caution-PCB" mark and Out of Service Date (i.e., the date the item was removed from service or waste was generated) is clearly visible. (40 CFR 761.40(a) and 761.65(c)(1))	
			16. **Management.** Storage area is managed so that PCB Articles/Containers can be located by date they entered storage.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			17. **Decontamination of Equipment.** Movable equipment used to handle PCBs/PCB Items in storage facility that comes in direct contact with PCBs has been decontaminated by swabbing surfaces contacted with PCBs with a solvent that contains less than 50 ppm PCBs/solubility 5 percent or more by weight prior to removal from area. (40 CFR 761.65(c)(4) and 761.79)	
			18. **Inspection.** All PCB Articles/Containers are checked for leaks at least once every 30 days. Inspection forms are maintained in on-site project files. (40 CFR 761.65(c)(5))	
			19. **Leaking Articles/Containers.** Leaking PCB Articles and PCB Containers and contents are transferred immediately to properly marked non-leaking containers. Spilled material is cleaned up immediately and PCB-contaminated material is disposed in incinerator or chemical waste landfill. (40 CFR 761.65(c)(5) and 761.60(a)(4))	
			20. **Container Requirements**. PCBs are contained in DOT Specification Containers. (49 CFR 172.101, GMP)	
			21. **One-Year Disposal Requirement.** PCB Articles/Containers are removed from storage and disposed of within one year from the date when they were first placed in storage. (40 CFR 761.65(a))	
PCB Stockpile Storage *(Applies to soils and other solid PCB wastes stored in stockpiles)*				
			22. **Accumulation Time.** Waste tracking log indicates PCB waste stockpiles are stored less than 180 days.	
			23. **Type of Wastes.** Only solid, non-flowing PCB solids may be stored in stockpiles.	
			24. **Containment.** The stockpile is covered when not in use to control dispersal by wind or water. Water is not used to prevent wind dispersal.	
			25. **Leachate.** No leachate is generated as a result of storage in the stockpile	
			26. **Liner.** Stockpiled waste is placed on a liner that prevents PCBs from migrating into soil or groundwater.	
			27. **Storm Water Protection.** Adequate run-on controls are present to withstand a 25 year storm event. Water ??	
Decontamination				
			28. **Container Decontamination.** PCB containers are decontaminated by 1) flushing internal surface of container at least 3 times with a solvent that contains less than 50 ppm PCBs/solubility 5 percent or more by weight prior to removal from area; 2) each rinse is at least 10 percent of the container's volume; and 3) rinse/solvent/residue is disposed of in accordance with 40 CFR 761.60. (40 CFR 761.79)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			29. Staging Area. Decontamination is conducted in engineered staging area where all rinsates/solvents/residues are collected in a sump or other containment system.	
Disposal				
			30. All PCBs. PCB-contaminated items, and materials are disposed of in an EPA-approved incinerator, high efficiency boiler, or chemical waste landfill, as required under 40 CFR 761.60.	
PCB Spill Cleanup Policy (*Applies if PCB from current or recent spill is being cleaned up (e.g., contaminated soil, concrete pads, buildings, containers, etc.)*)				
			31. Historical Spills. If spill occurred prior to May 4, 1987, it is a historical spill and cleanup is complying with case-by-case cleanup criteria established by EPA. Project files contain documentation outlining the cleanup criteria. (40 CFR 761.120(a)(1))	
			32. Current Spills. If spill occurred after May 4, 1987 (except those specified in 3 below), it is a current spill and is meeting the requirements of 40 CFR 761.125(a) and (b), unless EPA has specified more/less stringent cleanup criteria. (40 CFR 761.120(a)(3), (b), and (c))	
			33. Notification/Recordkeeping. EPA was notified as soon as possible (no later than 24 hours) if the spill directly contaminated surface water, sewer, drinking water, grazing lands, or exceeded 10 pounds. National Response Center was also contacted if spill exceeded 1 pound. Cleanup was begun immediately in accordance with the PCB Spill Cleanup Policy. (40 CFR 761.125)	
			34. Recordkeeping. Records and certifications specified in 40 CFR 761.125(a) are maintained in the project files. Records of spill/decontamination procedure were developed and are being maintained in project files. (40 CFR 761.125(a) and (b)(5))	
Recordkeeping *Note: These are generator requirements; Tetra Tech EC normally is not a generator, but assists clients in managing their wastes. However, Tetra Tech EC may keep some or all of these records depending upon contractual requirements. It is GMP to keep records if Tetra Tech EC is involved in off-site transport or disposal. Confirm that ESS understands and has documented who's responsibility it is to maintain documentation.*				
			35. Records. Project files contain the following records: a. Written annual document log regarding disposition of each PCB item prepared by July 1 for the previous year; b. Signed manifests; and c. Certificates of Disposal (40 CFR 761.180(a)). These records are kept for at least 3 years after project stops storing PCBs.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			36. **Exception Reports.** If copy of signed manifest from disposer is not received within 35 days from off-site transport, transporter was contacted. If the manifest was not received within 45 days, exception report was filed with EPA. (40 CFR 761.215)	
			37. **One-Year Exception Report.** If waste is transferred to disposer within 9 months of date of removal from service and generator has not received within 13 months a Certificate of Disposal or the Certificate of Disposal confirms waste was disposed of more than 1 year after the date of removal from service, a one-year exception report was filed with EPA. (40 CFR 761.215)	
			38. **Cleanup/Decontamination Report.** If project involves cleanup of a current spill, record/certification of cleanup/decontamination is being maintained for 5 years. (40 CFR 761.125(b)(3) and (c)(5))	
Off-Site Transportation/Disposal				
			39. **EPA Notification Number.** If the project involves storage of PCBs for more than 30 days or storage of bulk liquid PCBs in large non-DOT containers, the client has obtained an EPA Notification number. (40 CFR 761.202 and .205) *Note: Generators who do not store PCBs for greater than 30 days may use either their EPA Identification number under RCRA or the generic number "40 CFR Part 761".*	
			40. **Transporter/Disposer.** Transporters and disposers used for the project PCB wastes have EPA Notification numbers. (40 CFR 761.202(b))	
			41. **Manifesting.** Completed hazardous waste manifests are used each time a PCB waste is transported off-site. The following information is included based upon the type of PCB waste. (40 CFR 761.207) a. Bulk PCBs: identify waste, date of removal from service (Out of Service Date), and weight of PCBs. b. PCB Article Container/Container: unique identifying number; type of waste, date of removal from service, and weight. c. PCB Article not in Container: serial number/identification; date of removal from service, and weight of PCB waste in the article.	
			42. **Certificate of Disposal.** Certificate of Disposal was received by generator within 30 days of the date that PCB waste was disposed of.	

--End of Checklist--

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ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES

This checklist applies when project generates, manages, transports, or disposes of solid waste (except hazardous waste or TSCA-regulated PCB waste), including Investigation Derived Waste, special waste, unexploded/exploded ordnance, chemical warfare agents, and used oil.

General Requirements				
			1. **Waste Determination.** Waste has been characterized. (State/local regulations, TTEC Environmental Field Procedures)	
			2. **Waiting Analytical.** Wastes being stored awaiting waste determination.	
Investigation Derived Waste				
			3. **WMP Plan.** A Waste Management (WMP) Plan has been developed which identifies how IDW and other solid waste is to be characterized, managed and disposed of based upon suspected/ known contamination. IDW Plan requirements are being fully complied with. (GMP; CERCLA guidance). Circle which types of IDW are being generated. Soil cuttings — Treatment residues — Disposable Sampling Equipment Purge water — Deconwater — PPE Other:_____	
			4. **Suspected Hazardous Waste.** IDW, which is suspected of being hazardous is containerized and managed as hazardous waste until proven otherwise. (Note: If hazardous, refer to Hazardous Waste checklist for requirements. This checklist is not required.)	
			5. **Container/Stockpile Labeling.** Drums awaiting analytical results are labeled with "source/location of contents"; "contents/quantity"; "date of sampling"; "Analysis Pending", and any other requirement identified in the (WMP) Plan. If contents of drum are known, it is labeled in accordance with regulatory requirements.	
			6. **Containers are being managed in accordance with BMPs. (containers closed, inspected, tracked)**	
Special Waste/Solid Waste (*Special Waste may include petroleum-contaminated waste, soils that exceed state/federal cleanup levels but are not hazardous, PCB wastes not regulated under TSCA, etc. Solid waste may include construction debris, demolition debris, decontamination wastewater, non-hazardous soil, scrap metal, etc. Check state/local regulations for definitions.)*				
			7. **Stockpiles.** Waste is being stored in stockpiles in compliance with liner, size, covering, etc. requirements. (State/local regulations)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			8. Container Management. Waste is being stored in containers that meet condition, compatibility, closure/covering, and marking/labeling requirements. Containers are handled so as to prevent rupture/leaking. ESS demonstrates appropriate understanding of proper storage and handling.	
			9. Labeling. Waste is labeled in accordance with the WMP. ESS understands WMP requirements for labeling.	
			10. Inspections. Documented inspections are in maintained in the project files. If no regulatory requirements exist, waste and accumulation areas are inspected at least weekly. ESS demonstrates understanding of good container management procedures: a. containers kept closed, except when adding/removing wastes, b. containers handled/stored to prevent leaking/rupturing and allow for inspection, c. accumulation/storage areas are kept free of precipitation, debris, etc.	
			11. Drum/Waste Logs. Drum/Waste logs are reviewed and were noted to be up-to-date.	
			12. Treatment. Waste is being treated on-site. Regulations may require that a treatment plan be submitted for approval from the regulatory agency, permit be obtained, specified treatment goals be met, records be kept, reports submitted, etc. *Note: Complete "Air Quality" and "Wastewater/Stormwater Discharges/UIC" checklists, if applicable.* (State/local regulations)	
			13. Accumulation Time. Waste is moved off-site within time-period required by regulation (if applicable) or, if available, an extension is obtained from the regulatory agency. Extension documentation is maintained in project files. (State/local regulations)	
			14. On-Site Disposal. Waste is being disposed of on-site in accordance with state/local regulations. Permit, if required, has been obtained and project activities are in compliance with its terms/conditions. (State/local regulations)	
			15. Transportation. Transportation of waste complies with state/local solid waste and transportation requirements. Transportation vehicles are inspected in accordance with regulatory requirements. *Note: If hazardous materials being transported off-site, complete "Oil and Hazardous Substance Management" checklist.*	
			16. Off-Site Disposal. Off-site landfills which receives waste is pre-qualified under TTEC procedures. (State/local regulations)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			17. Recordkeeping. All required records are maintained in project files. These records may include inspection logs, sampling results, off-site disposal manifests/trip-tickets, agency correspondence, etc. (State/local regulations)	
			18. State-Specific Requirements. Waste management, transportation and disposal comply with other state/local regulatory requirements. (See WMP for state requirements)	
Medical/Infectious Wastes *Note: Compliance with 40 CFR 259 has been vacated by EPA. Medical/infectious waste is primarily regulated by states. Refer to WMP to determine if plan requirements are being followed for medical/infectious waste. The checklist items below are common to many state requirements and are considered BMPs. Note: DOT often regulates medical/infectious waste as a class 6.2 hazardous material due to potential for disease transmission.*				
			19. WMP. WMP addresses medical/infectious waste management. ESS understands medical waste management requirements including transportation requirements.	
			20. Segregation. Medical/infectious wastes are segregated.	
			21. Packaging. Medical/infectious waste is packaged in accordance with regulatory requirements which may include using rigid, leak-resistant packaging that is impervious to moisture, sufficiently strong to prevent tearing, and sealed to prevent leakage.	
			22. Storage. Medical /infectious waste is stored in a secure, protected area in a way that maintains integrity of packaging. Waste is maintained in a nonputrescent state.	
			23. Labeling. Untreated medical waste is affixed with label "Medical Waste" or "Infectious Waste" or "Biohazard symbol." Treated medical waste need not be labeled.	
			24. Disposal/Transportation. ESS follows and understands labeling, marking, packaging, manifesting requirements for shipping medical /infectious waste.	
			25. Disposal. Disposal facility was prequalified under TTEC procedures to dispose of medical/infectious waste.	
USDA Soil Permits				
			26. Quarantine State/Area. Project activities involve the interstate shipment or receipt of soils from on- or off-site sources and project is located within a quarantine state/area. These states include, but are not limited to, AL, AR, FL, GA, LA, MI, NC, SC, OK, PR, TN, TX. (7 CFR 301.80 , .81, .85, and .90)	
			27. Certificate/Permit. Certificate or permit has been obtained for the interstate shipment unless specific conditions are met allowing transport without a permit/certificate.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			28. Attachment of Certificate/Permit To Container/Shipping Paper. Certificate/permit is attached to outside of container holding soils or attached to bill of lading/shipping paper.	
On-Site Landfill				
			29. Design. Landfill meets design requirements specified in regulations or alternative design has been approved by state/local agency. Design requirements may include liner, cover, leachate collection/gas collection, location criteria, etc. (40 CFR 258, State/local regulations)	
			30. Permitting/Licensing. Permit/license has been obtained to construct/operate landfill. Construction/operation complies with conditions of permit. (State/local regulations)	
			31. Operation. Landfill is operating in compliance with permit including, if applicable, O&M Plan, inspection, waste acceptance, monitoring, reporting, and recordkeeping requirements. (40 CFR 258, State/local regulations)	
			32. Stormwater. individual NPDES Stormwater permit has been obtained or coverage under a multi-sector/general permit has been obtained. *Complete "Wastewater/Stormwater Discharges/UIC" checklist to evaluate compliance.*	
Unexploded Ordnance/Ordnance Explosive Waste/Chemical Warfare Material				
			33. Site-Specific UXO Work Plan. A site-specific workplan has been developed for the project.	
			34. UXO Team On-site. UXO team is on-site to oversee all operations which have potential for UXO/OEW.	
			35. Management. OEW and CWM may be RCRA regulated material. *Complete "Hazardous Waste" checklists, as appropriate.*	
Used Oil *Note: State regulations may require that used oil be managed as a hazardous waste. If so, skip this section and complete the "Hazardous Waste" checklist.*				
			36. Testing. Used oil has been tested and determined: a. Not to be mixed with a listed hazardous waste. b. If mixed with a characteristically hazardous waste, it does not exhibit a characteristic of hazardous waste. c. Not contain more than 1,000 ppm total halogens unless it is documented that it does not contain a hazardous waste. (40 CFR 279.10, State regulations)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			37. Prohibitions. Used oil is: a. Not managed in a surface impoundment or waste pile. b. Used as dust suppressant without state/EPA approval. c. Burned in units, except industrial furnace, boiler, utility boiler, used oil fired space heater or hazardous waste incinerator. (40 CFR 279.12, State regulations)	
			38. Storage. Used oil is stored as follows: a. In tank/container/unit subject to regulation under 40 CFR 264/265. b. Container/tank is in good condition. c. Labeled with words "Used Oil." d. Fill pipe connecting to UST is labeled with "Used Oil". (40 CFR 279.22, State regulations) *Note: Storage may also need to comply with SPCC plan requirements under 40 CFR 112 or UST requirements under 40 CFR 280. Complete "Oil and Hazardous Substances Management" and "UST/AST Installation and Closure" checklists, as appropriate.*	
			39. Oil-Fired Space Heaters. Used oil is burned in generator's (client's) space heater which has rated capacity of no more than 0.5 mmBtu/hr. (40 CFR 279, State regulations)	
			40. Off-Site Shipment. Used oil is being shipped by a transporter with an EPA Identification number or under tolling agreement where reclaimed oil is returned to project site/client's facility. (40 CFI 279.24, State regulations)	
			41. Off-Site Disposal. Used oil is transported to a facility that has been approved for used oil recycling/disposal and prequalified under TTEC procedures.	
			42. DOT Compliance. Used oil is transported in accordance with DOT requirements including shipping papers, packaging, marking, labeling, and placarding. *Complete "Oil and Hazardous Substances Management" Checklist to evaluate compliance.* (49 CFR 171-178)	

--End of Checklist--

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE TANK INSTALLATION AND CLOSURE

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Project:	**Inspector:**	**Date:**

Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**

This checklist applies when project involves the installation, closure or corrective action of underground or aboveground storage tanks that store hazardous substances/oil. Under federal regulations, regulated USTs include tank systems used to contain hazardous substances/oil the volume of which is 10% beneath the ground. The following are not regulated USTs: heating oil tank used for consumptive use on premises, septic tanks, surface impoundment, pit, stormwater/wastewater collection, flow through process tanks, tanks which contain de minimum amounts of hazardous substances, hazardous waste tanks, wastewater treatment units that are part of a POTW/NPDES permitted facility, equipment/machinery that contains hazardous substances for operational purposes, emergency spill/overfill tanks that are emptied immediately, and tanks which are less than 110 gallons.

PESM should reference 40 CFR Part 282, especially Appendix A to Part 282 which details various State requirements incorporated by reference for states that have State administered UST programs to ensure State requirements are being met.

General Information				
			1. Activity. Project involves the following activity at an UST/AST: (*Please circle applicable activity):* a. Installation b. Upgrading c. Closure: Demolition/In-place d. Investigation e. Corrective Action f. Other: _____	
			2. Type of Substance. For each UST/AST which is part of the project activities, identify the hazardous substance/oil it stores or historically has stored and its quantity in the adjacent column. Attach a table/list, if necessary.	
USTs Installed AFTER December 22, 1988 (*Applies if project involves installation /repairs of a new tank or upgrading to "new" tank requirements of a tank installed before December 22, 1988.) Note for item 4.) Not every state has the 1991 overfill prevention alternatives for overfill prevention in their state specific rules. NFPA does not have 1991 alternatives, but actually requires both 90% alert and the 95% shut off.*				
			3. Corrosion Protection. USTs meet one of following standards: a. Constructed of fiberglass-reinforced plastic (FRP); b. Constructed of steel and cathodically protected with dielectric material coating; field-installed cathodic protection system designed by corrosion expert; impress-current cathodic protection system and inspected every 60 days; c. Constructed of steel/FRP composite; d. Constructed of steel with no corrosion protection if site determined by corrosion expert to not be corrosive enough to cause release; or e. Alternative design approved by regulatory agency. (40 CFR 280.20(a) and (b))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			4. Spill and Overfill Prevention. If tank system is filled by transfer of more than 25 gallons, it has spill/overfill protection which include: a. Equipment that will prevent release of product when transfer hose is detached from fill pipe (e.g., catchment basin); b. Overfill equipment that: when tank is no more than 95% full shuts off automatically; when tanks is no more than 90% full, it has a high-level alarm; and for tanks with > 4,000 gal capacity, flow is restricted 30 minutes prior to overfilling with high-level alarm 1 minute before overfilling; tank has automatic shut-off flow; or c. Alternative equipment approved by regulatory agency. (40 CFR 280.20(c))	
			5. Proper Installation/Certified Installer. Regulatory agency was notified of installation by ONE of the following certifications: a. Checklist showing that all work in manufacturer's checklist is completed; b. Installer is certified by tank/piping manufacturers or regulatory agency; c. Installation has been inspected and certified by registered PE with experience in UST installation; d. Installation has been approved by regulatory agency; or e. Another method approved by regulatory agency. (40 CFR 280.20(d) and (e)) *Note: State regulations may specifically require one type of certification. Check state regulations.*	
			6. Release Detection. ONE of the following release detections is being used: a. Every 30 days monitoring for release is conducted through automatic tank gauging/inventory control; vapor monitoring; groundwater monitoring; interstitial monitoring; or alternative method approved by regulatory agency; b. Inventory control is conducted on a monthly basis to detect any release of at least 1% of flow-through plus 130 gallons AND tightness testing every 5 years until tank is 10 years old, then tank is monitored every 30 days for releases; OR c. Weekly manual tank gauging is conducted if tank is 550 gallons or less. (40 CFR 280.41(a)) Records are kept documenting compliance with inspection/monitoring/ testing requirements.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			7. Petroleum UST Release Detection for Piping. If project involves installation of an UST which stores petroleum, the UST has release detection in piping which consists of: a. Pressurized piping which is equipped with automatic line leak detector and EITHER tested annually for line tightness OR monitored monthly for releases by vapor/groundwater/interstitial/agency-approved alternative monitoring; or b. Suction piping requirements: below grade piping operates at less than atmospheric pressure and is sloped so that contents of pipe will drain back into tank if suction is released; only 1 check valve is included in each suction line and it is located directly below and as close as practicable to suction pump; and method is provided to check suction requirements. c. No release detection is required if meet suction piping requirements. d. If suction piping requirements are not met, piping must have line tightness test every 3 years OR monitored monthly for releases described for pressurized piping. (40 CFR 280.41(a)) Records are kept documenting compliance with inspection/monitoring/ testing requirements.	
			8. Hazardous Substances USTs/Secondary Containment. Secondary containment is designed/constructed/installed to: a. Contain substances released from tank system until they are detected and removed and prevent release to environment during operational life. b. Containment is checked for releases every 30 days. Records are kept of these inspections. c. Tank and piping designed with double-wall or external liners, including vaults to contain 100% capacity of largest tank. d. Pressurized piping is equipped with automatic line leak detector. (40 CFR 280.42)	
USTs Installed BEFORE December 22, 1988				
			9. Criteria. Project involves the repair/reinstallation or closure of an UST which will meet one of the following standards: 1) UST will meet new tank systems described above; 2) UST will meet upgrading requirements described below; OR 3) UST will be closed. (40 CFR 280.21)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			10. Release Prevention Upgrades. If the UST is a steel tank it has: a. Internal lining which is inspected annually for 10 years/every 5 years thereafter; b. Cathodic protection which is installed and integrity of tank is ensured through internal inspection, monitoring every 30 days (if tank is less than 10 years old) OR tightness testing prior to installation of cathodic protection, and between 3 and 6 months (if tank is less than 10 years old); OR c. Alternative approved by regulatory agency. (40 CFR 280.21(b) and (c)). d. Piping that contains regulated substances and is in contact with ground has been upgraded by installing cathodic protection system described for new tanks (above in question 1), except that no dielectric material coating is required. e. Spill/overfill prevention equipment described for new tanks (above in question 2) has been installed.	
			11. Release Detection. Depending upon when tank was installed, release detection/pressurized piping was installed according to timetable in regulations. Release detection includes ONE of the following. a. Every 30 days monitor release through automatic tank gauging/inventory control, vapor /groundwater /interstitial/ alternative approved monitoring; b. Weekly manual tank gauging (if tank is 550 gallons or less); c. If tank meets upgrade/new tank requirements, on a monthly basis use inventory control to detect release of at least 1% of flow-through plus 130 gallons, tightness testing every 5 years until 10 years old, then monitor every 30 days; OR d. If tank does not meet upgrade/new tank requirements, on a monthly basis conduct inventory control to detect release of at least 1% flow-through plus 130 gallons and tightness test EVERY year. e. If tank contains hazardous substances, secondary containment specified above for new tanks was installed. (40 CFR 280.40). Records of monitoring/inspections/tests are maintained in project files.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			12. Piping Release Detection. Depending upon when tank was installed, release detection for piping has been installed according to timetable in regulations. a. Pressurized piping which is equipped with automatic line leak detector and EITHER tested annually for line tightness OR monitored monthly for releases by vapor /groundwater /interstitial/ agency-approved alternative monitoring; OR b. Suction piping requirements: below grade piping operates at less than atmospheric pressure and is sloped so that contents of pipe will drain back into tank if suction is released; only 1 check valve is included in each suction line and it is located directly below and as close as practicable to suction pump; and method is provided to check suction requirements. c. No release detection is required if meet suction piping requirements. d. If suction piping requirements are not met, piping must have line tightness test every 3 years OR monitored monthly for releases described for pressurized piping. e. Hazardous substance tanks must have secondary containment as described for new tanks. (40 CFR 280.40). Records of monitoring/inspections/tests are kept in files.	
All UST Systems *(Applies to installation, operation, repair, maintenance, etc. of all UST tanks.)*				
			13. Cathodic Protection System Operation/Maintenance. Cathodic protection systems must be tested by qualified tester within 6 months of installation and every 3 years. Impressed current systems are inspected every 60 days. Records of operation of cathodic protection system are maintained in project files. (40 CFR 280.31)	
			14. Repairs. Repairs must prevent releases due to structural failure or corrosion. Proper personnel, specific requirements for metal/FRP piping, and testing after repairs are being complied with. (40 CFR 280.33)	
			15. Compatibility. UST system is compatible with substance stored. (40 CFR 280.32)	
			16. Filling. When UST is being filled, the volume in tank is checked before transfer and transfer operation is constantly monitored to prevent spills/overfills. (40 CFR 280.30(a))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			17. Reporting. Has a spill/overfill occurred at the project site? If so, was the following reported by the client or by TtEC in consultation with the client within 24 hours (*note that states may have more stringent requirements for spill reporting for their UST programs – check state reporting requirements)*: a. Spills/overfill of 25 gallons of petroleum if released to environment. b. Spill of petroleum which causes sheen on surface water. c. Spills of more than RQ of hazardous substance. If not meet these criteria, was spill cleaned up within 24 hours or agency notified that cleanup was not conducted within 24 hours? (40 CFR 280.53)	
			18. Temporarily Out of Service. Maintenance requirements specified in 40 CFR 280.70 must be met for USTs temporarily taken out of service. (40 CFR 280.70)	
			19. Conversion. UST system is being converted to store nonregulated substances. a. The regulatory agency has been/will be notified 30 days prior to conversion. b. Tank is being emptied and cleaned by removing all liquids/accumulated sludges. c. Assessment is being performed to measure for contamination unless other monitoring indicates no release present. d. If release confirmed, notification has been made. (40 CFR 280.71 and .72)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			20. Records. Project files contain the following applicable records *(Mark each applicable record contained in the file.)*: a. Corrosion expert's analysis of site's corrosion potential if corrosion protection is not used on steel tank. b. Proper operation of cathodic protection system -- last 2 inspections for operation of system; last 3 inspections if an impressed current CPS is used. c. Repairs made in compliance with 40 CFR 280.33. d. Performance claims pertaining to any release detection system used and manner in which those claims were tested/justified by manufacturer (5 years from installation). e. Schedules of required calibration/maintenance provided by manufacturer of release detection equipment (5 years from installation). f. Results of tank tightness test (until next test conducted). g. Calibration, maintenance, repairs of release detection equipment (1 year). h. Results of site investigation if permanent closure conducted. i. Copies of permits, notification forms, release reports, corrective action reports, other information submitted to regulatory agency. (40 CFR 280.34(b))	
			21. Reporting. Project files contain the following applicable records *(Mark each applicable record contained in the file.)*: a. Notification for all UST systems (certification of installation). b. Reports of releases, suspected releases, spills/overfills and confirmed releases described in this checklist. c. Corrective action planned or taken -- initial abatement measure, initial site characterization, free product removal, investigation of soil/groundwater cleanup, corrective action plan. d. Notification prior to permanent closure or change in service. (40 CFR 280.34(a))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			Investigation of Release/Corrective Action/Closure	
			22. Suspected Release Reporting. The following was reported to regulatory agency within 24 hours: a. Discovery of released regulated substances at UST site. b. Unusual operating conditions unless equipment is found to be defective but not leaking and is repaired/replaced immediately. c. Monitoring results that indicate release may have occurred, unless monitoring device is defective and it is repaired/replaced and additional monitoring is satisfactory, or second month of inventory control does not confirm initial results. (40 CFR 280.50)	
			23. Investigation. Suspected release is investigated and confirmed within 7 days using tightness testing of tank, piping or both. If environmental contamination is basis of suspected release and UST has passed tank tightness, sampling is conducted in area where release is most likely to have occurred. (40 CFR 280.52)	
			24. Confirmed Release Reporting. Confirmed release has been reported by the client or by TtEC in consultation with the client to regulatory agency within 24 hours. (40 CFR 280.60)	
			25. Corrective Action. Corrective action is being taken to cleanup spill. *Circle which of the following is included in Tetra Tech EC scope of work.* a. Identification/mitigation of fire/explosion/vapor hazards, b. Removal of regulated substance from UST, c. Prevention of further migration of released substance, d. Investigation to determine presence of free product, e. Initial site characterization, f. Free product removal, g. Investigation for soil/groundwater cleanup, h. Development of corrective action plan. (40 CFR 280.60 - .66)	
			26. Closure. The following steps were completed for closure of the UST. (40 CFR 280.71 and .72)	
			a. **Notification.** Regulatory agency was notified 30 days prior to conducting closure. Notice is maintained in files.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			b. **Emptying.** UST was emptied of all product and sludges and cleaned. *Note: Sludges/product may be "hazardous" or "special" waste or "hazardous material" subject to specific management, handling, transportation, disposal, or reuse requirements. Complete applicable checklists to demonstrate compliance with these requirements.*	
			c. **Type of Closure.** UST was closed EITHER through permanent removal of all liquids and accumulated sludges OR by filling with inert material. *Please circle applicable activity.*	
			d. **Site Assessment.** Site assessment was performed to measure for contamination unless vapor or groundwater monitoring detected no release.	
			e. **Notification if Contamination Found.** If contamination was found during assessment, was notification provided to regulatory agency within 24 hours?	
			27. Records. Copies of permits, notification forms, release reports, corrective action reports, other information submitted to regulatory agency is maintained in project files. (40 CFR 280.34(b))	
			28. Reporting. The following reports have been submitted to regulatory agencies: a. Reports of releases, suspected releases, spills/overfills and confirmed releases described in this checklist. b. Corrective action planned or taken -- initial abatement measure, initial site characterization, free product removal, investigation of soil/groundwater cleanup, corrective action plan. c. Notification prior to permanent closure or change in service. (40 CFR 280.34(a))	
Aboveground Storage Tanks (*Applies if project involves the design/construction/repair/cleanup/closure of aboveground storage tanks that store hazardous substance/oil.)*				
			29. Installation/Repair. Design/construction requirements for aboveground storage tanks that store petroleum/hazardous substances are dictated by Uniform Fire Code and state or local oil/hazardous substances regulations. Also, depending upon the size of the tank, an SPCC plan may be required. (UFC, state/local regulations) *Please also complete the "Oil and Hazardous Substances Management" Checklist.*	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			30. Cleanup/Closure. Project involves the cleaning/closure of aboveground storage tanks. ASME standards may apply. Closure of tank will likely be subject to state mini-CERCLA cleanup law if release or suspected release occurred. The state/local law may require that notifications, reports, sampling/analysis plans, QAPP plans, etc. be submitted for review and approval. (ASME, State/local regulations)	
Federal USTs (*This section applies to USTs owned by Federal Agencies and are a result of the Federal Policy Act of 2005*)				
			31. Inspection Requirements. USTs not inspected since December 22, 1998 must be inspected by EPA or State every three years. The first three-year inspection cycle must be completed by August 8, 2010.	
			32. Delivery Prohibition. USTs must meet State eligibility requirements. (Note: Most states have set up tag programs where a green tag means that the UST is eligible to receive a delivery and a red tag means that the UST is ineligible to receive a delivery.)	
			33. Operator Training. States are to have UST operator training requirements developed by August 8, 2009. All UST operators must be trained by August 8, 2012. There are three classes of operators: **Class A:** Personnel having primary responsibility to operate and maintain UST tank systems. **Class B:** Personnel who are responsible for implementing UST state/federal regulatory requirements in the field. **Class C:** Personnel who are responsible for the first line of response events indicating emergency conditions.	
			34. Groundwater Protection. Each new or replaced UST or piping system connected to a new or replaced UST, and new fuel dispenser system, that are located within 1,000 feet of an existing community water system or existing potable drinking water well, must be equipped with secondary containment (including under dispenser containment) and be monitored for leaks. (**Note:** Does not apply to repairs needed to maintain existing UST system.)	

--End of Checklist--

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			This checklist applies when wastewater/stormwater is discharged to surface water, ground, or groundwater, or if any fluids are emplaced in an Underground Injection Well.	
			Surface Wastewater Discharges	
			1. Point Source Discharge. If the discharge constitutes a "point source" discharge into waters of the U.S., an NPDES permit has been obtained. (40 CFR 122.1(b)) *Note: Reference to NPDES permit in this section includes state-authorized NPDES permit.*	
			2. Exemption. Certain point source discharges to waters of the U.S. are exempt from NPDES permitting, for instance, discharges to POTW or privately owned treatment works. See exclusions in 40 CFR 122.3. Project's discharge is exempt from obtaining an NPDES permit.	
			3. § 401 Water Quality Certification. If NPDES program is not delegated to a state and EPA issues the permit, state has issued a Clean Water Act § 401 Certification. Project activities are conducted in compliance with these terms/conditions. (40 CFR 121, State/local regulations)	
			4. Permit Conditions. The permit is valid. The permit terms and conditions have been reviewed and the project is operating in compliance with all terms and conditions of the permit. *Note: For CERCLA activities, for which a "permit" does not need to be obtained, project files contain documentation specifying effluent limits, control technology, monitoring, and if applicable, reporting/recordkeeping requirements. Project is being performed in compliance with these requirements.*	
			a. **Effluent Limits.** Based upon review of discharge monitoring reports (DMR) and permit conditions, verify that permit discharge limits are being met.	
			b. **Bypass/No Effluent Exceedance.** Effluent bypass has occurred which did not cause effluent limitations to be exceeded. Verify that bypass was: essential to maintenance to assure efficient operation; unavoidable to prevent loss of life, personal injury, severe property damage; no feasible alternatives to bypass; exercise of reasonable engineering judgment; or adequate back-up equipment could not have been installed to prevent bypass that occurred during normal periods, equipment downtime, or preventative maintenance. [40 CFR 122.41(m)]	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			c. **Bypass/Effluent Exceedance**. Bypass has occurred and effluent limitations were exceeded. Notification was provided to regulatory agency. - If planned bypass, 10-day prior notice and approval was obtained. - If unanticipated bypass occurred, 24-hour notice was provided. [40 CFR 122.41(m)(3) and (4)]	
			d. **Upset.** Upset occurred and permittee can identify cause for upset. At time of upset project was operating properly, all remedial measures required by agency were complied with. [40 CFR 122.41(n)]	
			e. **Maintenance/Operation.** Project site and treatment/control systems are being properly operated and maintained Project files contain documentation demonstrating compliance. [40 CFR 122.41(e)]	
			5. Treatment Unit. Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable).	
			a. **Training.** Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) *Note: This requirement usually applies to large treatment plants.*	
			b. **Operation/Maintenance Log.** Operation/maintenance logs comply with requirements in state/local regulations and/or permit. Operation logs document when unit is non-operational due to maintenance/equipment failure, etc., or not operable, as well as showing when unit is operating properly.	
			c. **Sludge/Treatment Residue/Filters.** Management and disposal of sludge, treatment residue, and filters are complying with federal/ state solid, hazardous or special waste regulations.	
			d. **Operating/Startup/Shutdown Procedures.** Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)	
			6. Notification/Discharge Limit Exceedances. If NPDES permit limit was exceeded, regulatory agency was notified orally (within 24 hours) and written notification was submitted within 5 days. Notification was also made in monthly monitoring report. [40 CFR 122.41(l)(6) and (7)]	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			7. **Monitoring.** Monitoring requirements specified in NPDES permit and 40 CFR 122, Subpart C are being met. Sampling is being conducted in accordance with 40 CFR 136 unless alternative method has been approved.	
			a. **Recordkeeping.** Adequate documentation is being maintained of sampling date/time/location; analyses dates; individuals performing sampling/analysis; analytical methods/techniques used; and analytical results.	
			b. **DMR.** Monitoring results are reported and submitted on a DMR, and signed by responsible party. [40 CFR 122.41 and 122.22(b)]	
			a. **Notification.** Regulatory agency was notified as soon as project personnel knew or had reason to believe that: b. Activity has occurred or will occur that will result in discharge on a routine or frequent basis of any "toxic pollutant" for which the permit does not establish a limit and it exceeds "notification levels" in 40 CFR 122.44(f). c. - Activity has occurred or will occur that would result in any discharge on a non-routine or infrequent basis of "a toxic pollutant" not limited in the permit, if discharge will exceed "notification levels" specified in 40 CFR 122.44(f).	
			8. **Best Management Plan.** If permit requires a BMP, project site has the plan & implements the requirements. This may be applicable if the project site uses, manufacturers, stores, handles, or discharges any toxic pollutant listed in CWA □307(a)(1) or pollutant listed in CWA □311.	
			9. **Discharge of Toxic Pollutants.** Project discharges aldrin/dieldrin, DDT, endrin, toxaphene, benzidine, or PCBs which have effluent standards or any other toxic pollutant listed in CWA□307(a)(1). a. Specified toxic pollutant effluent limits are being met. b. Regulatory agency has been notified within 60 days from date of promulgation of toxic pollutant standard. c. Reporting is being conducted in compliance with 40 CFR 129.5(d)(2).	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			10. Permit Modification. Regulatory agency has been notified as soon as practicable of any of the following events and the permit has been modified. a. Any significant changes in operation. b. Planned physical alterations/additions to project if it constitutes a "new source" under 40 CFR 122.29(b). c. Alteration/addition could significantly change the nature or increase quantity of pollutants discharged. d. Change affects pollutants that are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [(40 CFR 122.41(l)(1)]	
			11. Permit Transfer. If transfer of NPDES permit to new permittee has occurred, the permit was revoked/reissued/modified, unless former permittee notified regulatory agency at least 30 days prior to transfer, notice described agreement between former/new permittee containing specific date of transfer/coverage/liability, and regulatory agency did not notify former permittee of intention to revoke/reissue/modify permit. (40 CFR 122.61)	
			12. Permit Renewal. Permit will expire within 6 months. An application for NPDES permit was submitted at least 180 days prior to expiration of existing permit. (40 CFR 122.21(a))	
			13. Recordkeeping. The following records are being kept for at least 3 years: a. All data used to complete permit applications and any supplemental information. [40 CFR 122.21(p)] b. Discharge monitoring reports. c. Notification required for routine/non-routine discharge of toxic pollutants not specified in permit under 40 CFR 122.44(f). d. Reports required by the permit. [40 CFR 122.44(i)(2)] e. Equipment calibration/maintenance records/original strip chart recordings for continuous monitoring instrumentation. f. Quality assurance records.	
			14. State-Specific Requirements. Discharge is in compliance with state-specific permit/regulatory requirements. (State regulations)	
Discharge To Publicly Owned Treatment Works/Federally Owned Treatment Works (*Applies when project discharges to POTW/FOTW.*)				
			15. Permit/Approval. Pre-discharge permit/approval has been obtained authorizing the discharge of wastewater to the POTW/FOTW. *Note in adjacent column, if the discharge permit/approval is batch, one-time approval or is sufficient for life of the project. (40 CFR 403.5)*	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			16. Waste Acceptance Criteria. Wastewater complies with the acceptance criteria of the receiving POTW/FOTW. Documentation exists in project files signed by FOTW/POTW that they have reviewed analytical data and wastewater meets their acceptance criteria. *Note: This may be part of permit/approval described above. (40 CFR 403.5)*	
			17. Treatment Unit. Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable). *[40 CFR 122.21(j)(6)(iii)(B)]*	
			a. **Training.** Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) *Note: This requirement usually applies to large treatment plants. (USC 33:26:1341)*	
			b. **Operation/Maintenance Log.** Operation/maintenance logs comply with requirements in state/local regulations and/or permit. Operation logs document when unit is non-operational due to maintenance, equipment failure, etc., or not operating, as well as when unit is operating properly. (40 CFR 403.12)	
			c. **Sludge/Treatment Residue/Filters.** Management and disposal of sludge, treatment residue, and filters are complying with federal/state solid or hazardous or special waste regulations.	
			d. **Operating/Startup/Shutdown Procedures.** Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			18. General Pretreatment Standards. Discharge to POTW complies with general pretreatment standards. [40 CFR 403.5(b)] The following is prohibited from discharge: a. Fire/explosion hazards or waste streams with flashpoint below 140°F. b. Pollutants that will result in toxic gases/vapors/fumes in POTW in quantity to cause acute worker health/safety problems. c. Trucked/hauled pollutants except at discharge points designated by POTW. d. Pollutants that will cause corrosive damage to POTW or pH less than 5.0 unless POTW is designed to handle such discharges. e. Petroleum oil, non-biodegradable cutting oil, oil products of mineral oil origin, or solid or viscous pollutants that will obstruct flow/cause operation interference or pass-through. f. Heat in amounts that will inhibit biological activity or in such quantities that temperature at POTW influent exceeds 104°F unless POTW approves. g. Any pollutant, including oxygen-demanding pollutants, at flow rate or concentration that will cause interference with POTW.	
			19. Categorical Pretreatment Standards. Discharge is subject to categorical pretreatment standards for industrial facilities which specify concentrations of pollutants that may be discharged to POTW, and monitoring, analysis, reporting, and recordkeeping requirements. (40 CFR 403, Appendix C; 40 CFR 403.6 and .12)	
			20. No dilution. Process water or other methods are not used to dilute discharge as partial or complete substitute for treatment to achieve compliance with waste acceptance criteria/pretreatment standards. [40 CFR 403.6(d)]	
			21. No Hazardous Waste. No hazardous waste is discharged to POTW. [Good Management Practice (GMP)]	
			22. Reports/Recordkeeping. Reports/records required under permit/ approval and local/state regulations are being submitted/maintained. Reporting may be required prior to discharge, when upset occurs, etc. Records that may need to be maintained in project files include: copy of permit application, approval/permit, sampling/analysis, treatment unit maintenance/calibration, etc. (State/local regulations/permit)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			23. State/Local-Specific Requirements. Discharge complies with state/local agency permit and regulatory requirements. (State regulations)	
Discharge to Private Treatment Works (*Applies if wastewater is discharged to treatment system owned by a private party.*)				
			24. Contract. A contract has been signed by our client and owner of treatment system allowing discharge of wastewater to private treatment works.	
			25. State Permit. State permit is required to discharge to private treatment works. Project is in compliance with terms/conditions of permit, including discharge limitation, pretreatment requirements, monitoring, inspections, solid waste management plans, spill contingency plans, etc. (State regulations)	
Discharge to Ground/Groundwater				
			26. Permit. State/local agency requires that permit be obtained for the discharge of wastewater to the ground/groundwater. Verify that the project is in compliance with terms and conditions of the permit and regulations. (State/local regulations) *Note: For CERCLA activities for which a "permit" does not need to be obtained, project files contain documentation specifying effluent limits, control technology, monitoring, and if applicable, reporting/ recordkeeping requirements. Project is being conducted in compliance with these requirements.*	
			a. **Effluent Limits.** Based upon review of monitoring reports and permit conditions verify that permit discharge limits are being met.	
			b. **Maintenance/Operation.** Project site and treatment/control systems are being properly operated and maintained. O&M plan has been developed (if required) and is being complied with. Operation logs document when unit is non-operational due to equipment failure, maintenance, etc., not operating, or operating properly.	
			c. **Other Plans.** Permit/regulations require development of other plans (e.g., solid waste management plan, spill contingency plan). These plans have been developed and are being complied with.	
			27. Treatment Unit. Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable):	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			a. **Training.** Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) *Note: This requirement usually applies to large treatment plants.*	
			b. **Operation/Maintenance Log.** Operation/maintenance logs comply with requirements in state/local regulations and/or permit.	
			c. **Sludge/Treatment Residue/Filters.** Management and disposal of sludge, treatment residue, and filters comply with federal/state solid, hazardous, or special waste regulations.	
			d. **Operating/Startup/Shutdown Procedures.** Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)	
			28. Monitoring. Monitoring requirements specified in permit and regulations are being met. (State/local regulations/permit)	
			a. **Recordkeeping.** Adequate documentation is being maintained of sampling date/time/location; analyses dates; individuals performing sampling/analysis; analytical methods/techniques used; and analytical results.	
			b. **Monitoring Reports.** Monitoring results are reported and submitted in a timely fashion.	
			c. **Notification.** Regulatory agency was notified as soon as project personnel knew or had reason to believe exceedance occurred or other permit condition was violated.	
			29. Permit Renewal. Permit will expire within 6 months, and an application for permit has been submitted in a timely fashion. (State/local regulations)	
			30. Reports/Recordkeeping. Reports/records required under permit/ approval and local/state regulations are being submitted/maintained. Reporting may be required prior to discharge, when upset occurs, etc. Records that may need to be maintained in project files include copy of permit application, approval/permit, sampling/analysis, treatment unit maintenance/calibration, etc. (State/local regulations/permit)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Stormwater Discharges				
			31. Applicability. Project activities involve discharge of stormwater and a. Involve construction activities (i.e., clearing, grading, excavation, land disturbing) that impact greater than 5 acres under a common plan [40 CFR 122.26(a)(9)(B) & (b)(15)], OR b. Involve construction activities (i.e., clearing, grading, excavation, land disturbing) that impact equal to or greater than 1 acre; also includes disturbance of less than 1 acre of total land area that is part of a larger common plan that will ultimately disturb more than 1 acre. (does not apply if waiver received – see 122.26(b)(15)(i)(A) & (B)), OR c. Constitute an "industrial activity" (common types of remediation projects that are "industrial" are: landfill closures/construction; RCRA TSDF facilities, etc.). [40 CFR 122.26(b)], OR d. Involve construction activities impacting less than 5 acres at a client's facility which has an existing NPDES stormwater permit. e. Construction activities that result in land disturbances less than 1 acre based on the potential for contribution to a violation of a water quality standard or a significant contribution of pollutants to water of the U.S.A. [122.26(b)(15)(ii)].	
			32. Permit. Coverage under a general permit, individual, group, or multi-sector permit has been obtained. For general/multi-sector permit, NOI was submitted in a timely fashion per federal/state regulations. For individual permits, permit was obtained prior to discharge commencing. *Note: Project may constitute an "industrial activity" at a client's facility which already has an NPDES permit. In such cases, the client has been consulted regarding modifications to individual permit, NOI, and/or Stormwater Pollution Prevention Plan (SWPPP) to include project activities. (40 CFR 122.26)* *Note: For CERCLA activities, although NOI/permit does not need to be obtained, project files must contain documentation showing that "substantive" requirements have been identified and project is in compliance with these requirements. These requirements include effluent limits, BMPs, development of SWPPPs, monitoring, and if applicable reporting/recordkeeping.*	
			33. Permit Conditions. a. **Discharge of Non-Stormwater.** Non-stormwater is not combined with stormwater.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			b. **Release of Reportable Quantity of a Hazardous Substance.** If hazardous substance was released above RQ, NRC/other agencies were notified, SWPPP was modified in accordance with permit terms (normally about 2 weeks), and written notice was provided to regulatory agency within specified timeframe. [40 CFR 122.26(c)(1)(iii)]	
			c. **SWPPP Development.** SWPPP was developed in a timely fashion. State may require submittal of a certification that SWPPP was developed.[40 CFR 122.26(d)(1)(v) & (d)(2)]	
			d. **EPCRA § 313 Sources.** If project is located at a client's facility which is subject to EPCRA § 313 TRI reporting, other permit requirements such as monthly Discharge Monitoring Reports may apply. [Check facility's stormwater permit.)	
			34. Stormwater Pollution Prevention Plan. Under general, individual, or multi-sector permits, SWPPP has been developed which identifies the following. SWPPP has been reviewed and project is in compliance with its terms. [40 CFR 122.26(d)(2)(iv)] a. Pollution prevention team, b. Describes potential pollutant sources, c. Identifies Best Management Practices, d. Housekeeping/preventative maintenance, e. Spill prevention/response procedures, f. Inspections, g. Employee training, h. Recordkeeping/reporting, i. Sediment/erosion control, j. Management of runoff, and k. Comprehensive site evaluation, including schedule.	
			35. Amendment of SWPPP. SWPPP has been amended if there is a change in design, construction, operation, or maintenance at project site which has a significant effect on potential for discharge of pollutants OR if plan has been ineffective.	
			36. Monitoring. Monitoring is being conducted in compliance with permit and SWPPP. (Permit condition/SWPPP)	
			37. Reporting. Reporting to regulatory agency is being conducted in accordance with permit conditions. This may include monitoring results/DMRs, certifications, notifications, etc. (Permit conditions)	
			38. Recordkeeping. Copy of permit/NOI and SWPPP is maintained at project site. Inspection results, monitoring records, correspondence with regulatory agencies, and any other records required to be kept under the permit are maintained in the project files. (Permit conditions)	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			39. State-Specific Requirements. Some states require that Stormwater Management Plan be submitted to state for review and approval for excavation activities, waste pile/stockpile management, etc. If permit is required, verify that project is in compliance with all terms and conditions of permit. (State regulations)	
Discharge to Underground Injection Wells *(Applies if project discharges wastewater to UIC or injection gallery.)*				
			40. Permit/Authorization by Rule. Discharge to injection well has an operating permit or is authorized by rule and the UIC is registered with the regulatory agency. The permit was obtained prior to construction of the well. (40 CFR 144.11, State/local regulations) *Note: Injection well is any dug hole which is deeper than it is wide into which fluids (may include oxygen) are emplaced.*	
			41. Inventory Information. UIC is authorized by rule and an inventory form has been submitted to EPA/state delegated agency. (40 CFR 144.26, State/local regulations)	
			42. Closure Notification. Upon closure of well, UIC inventory form is submitted in a timely fashion (normally within 30 days of closure). Closure complies with EPA/State guidance. If required, agency reviewed/approved cleanup plan. (State/local regulations)	
			43. Authorized by Rule -- Existing Class I, II, or III Wells. Project site discharges to an existing Class I, II, or III well authorized by rule. A plugging/abandonment plan has been developed in accordance with 40 CFR 144.28(c), operating requirements under 40 CFR 144.28(f), monitoring requirements under 40 CFR 144.28(g) are being met, and notification, reporting, and recordkeeping requirements specified in 40 CFR 144.28(b), (h), (j), (k), (l) and (l) are being met. *See definitions for Well Classification in 40 CFR 144.6.*	
			44. Authorized by Rule -- Class IV Well. Project site discharges to or involves the closure of a Class IV well which is authorized to discharge for up to 6 months after UIC program was approved/promulgated. Well is closed/plugged as approved by EPA, and EPA was notified 30 days prior to abandonment (40 CFR 144.23). *Note: 6 month date is 1985. Most projects involving Class IV wells will involve the closure of the well, otherwise a permit must be obtained.*	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			45. Authorized by Rule -- Class V Well. Project involves discharge or closure of a Class V well which is authorized by rule until further requirements under future regulations become applicable. Well authorization expires if EPA requires issuance of permit or upon closure of well. (40 CFR 144.24) *Note: To date, EPA has not issued requirements to permit Class V wells.*	
			46. Permitting. Project site discharges to a permitted well.	
			a. **Permit Acquisition.** Permit has been obtained by the "operator" prior to construction. (40 CFR 144.31)	
			b. **General Permitting Requirements.** General permit requirements are being complied with for operation/maintenance (e.g., operating training, laboratory QA/QC, effective performance, funding, operation backup facilities); monitoring, reporting, recordkeeping and abandonment. (40 CFR 144.51)	
			c. **Class I, II or III Wells.** Mechanical integrity of well has been established and is being maintained. (40 CFR 144.51(q) and 146.8)	
			d. **Well-specific Requirements.** Operation/maintenance, effluent limits, monitoring, and recordkeeping/reporting are in compliance with permit terms and conditions. (40 CFR 144.55)	
			e. **Corrective Action.** If permit contains corrective action requirements, project is in compliance with those conditions. (40 CFR 144.55)	
			47. Class I Nonhazardous Well. Project discharges to a Class I nonhazardous well that meets: a. Criteria and standards for construction specified in 40 CFR 146.12. b. Operating, monitoring, and reporting specified in 40 CFR 146.13.	
			48. Class II Wells. Project discharges to a Class II well that meets: a. Criteria and standards for construction specified in 40 CFR 146.22. b. Operating, monitoring, and reporting specified in 40 CFR 146.23.	
			49. Class III Wells. Project discharges to a Class III well that meets: a. Criteria and standards for construction specified in 40 CFR 146.32. b. Operating, monitoring, and reporting specified in 40 CFR 146.33.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			50. Class I Hazardous Waste Injection Well. Project discharges hazardous waste into a Class I injection well that meets the following criteria: a. Waste is not prohibited from discharge or a waiver has been obtained under 40 CFR 148.1 and 148.10-.17. b. Siting under 40 CFR 146.61. c. Manifesting, notification, identification, maintenance of operating records, reporting, personnel training, certification of closure in accordance with 40 CFR 264 requirements. d. Corrective action requirements, if applicable, under 40 CFR 146.64. e. Construction requirements under 40 CFR 146.65 and .66. f. Operating requirements under 40 CFR 146.67. g. Continuous recording devices for monitoring compliance in accordance with 40 CFR 146.67. h. Testing and monitoring requirements under 40 CFR 146.68. i. Reporting requirements under 40 CFR 146.69. j. Well closure plan/post-well closure plan in accordance with 40 CFR 146.71 and .72. k. Land disposal restrictions in accordance with 40 CFR 148 and 268.	

-- End of Checklist--

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EHS 3-3 ATTACHMENT C
TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS

CONFIDENTIAL

Project:	**Inspector:**	**Date:**

Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**
			This checklist applies to all projects that could potentially impact wetlands, streams, and floodplains.	
			Wetlands (*This section applies if wetlands are* ***suspected to be*** *located adjacent to or within the project site.)*	
			1. Delineation. Wetlands have been delineated by client or Tetra Tech EC, Inc. wetlands biologist. If wetlands are found to be adjacent to or within project site, the wetlands are staked so that project mitigation measures are effective. (E.O. 11990, State/local regulations)	
			a. **Non-Jurisdictional Wetlands.** Jurisdictional status of wetlands has been determined and supporting documentation is in file. *Note: documentation may be in the form of 1) a Jurisdictional Determination from the Army Corps of Engineers or State Agency, or 2) included in as part of an Army Corps of Engineers or State Permit.*	
			2. Buffer. Protective buffers have been identified and area staked so that project mitigation measures are effective. Regulatory agency approved buffers & documentation in file. (State/local regulations)	
			3. CWA § 404 Permit. If a permit was required, project activities are in compliance with the terms/conditions of the permit. (33 CFR 320-330; 40 CFR 230, state/local regulations) *Note: For activities conducted at CERCLA sites, coordination with EPA is required instead of Army Corps of Engineers. Project files were reviewed to verify that sufficient documentation exists to demonstrate that project underwent EPA review for wetlands impact/avoidance/mitigation. In addition, project files document that proper notification was made by EPA/client/Tetra Tech EC to state, USFWS, NMFS, State Fish and Game, SHPO, local agency.*	
			a. **Mitigation.** If mitigation was required, a plan was developed and approved by the regulatory agency. Project activities are being conducted in compliance with the plan.	
			b. **Notification to USFWS, NMFS, State Fish and Game, SHPO, Local Agency.** Notification was made to these agencies and project file contains their documented response to demonstrate that project will not have an adverse impact on threatened/endangered species, cultural resources, and meets local wetlands requirements OR if agencies require mitigation, such measures are being taken.	
			c. **Specific Conditions/Terms.** Terms and conditions of the individual or Nationwide Permit were reviewed and project is in compliance with all terms/conditions.	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			4. Exemption. Certain discharges of dredged or fill material are exempt from permitting. See exemptions in 33 CFR 320. If project activities are exempt from permitting, the EHS Plan or Work Plan contains exemption rationale.	
			5. CWA § 401 Water Quality Certification. § 401 WQC was obtained from state authorizing work in wetlands. Project is in compliance with terms and conditions of that certification. (40 CFR 121, State/local regulations)	
			6. Temporary Water Quality Modification. If project activities will cause the temporary exceedance of water quality criteria (normally due to excavation activities -- turbidity), state/local agency may require that a temporary water quality modification be obtained. If applicable, project activities are complying with the terms and conditions of the approval. (State/local regulations)	
			7. Coastal Zone Management (CZM) Certification. If wetland also located within a coastal zone, CZM Act Certification was obtained from local/state agency. If applicable, project files contain documentation and activities are complying with the terms of the CZMA. (CZMA, State/local regulations)	
Stream Bed/Bank Disturbance (*Applies if project activities involve filling, dredging, altering, or otherwise impacting water quality in or near stream or river.)*				
			8. USACE § 10 or CWA § 404 permit. Project activities involve dredging, filling, or land disturbing activity within "navigable waters" or "waters of the U.S." (normally below "high water mark") of stream/river. USACE § 10/CWA § 404 permit has been obtained. Project is in compliance with terms and conditions of permit. (33 CFR 320-330, 40 CFR 230)	
			9. State Fisheries. Project activities involve dredging, filling, land disturbing activity, or otherwise is impacting water quality within regulated area of stream bed (normally "high water mark"). Permit/approval has been obtained from state fish/game which specifies requirements for the protection of fish. Project is in compliance with terms and conditions of the permit (e.g., erosion control, monitoring, etc.). (State/local regulations)	
			10. Shoreline Protection. Project activities are located within protected shoreline area in the state and constitute a regulated activity. A Shoreline Protection permit has been obtained and project is in compliance with terms and conditions of the permit. (State/local regulations) *Note: If project is located within shoreline but does not constitute a "regulated activity," explain in adjacent column.*	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			11. Temporary Water Quality Modification. If project activities will cause the temporary exceedance of water quality criteria (normally due to excavation activities -- turbidity), state/local agency may require that a temporary water quality modification be obtained. If applicable, project activities are complying with the terms and conditions of the approval. (State/local regulations)	
			12. CWA § 401 Water Quality Certification. If a federal permit/approval was obtained, § 401 WQC was obtained from the state authorizing work in wetlands. Project activities are complying with the terms of the certification. (40 CFR 121, State/local regulations)	
			13. Coastal Zone Management Certification. Project activities are located within a designated coastal zone. CZMA Certification was obtained from local/state agency. Project files contain documentation, and activities are being conducted in compliance with the certification. (CZMA, State/local regulations)	
			14. Riparian Zones. If project activities will cause the removal of near-stream vegetation, activities may require authorization or compliance with State regulations or local ordnances. The riparian zone width depends on the environmental resources being protected. Permit/approval has been obtained, if applicable. Project files contain documentation and activities are in compliance with permit conditions. (State/local regulations)	
Floodplain/Flood Control (*Applies when project will potentially impact floodplains or is located in a flood control area)*				
			15. Floodplain. Project is located within a floodplain as determined through evaluation of FEMA maps or state generated floodplain maps. The project is avoiding/minimizing impacts to floodplains. Measures used to avoid/minimize impacts are documented in project files and have been reviewed/approved by applicable regulatory agency. Permit/approval has been obtained, if applicable. Field activities are in compliance with terms/conditions of permit/approval. (E.O. 11988, State/local regulations)	
			16. Flood Control. Project activities involve excavation or other land disturbing activities in an area which has potential for flood problems. An evaluation has been made of pre- and post-construction flows, and measures to minimize runoff (e.g., stormwater detention/retention) are being implemented.	

--End of Checklist--

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TETRA TECH EC, INC.
PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION FOR DEPARTMENT OF ENERGY PROJECTS

CONFIDENTIAL

Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			This checklist applies to projects where radioactive material and/or types of radiation are present.	
			Determination of License Type	
			1. DOE requires that persons/company conducting work with radioactive material be licensed for specific amounts and types of radioactive material. Is there a license? (DOE)	
			2. Is there a documented Radiation Protection Program (RPP)? (10 CFR 835.101(a))	
			3. Is the RPP content commensurate with the nature of the activities performed and shall include formal plans and measures for applying the ALARA process to occupational exposures? (835.101(c))	
			4. Does the RPP specify the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP? (835.101(d))	
			5. If the RPP was updated, was a revision was submitted to DOE? (835.101(g))	
			Internal Audits (*Applies if a radioactive material license exits.*)	
			1. Are the audits of the Radiation Protection Program every 36 months? (835.102)	
			Radiation Protection Program Management Qualifications (*Applies if a radioactive material license exits.*)	
			1. Do the individuals responsible for developing, implementing, and compliance with the requirements have the appropriate education, training, and skills? (835.103)	
			Procedures (*Applies if a radioactive material license exits.*)	
			1. Are there written procedures developed that are consistent with the ability of the individuals exposed to the hazards? (835.104)	
			Occupational Dose Limits (*Applies if a radioactive material license exits.*)	
			1. Are the annual limits to the occupational workers: a. 5 rem TEDE/yr (835.201(a)(1)) b. 50 rem/yr to internal organs except the eye (835.201(a)(2)) c. 15 rem/yr to the eye (835.201(a)(3)) d. Shallow dose to the skin of 50 rem/yr? (835.201(a)(4))	
			2. Is there a means to authorize a Special Planned Exposure? (835.204)	
			3. Is the dose limit to the fetus/embryo 0.1 rem/9 months? (835.206)	
			4. Is the dose limit to minors 0.1 rem/yr? (835.207)	

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Project:			Inspector:	Date:
Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**
			5. Is the DAC used to calculate internal dose from the inhalation of radioactive material but is this the primary means of determining dose? (835.209)	
Surveys and Monitoring (*Applies if a radioactive material license exits.*)				
			1. Is monitoring performed to demonstrate: a. Detection of buildup of radioactive material (835.401(a)(4) b. Verify effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure (835.401(a)(5) c. Identify and control potential sources of individual exposure to radiation and/or radioactive material? (835.401(a)(6))	
			2. Are the instruments and equipment used for monitoring: a. Periodically maintained and calibrated on an established frequency (835.401(b)(1)) b. Appropriate for he types(s), levels, and energies of the radiation(s) encountered (835.401(b)(2)) c. Appropriate for existing environmental conditions (835.401(b)(3)) d. Routinely tested for operability? (835.401(b)(4))	
			3. Is monitoring of individual exposures to external radiation when radiological workers who, under typical conditions, are likely to receive: a. An effective dose equivalent to the whole body of 0.1 rem or more in a year, or (835.402(a)(1)(i)) b. A shallow dose equivalent to the skin or to any extremity of 5 rem or more in a year, or (835.402(a)(1)(ii)) c. A lens of the eye dose equivalent of 1.5 rem or more in a year? (835.402(a)(1)(iii))	
			4. Are there declared pregnant workers who are likely to receive from external sources a dose equivalent to the embryo/fetus in excess of 10 percent of the limit of 0.5 rem? (835.402(a)(2))	
			5. Are there occupationally exposed minors likely to receive a dose in excess of 50 percent of the limit of 0.1 rem in a year? (835.402(a)(3))	
			6. Are there individuals entering a high or very high radiation area? (835.402(1)(5))	
			7. Is monitoring of airborne radioactivity performed when: a. An individual is likely to receive an exposure of 10 or DAC-hrs in a year (835.403(a)(1)) b. As necessary to characterize the airborne radioactivity hazard where respiratory protective devices have been prescribed? (835.403(a)(2))	

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Project:			Inspector:	Date:
Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**
			8. Is real-time air monitoring is performed as necessary to detect and provide warning of airborne radioactivity concentrations that warrant immediate action to terminate inhalation of the insult? (835.403(b))	
Access Control to Radiological Areas (*Applies if a radioactive material license exits.*)				
			1. Is there a means for personnel entry control using one or more of the following: a. Signs and barricades (835.501(c)(1)) b. Control devices on entrances (835.501(c)(2)) c. Conspicuous visual and/or audible alarms (835.501(c)(3)) d. Locked entrance ways; or (835.501(c)(4)) e. Administrative controls (835.501(c)(5)) f. No control(s) shall be installed at any radiological area exit that would prevent rapid evacuation of personnel under emergency conditions? (835.501(e))	
			2. Are the following measures implemented for each entry in to a high or very high radiation area? a. The area is monitored as necessary during access to determine the exposure rates to which the individuals are exposed (835.502(a)(1)) b. Each individual is monitored by a supplemental dosimetry device or other mans capable of providing an immediate estimate of the individual's integrated deep dose? (835.502(a)(2))	
			3. Are one or more of the following features used for each entrance or access point to a high radiation area: a. A control device that prevents entry to the area when high radiation levels exist or upon entry causes the radiation level to be reduced below that level defining a HRA (835.502(b)(1)) b. A device that functions automatically to prevent use or operation of the radiation source or field while individuals are in the area (835.502(b)(2)) c. A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry (835.502(b)(3)) d. Entryways that are locked. During periods when access to the area is required, positive control over each entry is maintained (835.502(b)(4)) e. Continuous direct or electronic surveillance that is capable of preventing unauthorized entry (835.502(b)(5)) f. A control device that will automatically generate audible and visual alarm signals to alert personnel I the area before use or operation of the radiation source and in sufficient time to permit evacuation of the area or activation of a secondary control device that will prevent use or operation of the source? (835.502(b)(6))	

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Project:				Inspector:	Date:
Yes	No	N/A	**REQUIREMENTS**		**COMMENTS/NOTES**
			4. In addition to the above requirements, are additional measures implemented to ensure individuals are not able to gain unauthorized or inadvertent access to very high radiation areas? (835.502(c))		
Posting and Labeling (*Applies if a radioactive material license exits.*)					
			1. Are the postings and labels include the standard radiation warning trefoil in black or magenta imposed upon a yellow background? (835.601(a))		
			2. Are the access points to a controlled area posed whenever radiological areas or radioactive material areas exist where the total effective dose equivalent is not more than 0.1 rem in a year? (835.602(a))		
			3. Is each access point to radiological areas and radioactive material areas posted with signs bearing the following wording: a. Radiation area (835.603(a)) b. High radiation area (835.603(b)) c. Very high radiation area (835.603(c)) d. Airborne radioactivity area (835.603(d)) e. Contamination area (835.603(e)) f. High contamination area (835.603(f)) g. Radioactive material area? (835.603(g))		
			4. Are areas excepted from the posting requirements for periods of less than8 continuous hours when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures? (835.604(a))		
Respiratory Protection and Controls to Restrict Internal Exposures (*Applies if a radioactive material license exits.*)					
			1. Is there air monitoring as necessary to characterize the airborne radioactivity hazard where respiratory protective devices for protection against airborne radionuclides have been prescribed? (835.403(a)(2))		
Radiological Records (*Applies if a radioactive material license exits.*)					
			1. Are there records documenting doses received by all individuals for whom monitoring was required? (835.702(a))		
			2. Are the results of individual external and internal dose monitoring that is performed, but not required, recorded? (835.702(b))		

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Project:			Inspector:	Date:
Yes	No	N/A	**REQUIREMENTS**	**COMMENTS/NOTES**
			3. Are the following results of monitoring for radiation and radioactive material documented: a. Results from monitoring entries into high and very high radiation areas and contamination and high contamination areas; (835.703(a)) b. Results of monitoring used to determine individual occupational dose from external and internal sources; (835.703(b)) c. Results of monitoring for the release and control of material and equipment; and (835.703(c)) d. Results of maintenance and calibration performed on survey and monitoring instruments and equipment? (835.703(d))	
			4. Are training records maintained to show: a. Radiation safety training (835.704(a)) b. Actions taken to maintain occupational exposure ALARA (835.704(b)) c. Documentation of the results of internal audits and other reviews of program content and implementation (835.704(c)) d. Written declarations of pregnancy (835.704(d)) e. Changes in equipment, techniques, and procedure used for monitoring (835.704(e)) f. As necessary to demonstrate compliance with the requirements for sealed radioactive source control, inventory, and source leak tests? (835.704(f))	
Reports to Individuals and Licensor (*Applies if a radioactive material license exits.*)				
			1. Is a report to individuals concerning their radiation exposure being reported when: a. Is reported in writing and includes the DOE site or facility name, the individuals name, SS number, employee number, or other unique identification number (835.801(a)) b. Upon request of the individual terminating employment (835.801(b)) c. Annually (835.801(c)) d. Upon request (835.801(d)) e. When a DOE contractor is required to report to the DOE for occurrence reporting and processing? (835.801(e))	
Sealed Radioactive Source Control (*Applies if a radioactive material license exits.*)				
			1. Is there a program for control of sealed radioactive sources that are used, handled, and stored? (835.1201)	
			2. Is each accountable sealed source inventoried at intervals not to exceed six months and the inventory contains: a. Physical location of each accountable sealed radioactive source (835.1302(a)(1)) b. Verify the presence and adequacy of associated postings and labels(835.1302(a)(2)) c. Establish the adequacy of storage locations, containers, and devices? (835.1302(a)(3))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
Radiological Criteria for License Termination (*Applies if a radioactive material license exits.*)				
Radiation Safety Training or Instruction to Workers (*Applies if a radioactive material license exits.*)				
			1. Does each individual complete radiation safety training on the topics in 835.901(c) commensurate with the hazards in the areas and the required controls? (835.901(a))	
			2. Is this training completed before being permitted unescorted access and before receiving occupational dose? (835.901(b)(1-2))	
			3. Does each individual demonstrate knowledge of the radiation safety training topics in 835.901(c) commensurate with the hazards in the area and required controls, by successful completion of an examination and performance demonstration? (835.901(b)	
			4. Does the Radiation safety training include the following topics, to the extent appropriate to each individual's prior training, work assignments, and degree of exposure to potential radiological hazards: a. Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure; (835.901(c)(1)) b. Basic radiological fundamentals and radiation protection concepts; (835.901(c)(2)) c. Physical design features, administrative controls, limits, policies, procedures, alarms, and other measures implemented at the facility to manage doses and maintain doses ALARA, including both routine and emergency actions; (835.901(c)(3)) d. Individual rights and responsibilities as related to implementation of the facility radiation protection program; (835.901(c)(4)) e. Individual responsibilities for implementing ALARA measures required by 835.101, and; (835.901(c)(5)) f. Individual exposure reports that may be requested? (835.901(c)(6))	
Design and Control (*Applies if a radioactive material license exits.*)				
			1. Are measures taken to maintain radiation exposure in controlled areas ALARA through physical design features and administrative control as as supplementary method? (835.1001(a))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			2. During the design of new facilities or modification of existing facilities, are the following objectives adopted: a. Optimization methods are used to assure that occupational exposure is maintained ALARA in developing and justifying facility design and physical controls (835.1002(a)) b. The design objective for controlling personnel exposure from external sources of radiation in areas of continuous occupational occupancy are maintained at exposure levels below an average of 0.5 mrem per hour and far below this average as possible (835.1002(b)) c. The design objective for the control of airborne radioactive material is under normal conditions, to avoid releases to the workplace atmosphere and in any situation to ALARA levels; confinement and ventilation is normally used; (835.1002(c)) d. The design or modification and the selection of materials includes features that facilitate operations, maintenance, decontamination, and decommissioning? (835.1002(d))	
			3. Does the licensee, during routine operations, use the combination of physical design features and administrative control provided that: a. The anticipated occupational dose to general employees does not exceed 835.202 limits, and (835.1003(a)) b. The ALARA process is utilized for personnel exposure to ionizing radiation? (835.1003(b))	
Radioactive Contamination Control (*Applies if a radioactive material license exits.*)				
			1. Are there means to release material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas to a controlled area, if: a. Removable surface contamination levels on accessible surfaces exceed the removable surface contamination levels specified; (835.1101(a)(1)) b. Prior use suggests that the removable surface contamination levels on inaccessible surfaces are likely to exceed the removable contamination levels specified? (835.1101(a)(2))	
			2. Is there a means for material and equipment exceeding the removable surface contamination values specified, to be conditionally release for movement on-site from one radiological area for immediate placement in another radiological area only if appropriate monitoring is performed and appropriate controls for the movement are established and exercised? (835.1101(b))	

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Project:	Inspector:	Date:

Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			3. Is there a means for material and equipment with fixed contamination levels that exceed the total contamination values specified, to be released for use in controlled areas outside of radiological areas only under the following conditions: a. Removable surface contamination levels are below the removable surface contamination values specified; and (835.11019(c)(1)) b. The material or equipment is routinely monitored and clearly marked or labeled to alert personnel of the contamination status? (835.1101(c)(2))	
			4. Does the licensee maintain and verify appropriate controls which prevent the inadvertent transfer of removable contamination to locations outside of radiological areas under normal operating conditions? (835.1102(a))	
			5. Are areas accessible to individuals where the measured total surface contamination levels are less than, corresponding surface contamination values specified, controlled as follows when located outside of radiological areas: a. The area is routinely monitored; (835.1102(c)(1)) b. The area is conspicuously marked to warn individuals of the contaminated status? (835.1102(c)(2))	
			6. Are individuals exiting contamination, high contamination, or airborne radioactivity areas be monitored, as appropriate, for surface contamination? (835.1102(d))	
			7. Do individuals entering areas in which removable contamination exists at levels exceeding the removable surface contamination values specified, wear protective clothing? (835.1102(e))	

-- End of Checklist --

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APPENDIX D

FIELD INSPECTION FORMS

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ATTACHMENT B
TETRA TECH EC, INC.
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
Weather Conditions at time of Inspection _____.		
Work Conditions		
1. Housekeeping		
2. Walking/Working Surfaces		
3. Aisles and Passageways		
4. Platforms/Scaffolding		
5. Ladders		
6. Stairs, Guardrails, Toe-boards		
7. Exits/Egress		
8. Roadways		
9. Ventilation i think this can go away since I don't know what it refers to.		
10. Lighting		
11. Noise Exposure		
12. Ergonomics (EHS 3-1, Attachment B)		
13. Site Perimeter and Control Zones Identified		
Equipment		
14. Hand/Portable Tool Condition, Storage and Use		
15. Machine, Conditions/Guarding		
16. Mobile/Heavy Equipment a. Physical inspection of equipment b. Review of daily inspection reports c. Review of equipment deficiency corrections logs/records		
Material Handling Equipment		
17. Hoisting and Rigging		
18. Lifting Aids Used When Possible		
19. Proper Lifting Techniques Used		
Electrical Safety		
20. Power Cords		
21. GFCI		
22. Generators		
23. Breaker Box Access/Clearance		
Hazardous Materials		
24. Hazardous Chemical List Current		
25. MSDS		

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ATTACHMENT B
TETRA TECH EC, INC.
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
26. Labeling		
27. Signs/Postings/Color Coding		
28. Proper Storage and Segregation of Hazardous Materials		
29. Compressed Gas Storage and Use		
Emergency Systems		
30. Emergency phone numbers posted		
31. Evacuation routes, rally points shown on site map		
32. Fire extinguishers inspected monthly		
33. Eyewashes and showers periodically inspected, units flushed, and fluids periodically changed		
34. First Aid Kits/Stations		
35. Emergency Rescue Equipment		
Protective Equipment		
36. PPE used, stored, and maintained in accordance with EHS plan		
37. Respirator use, storage, and maintenance		
Hazardous Waste Storage Area (HWSA)/Satellite Accumulation Area (SAA)		
38. If HWSA are present, they are being inspected and documented weekly.		
39. Findings are being corrected.		
40. Wastes stored in designated, secured area with “Hazardous Waste” signage. For SAA, area is marked “SAA”. SAA located at the point of generation.		
41. Containers of hazardous waste marked with the words “hazardous waste”		
42. Wastes accumulated onsite are within allowed time limits (e.g., < 90 days for large quantity generators) - check accumulation start dates on containers in HWSA and compare to tracking log.		
43. Waste in SAA limited to max of 55 gallons and when full, moved to HWSA within 3 days.		
44. Hazardous Waste Container Standards:		

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ATTACHMENT B
TETRA TECH EC, INC.
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
i. DOT-spec. containers (for wastes to go off-site only)		
ii. Intact/in good condition		
iii. Waste compatible with containers (e.g., no evidence of corrosion, softening, bulging)		
iv. Securely closed and stored to prevent rupture/leaking, except when add/remove waste.		
45. Reactive/ignitable wastes stored at least fifty (50) feet from property.		
46. Liquid wastes within secondary containment (BMP, check WMP to determine state requirements).		
47. Incompatible wastes separated by a dike, wall, berm or other device.		
48. In HWSA, containers are separated by minimum 36 inch aisle space. Labels and markings are visible and legible on all containers.		
Hazardous Waste Tank Storage Area		
49. Daily written inspection is being conducted and is maintained on site. The inspection requirements in the plan are being documented as required.		
Waste/Stockpiles		
50. Refer to: 1. Attachment C – Hazardous Waste Less Than 90 Days For Hazardous Waste Stockpiles; 2. Attachment C – Solid Waste For State Regulated/Non-Hazardous Stockpiles; and/or 3. Attachment C – PCB for PCB Stockpiles		
TSCA PCB Wastes		
51. Inspected every 30 days at a minimum. Refer to Attachment C - PCB Checklist for < 30 day or less than 1 year storage area requirements and general PCB container storage requirements		

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ATTACHMENT B
TETRA TECH EC, INC.
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
Spill Prevention and Preparedness		
52. Outside of containers or tanks (as applicable) show no signs of deterioration, leaks, or discharges at seams, gaskets, piping, pumps, valves, rivets, or bolts.		
53. Appropriate containment materials are available and accessible, which may include: drip pans, dikes, berms, retaining walls, curbing, other barriers, spill diversion ponds, retention ponds, or integrated secondary containment structures.		
54. Spill control and response materials are available, which may include: designated spill response kits, drip pans, sorbent materials, oil retention booms (floating or sorbent), sand bags/temporary curbing devices, fuel recovery pumps/collection hoses, fuel recovery tank trucks, and tools.		
55. Is there any evidence of a sheen or discoloration on the ground? Are hazardous materials stored properly in a manner that minimizes potential for spills?		
56. Emergency Contact Lists are current and posted.		
57. People have received training.		
58. Does the project have a Spill Response, Control, and Countermeasures (SPCC) Plan? If yes, are inspections being performed and documented as required in the plan? Has the plan been updated as required?		
Stormwater Pollution Prevention and Erosion Controls		
59. Are site activities causing land disturbance being performed (grading, excavating, clearing and grubbing, demolition and foundation removal, etc?		

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ATTACHMENT B
TETRA TECH EC, INC.
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
58. Are there surface waters present on or adjacent to the site that could be impacted by runoff from the site? Is there any evidence of runoff from the project site to these areas?		
59. Are there storm drains, catch basins or other conveyances that collect stormwater? Are there activities occurring that could cause oil, contaminants, or sediments to enter these conveyances? If yes, are there measures in place or needed to protect stormwater quality?		
60. Are there signs of erosion on recently disturbed soils (channelization, rivulets, siltation runoff, etc.)? Can the erosion lead to sediment or runoff to surface water or conveyances? If yes, are erosion control BMPs necessary or recommended?		
61. Are BMPs being implemented per the environmental project plans? For instance, preventative maintenance, good housekeeping practices, proper waste storage and storage of hazardous materials, etc.?		
62. Does the project have a total land disturbance = or > 1 acre or is the project part of a larger or common plan of development that could exceed an acre of disturbance?		
63. Does the project have a Stormwater Pollution Prevention Plan (SWPPP)? If yes, are inspections being performed and documented as required in the plan?		
64. Fugitive Dust – Appropriate BMPs are instituted for fugitive dust emissions.		
Other Conditions or Work Practices		
65.		
66.		
67.		
68.		

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ATTACHMENT B
TETRA TECH EC, INC.
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Project/Location:	**Inspector/s:**		**Time/Date:**
ACTION ITEM	**RESPONSIBLE PARTY**	**SCHEDULE**	**DATE COMPLETED**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Reviewed by: _____ _____
Site Superintendent/ Site Manager Date

cc: Project Manager (monthly only)
PESM (monthly only)

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TETRA TECH EC, INC.

DAILY EQUIPMENT INSPECTION

PROJECT_____

MANUFACTURER TYPE _____

UNIT #_____MODEL _____ DATE _____

ENGINE HRS/MILEAGE _____ /_____ SHIFT _____

Check appropriate column and describe correction needed.

	If Good (✔)	NA	Correction Needed
Steering Mechanisms[1] *	_____	_____	_____
Service Brakes [2]	_____	_____	_____
Emergency Brakes[1]			
Parking Brake[1]	_____	_____	_____
Transmission & Controls	_____	_____	_____
Suspension & Springs	_____	_____	_____
Hydraulic Leaks	_____	_____	_____
Exhaust System	_____	_____	_____
Warning Gauges	_____	_____	_____
Windshield[1] & Wipers	_____	_____	_____
Lights (Head & Tail)	_____	_____	_____
Brake Lights[1]	_____	_____	_____
Mirrors	_____	_____	_____
Seat and Seat Belts[1] (w/ ROPS)	_____	_____	_____
Tires/Tread[1]	_____	_____	_____
Regular Horn	_____	_____	_____
Audible Back-up Alarm[1]	_____	_____	_____
Steps, Hand-holds	_____	_____	_____
Fire Extinguisher	_____	_____	_____
Engine Coolant	_____	_____	_____
Engine Oil	_____	_____	_____
Hydraulics & Operating Controls	_____	_____	_____
Fenders/Mudflaps	_____	_____	_____
Heater/defroster	_____	_____	_____
All items in cab or bed secured	_____	_____	_____
Cleanliness inside and outside	_____	_____	_____

Remarks:

[1] Items required to be operational by OSHA 1926.602 before use.

[2] Service brake must be capable of stopping and holding equipment fully loaded. _____

_____ _____

Operator Name (Printed) Operator Signature

Review : Superintendent _____

Date Repairs or adjustments completed:_____

Equipment Supervisor/Mechanic:_____

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APPENDIX E

CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR)

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☐ Initial Report
☐ Follow-up Report
☐ Final Report

Contractor Significant Incident Report (CSIR)

1. General Information

Contracting Activity/ROICC Office:

Accident Classification:

☐ Injury ☐ Fatality ☐ Environment ☐ Procedural Issues ☐ Lessons Learned
☐ Illness ☐ Property Damage ☐ Other_____

Involving:

☐ Confined Space ☐ Equip/Mrt Ver/Mat Handling (Heavy Construction Equip.) ☐ Hazardous Material
☐ Crane and Rigging ☐ Equip/Mrt Ver/Mat Handling (Material Handling) ☐ Trenching/Excavation
☐ Diving ☐ Equip/Mrt Ver/Mat Handling (Man-Lift/Elevated Platform) ☐ Waterfront/Marine Operations
☐ Demolition/Renovation ☐ Fall from Ladder ☐ Fall from Scaffold ☐ Other_____
☐ Electrical ☐ Fall from Roof ☐ Fire

2. Personal Information

Name (Last, First, MI):	**Age:**	**Sex:**

Job Title/Description:	**Employed By:**
Supervisor Name (Last, First, MI) & Title:	**Was the person trained to perform this activity/task?** ☐ **Yes** ☐ **No**
What type of training was received (OJT, classroom, etc)?	**Date of the most recent formal training and topics discussed?**

3. Witness Information

Witness #1: Name (Last, First, MI):	**Job Title/Description:**
Employed By:	**Supervisor Name (Last, First, MI):**
Witness #2: Name (Last, First, MI):	**Job Title/Description:**
Employed By:	**Supervisor Name (Last, First, MI):**

Additional Witnesses: ☐ **Yes** ☐ **No**
(List any additional witnesses on a separate sheet and attach.)

4. Contract Information

Type of Contract:

☐ A/E ☐ BOS ☐ CLEAN ☐ Construction ☐ Design Build ☐ FSCC ☐ FSSC

☐ JOC ☐ RAC ☐ Service ☐ Other_____

Contract Number & Title:	**Industrial Group & Industrial Type:**
Prime Contractor Name/Address/Phone & Fax No: **Safety Manager (Last, First, MI):** **Insurance Carrier:**	**Sub Contractor Name/Address/Phone & FAX No:** **Safety Manager (Last, First, MI):** **Insurance Carrier:**

5. Accident Description

Date of Accident:	**Time of Accident:**	**Exact Location of Accident:**

Describe the accident in detail in your words: ***(Use the back of page if you need additional space)***

Direct Cause(s) of Accident:

Indirect Cause(s) of Accident:	
Action(s) taken to prevent re-occurrence or provide on-going corrective actions:	
Corrective Action Beginning Date:	**Anticipated Completion Date:**
Personal Protective Equipment: ☐ Available and used ☐ Available and not used ☐ Not Required ☐ Not related to Mishap ☐ Wrong PPE for job ***List PPE Used:***	
Type of Construction Equipment (Make, Model, Serial #, VIN#) Involved:	
Was Hazardous Material Spilled/Released? ☐ **Yes** ☐ **No** ***Please List Hazardous Material(s) Involved:***	
Who provided first aid or cleanup of mishap site?	
Any blood-borne pathogen exposure, other than EMTs? ☐ **Yes** ☐ **No** ***Who?***	
List OSHA and EM-385-1-1 standards that were violated:	
Was site secured and witness statements taken immediately? ☐ **Yes** ☐ **No** ***By Whom?***	

6. Injury Illness/Fatality Information

Severity of Injury/Illness:

- ☐ Fatality
- ☐ Lost Workday Case Involving Days Away From Work
- ☐ Temporary Disabillity
- ☐ Recordable Workday Case Involving Restricted Duty
- ☐ Permanent Total Disability
- ☐ Other Recordable Case
- ☐ Recordable First Aid Case
- ☐ Permanent Partial Disability
- ☐ Non-Recordable Case
- ☐ No Injury

Estimated Days Lost:	**Estimated Days Hospitalized:**	**Estimated Days Restricted Duty:**

List Primary Body Part Affected:	**List Other Body Part(s) Affected:**

Nature of Injury/Illness for Primary Body Part (Examples: Amputation, Burn, Hernia):

Type of Accident (Examples: Fall same level, Lifting, Bitten, Exerted):

Source of Accident (Examples: Crane, Carbon Monoxide, Ladder, Welding Equipment):

7. Causal Factors *(Explain answers on supplementary sheet)*

• **Design – Design of facility, workplace, or equipment was a factor?**	☐ **Yes** ☐ **No**
• **Inspection/Maintenance – Inspection & Maintenance procedures were a factor?**	☐ **Yes** ☐ **No**
• **Persons Physical Condition – In your opinion, the physical condition of the person was a factor?**	☐ **Yes** ☐ **No**
• **Operation Procedures – Operating procedures were a factor?**	☐ **Yes** ☐ **No**
• **Job Practices – One or more job safety/health practices not being followed when the accident occurred contributed to the accident?**	☐ **Yes** ☐ **No**
• **Human Factors – One or more human factors, such as a person's size or strength contributed to the accident?**	☐ **Yes** ☐ **No**
• **Environmental Factors – Heat, cold, dust, sun, glare, etc., contributed to the accident?**	☐ **Yes** ☐ **No**
• **Chemical and Physical Agent Factors – Exposure to chemical agents, such as dust, fumes, mist, vapors, or physical agents such as noise, radiation, etc., contributed to the accident?**	☐ **Yes** ☐ **No**
• **Office Factors – Office setting such as lifting office furniture, carrying, stooping, contributed to the accident?**	☐ **Yes** ☐ **No**
• **Support Factors – Inappropriate tools/resources were provided to perform the task?**	☐ **Yes** ☐ **No**
• **PPE – Improper selection, use or maintenance of PPE contributed to the accident?**	☐ **Yes** ☐ **No**
• **Drugs/Alcohol – In your opinion, were drugs or alcohol a factor?**	☐ **Yes** ☐ **No**
• **Job Hazard Analysis – The lack of an adequate (IAW-EM-385-1-1 Sec 01.A) activity hazard analysis was a contributing factor.**	☐ **Yes** ☐ **No**
• **Job Hazard Analysis – JHA was not site specific and/or did not address the type of work/operations performed when the mishap occurred.**	☐ **Yes** ☐ **No**
• **Management – A lack of adequate supervision contributed to the accident.**	☐ **Yes** ☐ **No**
• **Management – Inadequate information was provided at pre con meeting.**	☐ **Yes** ☐ **No**

8. OSHA Information			
Date OSHA was Notified:	**Date(s) of Investigation:**	**Date of citation:** ***(Attach Copy)***	**Dollar amount of Penalties:**

9. Report Preparer	
Name (Last, First, MI):	**Date of Report:**
Title: **Employer:** **Phone #:**	**Signature:**

CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR) INSTRUCTIONS
Complete Sections Appropriate to Incident (Rev. 06/02).

NOTE: THE ATTACHED CSIR FORM IS TO BE USED BY CONTRACTORS TO RECORD THE RESULTS OF THEIR ACCIDENT/INCIDENTS INVESTIGATIONS AND SHALL BE PROVIDED TO THE CONTRACTING OFFICER WITHIN THE REQUIRED TIMEFRAMES.

GENERAL. Complete a separate report for each person who was injured in the accident. A report needs to be completed for all OSHA recordable accidents, property damage in excess of $2000.00 (This amount is for record purposes only. GOV is not required to enter property damage reports into FAIR database if it is less than $10,000.00.), WHE accidents, or near miss/high visibility mishaps. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es), non-applicable sections shall be marked "N/A". If additional space is needed, provide the information on a separate sheet of paper and attach to the completed form.

Mark the report:
INITIAL – If this form is being used as initial notification of a Fatality or High Visibility Mishap. The initial form is due within 4 hours of a serious accident. A form marked 'Follow-up' or 'Final' is required within 5 days.
FOLLOW-UP – If you are providing additional information on a report previously submitted.
FINAL – If you are providing a completed report and expect no changes.

SECTION 1 – GENERAL INFORMATION

CONTRACTING ACTIVITY/ROICC OFFICE - Enter the name and address of the Contracting Office administering the contract under which the mishap took place (e.g. ROICC MCBH, ROICC NORFOLK, PWC GUAM, etc.).

ACCIDENT CLASSIFICATION - INJURY/ILLNESS/FATALITY/PROPERTY DAMAGE/-PROCEDURAL ISSUES/-ENVIRONMENTAL/LESSONS LEARNED/OTHER – Mark the appropriate block(s) if the incident resulted in any of these conditions.

INVOLVING - If the mishap involved any of the conditions listed under "Involving" mark the appropriate box(es). Specific questions associated with each of these conditions are available from the Contracting Officer to assist you in your investigation. When these questions are used they shall be attached as part of this report.

SECTION 2 - PERSONAL INFORMATION

NAME - Enter last name, first name, middle initial of person involved.
AGE - Enter age.
SEX - Enter M for Male and F for Female.
JOB TITLE/DESCRIPTION - Enter the job title/description assigned to the injured person (e.g. carpenter, laborer, surveyor, etc.).
EMPLOYED BY - Enter employment company name of the person involved.
SUPERVISOR'S NAME & TITLE - Enter name and title of the immediate supervisor.
WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? - For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.
TYPE OF TRAINING - Indicate the specific type of training (classroom or on-the-job) that the injured person received before the accident happened.
DATE OF MOST RECENT FORMAL TRAINING/TOPICS DISCUSSED - Enter the month, day, and year of the last *formal* training completed that covered the activity/task being performed at the time of the accident. List topics that were discussed at the training identified above.

SECTION 3 - WITNESS INFORMATION

The following applies to Witness #1 and Witness #2:
WITNESS NAME - Enter last name, first name, middle initial of the witness.
JOB DESCRIPTION/TITLE - Enter the job title/description assigned to the witness (e.g. carpenter, laborer, surveyor, etc.).
EMPLOYED BY - Enter the name of the employment company of the witness.
SUPERVISORS NAME - Enter name of immediate supervisor of the witness.
ADDITIONAL WITNESSES - Provide same information, as above, for each witnesses. Use additional pages if necessary.

SECTION 4 - CONTRACTOR INFORMATION

TYPE OF CONTRACT - Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.
CONTRACT NUMBER/TITLE - Enter complete contract number and tile of prime contract (e.g. N62477-85-C-0100, 184 Pearl City Hsg. Revitalization).
CONSTRUCTION INDUSTRIAL GROUP AND INDUSTRIAL TYPE – This is the type of construction that will be done at this project.

1. First, you must choose the Industrial Group. You have 4 choices to choose from: (**NOTE**! Review of the Industrial Types below and knowing what the projects scope of work is will assist you in deciding what the Industrial Group should be.)

a. Buildings
b. Heavy Industrial
c. Infrastructure
d. Light Industrial

2. Once you have chosen the Industrial Group, you now select the Industrial Type. You have multiple choices under each Group, chose the one you feel fits the project most closely because on most projects there won't be an exact match:

a. Buildings:
   (1) Communications Ctr.
   (2) Dormitory/Hotel
   (3) High-rise Office
   (4) Hospital
   (5) Housing
   (6) Laboratory
   (7) Low-rise Office
   (8) Maintenance Facility
   (9) Parking Garage
   (10) Physical Fitness Ctr.
   (11) Restaurant/Nightclub
   (12) School
   (13) Warehouse
b. Heavy Industrial:
   (1) Chemical Mfg.
   (2) Electrical (Generating)
   (3) Environmental
   (4) Metals Refining/Processing
   (5) Mining
   (6) Natural Gas Processing
   (7) Oil Exploration/Production
   (8) Oil Refining
   (9) Pulp and Paper
c. Infrastructure:
   (1) Airport
   (2) Electrical Distribution
   (3) Flood Control
   (4) Highway
   (5) Marine Facilities
   (6) Navigation
   (7) Rail
   (8) Tunneling
   (9) Water/Wastewater
d. Light Industrial:
   (1) Automotive Assembly/Mfg.
   (2) Consumer Products Mfg.
   (3) Foods
   (4) Microelectronics Mfg.
   (5) Office Products Mfg.
   (6) Pharmaceuticals Mfg.

CONTRACTOR'S NAME/ADDRESS/PHONE NUMBER

(1) PRIME - Enter the exact name (title of firm), address, phone and fax numbers of the prime contractor.
(2) SUBCONTRACTOR - Enter the exact name, address, phone and fax numbers of any subcontractor involved in the accident.

SAFETY MANAGER'S NAME

(1) PRIME - Enter the name of the prime contractor safety manager.
(2) SUBCONTRACTOR - Enter the name of the subcontractors safety manager.

INSURANCE CARRIER

(1) PRIME - Enter the exact name/title of the prime's insurance company. Policy number not required.
(2) SUBCONTRACTOR - Enter the exact name of the subcontractor's insurance company. Policy number not required.

SECTION 5 - ACCIDENT DESCRIPTION

DATE OF ACCIDENT - Enter the month, day, and year of accident.
TIME OF ACCIDENT - Enter the local time of accident in military time. Example: 14:30 hrs (not 2:30 p.m.).
EXACT LOCATION OF ACCIDENT - Enter facts needed to locate the accident scene (installation/project name, building/room number, street, direction and distance from closest landmark, etc.).
DESCRIBE THE ACCIDENT IN DETAIL. Fully describe the accident in the space provided. If property damage involved, give estimated dollar amount of damage and/or repair costs involved. If additional space is needed continue on a separate sheet and attach to this report. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Ensure questions below regarding direct cause(s), indirect cause(s), and actions taken are answered. **NOTE!** Review questions in Section 7 below before completing.
DIRECT CAUSE(S) - The direct cause is that single factor which most directly lead to the accident. See examples below.
INDIRECT CAUSE(S) - Indirect cause are those factors, which contributed to, but did not directly initiate the occurrence of the accident.

Examples for Direct and Indirect Cause:
1. Employee was dismantling scaffold and fell 12 feet from unguarded opening.
Direct cause: Failure to provide fall protection at elevation

Indirect causes: Failure to enforce safety requirements: improper training/motivation of employee (possibility that employee was not knowledgeable of fall protection requirements or was lax in his attitude toward safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.

2. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by contractor vehicle. (note contractor vehicles was in proper safe working condition.)
Direct cause: Failure of contractor driver to maintain control of and stop contractor vehicle within safe distance.
Indirect cause: Failure of employee to pay attention to driving (defensive driving).

ACTION(S) TAKEN TO PREVENT RE-OCCURRENCE OR PROVIDE ON-GOING CORRECTIVE ACTIONS. Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on back or additional sheets of paper if necessary to fully explain and attach to the complete report form.
CORRECTIVE ACTION DATES -
(1) Beginning - Enter the date when the corrective action(s) identified above will begin.
(2) Anticipated Completion - Enter the date when the corrective action(s) identified above will be completed.
PERSONAL PROTECTIVE EQUIPMENT (PPE) - Mark appropriate box(es) and list PPE which was being used by the injured person at the time of the accident (e.g. protective clothing, shoes, glasses, goggles, respirator, safety belt, harness, etc.)
TYPE OF CONTRACTOR EQUIPMENT - Enter the Serial Number, Model Number and specific type of equipment involved in the mishap (e.g. dump truck (off highway), crane (rubber tire), pump truck (concrete), etc.).
WAS HAZARDOUS MATERIAL SPILLED/RELEASED? - Mark appropriate block and list name(s) of any reportable quantities of hazardous materials spilled/released during the mishap.
WHO PROVIDED FIRST AID OR CLEAN-UP OF MISHAP SITE? - List name(s) of individual(s) and employer, if known.
ANY BLOOD-BORNE PATHOGEN EXPOSURE, OTHER THAN EMT? - Mark appropriate block and list name(s) of individual(s) and employer, if known.
LIST OSHA AND/OR EM 385-1-1 STANDARDS THAT WERE VIOLATED. - Self explanatory.
WAS SITE SECURED AND WITNESS STATEMENT TAKEN IMMEDIATELY? - Mark appropriate block and list by whom.

SECTION 6 - INJURY/ILLNESS/FATALITY INFORMATION

SERVERITY OF INJURY/ILLNESS – Mark appropriate box.
ESTIMATED DAYS LOST - Enter the estimated number of workdays the person will lose from work. Update when final data is known.
ESTIMATED DAYS HOSPITALIZED - Enter the estimated number of workdays the person will be hospitalized. Update when final data is known.
ESTIMATED DAYS RESTRICTED DUTY - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties. Update when final data is known.
BODY PART(S) AFFECTED - Enter the most appropriate primary and when applicable, secondary, etc. body part(s) affected (e.g. arm: wrist: abdomen: single eye; jaw : both elbows: second finger: great toe: collar bone: kidney, etc.).
NATURE OF INJURY/ILLNESS FOR PRIMARY BODY PART - Enter the most appropriate nature of injury/illness (e.g. amputation, back strain, dislocation, laceration, strain, asbestosis, food poisoning, heart conditions, etc.).
TYPE AND SOURCE OF INJURY/ILLNESS - Type and Source Codes are used to describe what caused the incident.
(1) TYPE Code stands for an "Action" (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Type Code: Fell different levels".) Select the most appropriate Type of injury from the list below:

TYPE OF INJURY/ILLNESS

STRUCK BY/AGAINST	CONTACTED CONTACTED WITH (INJURED PERSON MOVING) CONTACTED BY (OBJECT WAS MOVING)
FELL, SLIPPED, TRIPPED SAME LEVEL/DIFFERENT LEVEL/NO FALL	EXERTED LIFTED, STRAINED BY (SINGLE ACTION) STRESSED BY (REPEATED ACTION)
CAUGHT ON/IN/BETWEEN	EXPOSED INHALED/INGESTED/ABSORBED/EXPOSED TO
PUNCTURED, LACERATED PUNCTURED BY/CUT BY/STUNG BY/BITTEN BY	TRAVELING IN

(2) SOURCE Code stands for an "object or substance." (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Source Code: "Ladder".) Select the most appropriate Source of injury from the list below:

SOURCE OF INJURY/ILLNESS

BUILDING OR WORKING AREA WALKING/WORKING AREA STAIRS/STEPS LADDER FURNITURE BOILER/PRESSURE VESSEL EQUIPMENT LAYOUT WINDOWS/DOORS ELECTRICITY	DUST, VAPOR, ETC. DUST (SILICA, COAT, ETC.) FIBERS ASBESTOS GASES CARBON MONOXIDE MIST, STEAM, VAPOR, FUME WELDING FUMES PARTICLES (UNIDENTIFIED)

ENVIRONMENT CONDITION TEMPERATURE EXTREME (INDOOR) WEATHER (ICE, RAIN, HEAT, ETC.) **FIRE, FLAME, SMOTE (NOT TABACCO)** NOISE RADIATION LIGHT VENTILATION TOBACCO SMOKE STRESS (EMOTIONAL) CONFINED SPACE	CHEMICAL, PLASTIC, ETC. DRY CHEMICAL - CORROSIVE DRY CHEMICAL - TOXIC DRY CHEMICAL - EXPLOSIVE DRY CHEMICAL - FLAMMABLE LIQUID CHEMICAL - CORROSIVE LIQUID CHEMICAL - TOXIC LIQUID CHEMICAL - EXPLOSIVE LIQUID CHEMICAL - FLAMMABLE PLASTIC WATER MEDICINE
MACHINE OR TOOL HAND TOOL (POWERED: SAW, GRINDER, ETC.) HAND TOOL (NON POWERED) MECHANCIAL POWER TRANSMISSION APPARATUS GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK) VIDEO DISPLAY TERMINAL PUMP, COMPRESSOR, AIR PRESSURE TOOL HEATING EQUIPMENT WELDING EQUIPMENT	INANIMATE OBJECT BOX, BARREL, ETC. PAPER METAL ITEM, MINERAL NEEDLE GLASS SCRAP, TRASH, WOOD FOOD CLOTHING, APPAREL, SHOES
MACHINE OR TOOL HAND TOOL (POWERED: SAW, GRINDER, ETC.) HAND TOOL (NON POWERED) MECHANCIAL POWER TRANSMISSION APPARATUS GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK) VIDEO DISPLAY TERMINAL PUMP, COMPRESSOR, AIR PRESSURE TOOL HEATING EQUIPMENT WELDING EQUIPMENT	INANIMATE OBJECT BOX, BARREL, ETC. PAPER METAL ITEM, MINERAL NEEDLE GLASS SCRAP, TRASH, WOOD FOOD CLOTHING, APPAREL, SHOES
VEHICLE AS DRIVER OF PRIVATELY OWNED, RENTAL VEH. AS PASSENGER OF PRIVATELY OWNED, RENTAL VEH. DRIVER OF GOVERNMENT VEHICLE PASSENGER OF GOVERNMENT VEHICLE COMMON CARRIER (AIRLINE, BUS, ETC.) AIRCRAFT (NOT COMMERCIAL) BOAT, SHIP, BARGE	ANIMATE OBJECT DOG OTHER ANIMAL PLANT INSECT HUMAN (VIOLENCE) HUMAN (COMMUNICABLE DISEASE) BACTERIA, VIRUS (NOT HUMAN CONTACT)
MATERIAL HANDLING EQUIPMENT EARTHMOVER (TRACTOR, BACKHOE, ETC.) CONVEYOR (FOR MATERIAL AND EQUIPMENT) ELEVATOR, ESCALATOR, PERSONNEL HOIST HOIST, SLING CHAIN, JACK CRANE FORKLIFT HANDTRUCK , DOLLY	PERSONAL PROTECTIVE EQUIPMENT PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES RESPIRATOR, MASK DIVING EQUIPMENT SAFETY BELT, HARNESS PARACHUTE

SECTION 7 - CAUSAL FACTORS

Review thoroughly. Answer each question by marking the appropriate block. **NOTE!** If any answer is yes, explain in section 5 above.

(1) **DESIGN** - Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
(2) **INSPECTION/MAINTENANCE** - Did inadequately or improperly maintained equipment, tools, workplace, etc., create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
(3) **PERSONS PHYSICAL CONDITION** - Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was overexertion a factor?
(4) **OPERATION PROCEDURES** - Did lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
(5) **JOB PRACTICES** - Were any of the provision of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?
(6) **HUMAN FACTORS** - Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person: i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach strengths, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
(7) **ENVIRONMENTAL FACTORS** - Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun temperature changes, wind, tides, floods, currents, terrain; dust, mud, glare, pressure changes, lighting, etc., play a part in the accident?

(8) **CHEMICAL AND PHYSICAL AGENT FACTORS** - Did exposure to chemical agents (either single shift exposure or long-term exposure such as dusts, fibers, (asbestos, etc.), silica, gases (carbon, monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?
(9) **OFFICE FACTORS** - Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?
(10) **SUPPORT FACTORS** - Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized and adequate to provide proper tools, equipment, personnel, site preparation, etc.
(11) **PERSONAL PROTECTIVE EQUIPMENT** - Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?
(12) **DRUGS/ALCOHOL** - Is there any reason to believe the person's mental or physical capabilities, judgment, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".
(13) **JOB/ACTIVITY HAZARD ANALYSIS** - Was a written Job/Activity Analysis completed for the task being performed at the time of the accident? If one was made, did it address the hazard adequately or does it need to be updated? If none made, will one be made? These may also need to be addressed in the Corrective Actions Taken section. Mark the appropriate box. If one was made, attach a copy of the analysis to the report.
(14) **MANAGEMENT** - Did the lack of supervisor or management support play a part in the mishap? Mark the appropriate box.

SECTION - 8 OSHA INFORMATION - Complete this section if applicable

SECTION 9 - REPORT PREPARER

Providing a completed CSIR to the Contracting Officer is the PRIME CONTRACTOR'S RESPONSIBILITY. Enter the name, date of report, title, employer, phone number and signature of person completing the accident report and provide it to the Contracting Officer, or his representative, responsible for oversight of that contractor activity. **NOTE!** If prepared by other than the Prime Contractor, a person employed by the Prime Contractor must sign that they have reviewed and concur with the report and it's findings (e.g. company owner, project supervisor/foreman, Safety Officer, etc.).

APPENDIX F

MEDICAL DATA SHEET

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This Medical Data Sheet must be completed by on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project _____

Name _____ Home Telephone_____

Address _____

Age _____ Height _____ Weight _____

Person to notify in the event of an emergency: Name: _____

Phone: _____

Drug or other Allergies:_____

Particular Sensitivities:_____

Do You Wear Contacts? _____

What medications are you presently using?_____

_____

Name, Address, and Phone Number of personal physician: _____

_____

_____

Note: Health Insurance Portability and Accountability Act (HIPAA) Requirements

HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires TTEC to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form will not be maintained in a secure location. It will be maintained in a file box or binder accessible to other members of the field crew so that they can accompany an injured party to the hospital.

DO NOT include information that you do not wish others to know, only information that may be pertinent in an emergency situation or treatment.

_____ _____ _____

Name (Print clearly) Signature Date

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APPENDIX G

HAZARDOUS MATERIAL INVENTORY AND MATERIAL SAFETY DATA SHEETS/SAFETY DATA SHEETS (preliminary)

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Product or Material Name [1/]	**Primary Hazards**	**Quantity Maintained Onsite**	**Total Quantity Required (*estimated*)**	**Operation(s) material used for**	**Container Size and Type**	**Location Stored***
Gasoline, unleaded (supplier and grade may vary)	Flammable Liquid, Vapors	Up to 10 gallons	Up to 50 gallons	Refueling and operation of small gasoline powered equipment (mowers, generators, etc.)	5 gallon UL and DOT listed metal fuel containers	Flammable storage locker in designated flammable material storage area
Motor Oil (supplier and grade may vary)	Petroleum Product, non-flammable	1quart to 1 gallon	Up to 2 gallons	Routine maintenance and upkeep of small gasoline powered equipment	Pint to quart size in manufacturer's container (as purchased)	Maintenance supply area or flammable storage locker away from flammable materials
Bentonite	May contain crystalline silica	To be determined	To be determined	Well/piezometer installation	40-60 pound bags	Driller laydown area (to be determined)
Spray Paint (various brands or colors)	Flammable Aerosol, Vapors	1-2 cans	1-2 cans	Marking vegetation or ground (as required)	16 oz. spray can, metal	Flammable storage locker in designated flammable material storage area

* Material will only be stored onsite during active work tasks. Only the minimum quantity required for immediate use will be stored.

[1/] MSDS or SDS will be obtained and added when the product manufacturer and product specifications become known

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APPENDIX C

MILLIKEN® CONCRETE CLOTH™ INSTALLATION GUIDE

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Milliken®

Concrete Cloth™

INSTALLATION GUIDE

Geosynthetic Concrete Composite Mat

Licensed from

CONCRETE CANVAS®

Milliken™ | Milliken Infrastructure Solutions, LLC

Milliken®

Concrete Cloth™

Overview

This document provides guidance for the installation of Milliken's Concrete Cloth under field conditions. Final details for any installation of Concrete Cloth is the responsibility of the end user.

Concrete Cloth cannot be overhydrated. For this reason the product may be installed in the rain without a problem. It can also be installed in winter areas because of the ease and speed of installation. The product should be installed at a temperature above freezing. If the temperature is expected to drop well below freezing after the install, insure that it is insulated and the heat of hydration will continue the curing process.

The proper installation of Concrete Cloth is essential to achieving optimal performance and durability. The guidelines detailed in this document are intended to aid in understanding the preferred methods for preparing the project for installation of Concrete Cloth, and for the installation of Concrete Cloth in different applications. Individual projects will vary and so it is important to use this guide in conjunction with project specific details and procedures.

It is the responsibility of the project contractors to insure safe work practices are followed in the use of Concrete Cloth and all installation equipment. The installation contractor is expected to comply with all regulatory codes for the work site including but not limited to OSHA (Occupational Health and Safety Administration) and use all required PPE (Personal Protective Equipment).

Contents

Inspection and Offloading 1
Subgrade Preparation 3
Installation 4
Seams and Overlaps 6
Anchoring 8
Hydration 9
Vertical / Overhead Installation 10

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Inspection and Offloading

Concrete Cloth will be delivered to the job site on pallets. There are three (3) thicknesses of Concrete Cloth currently available. Depending on the size of the rolls ordered, the Concrete Cloth will be stacked in multiple rolls or in a single roll on the delivered pallet. Smaller rolls referred to as batch rolls may be delivered stacked as multiple rolls on a pallet. Larger rolls referred to as bulk rolls will be delivered one (1) roll to a pallet. *See chart below.*

Concrete Cloth rolls come individually wrapped in plastic. It is important to check the wrapping when Concrete Cloth rolls arrive to the jobsite. Unopened Concrete Cloth rolls can be stored in a dry location, off the ground, and away from moisture for up to one year. Any damage to the packaging should be repaired prior to storage using plastic wrap and tape to protect the Concrete Cloth from premature hydration.

Batch Roll Offloading

Batch rolls come individually wrapped in plastic and are of a weight *(see below)* such that the rolls can be unloaded and moved by two men.

Size Specifications

CC THICKNESS	ROLL SIZE	AREA (SF)	LENGTH (FT)	WEIGHT (LBS)	WIDTH (FT)	ROLLS/PALLET
CC5	Batch	105	30	147	3.5	1-10
CC5	Bulk	2152	615	3013	3.5	1
CC8	Batch	54	15	135	3.6	1-10
CC8	Bulk	1343	373	3358	3.6	1
CC13	Bulk	860	239	3354	3.6	1

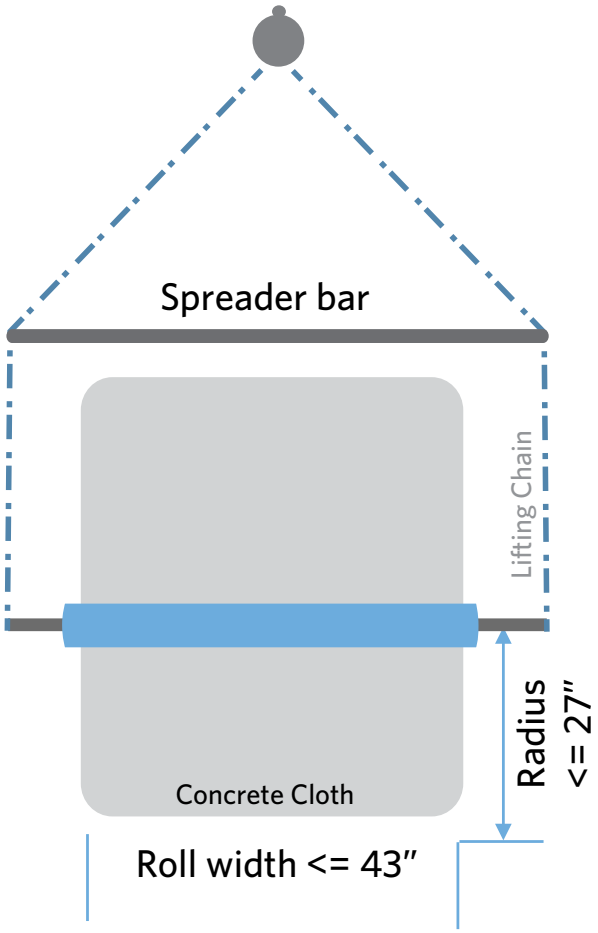
Bulk Roll Offloading

Bulk rolls are of a weight that lifting equipment will be required for offloading and roll movement. Appropriately forked lifts can be used to move palletized rolls to the desired location. A spreader bar can be used to remove the Concrete Cloth roll from the pallet and to aid in the placement of the Concrete Cloth. When lifting bulk Concrete Cloth rolls, all personnel should remain well clear of the lifted roll to avoid injury.

Spreader Bar

When using a spreader bar to transport bulk Concrete Cloth rolls, it is important to insure

1) the bar is capable of carrying the load
2) is placed unimpeded through the core of the Concrete Cloth
3) is well fastened on either side of the roll
4) can be adjusted to be level
5) does not restrict unwinding of the roll.



Subgrade Preparation

Compacted and smooth subgrade should be prepared to engineering specifications prior to placement of the Concrete Cloth. Subgrade should be prepared to the lines and tolerances of the engineered drawing for the installation. Soil should be clear of surface vegetation, debris, rocks, and branches. While not required for many applications, uneven subgrade may create voids beneath the Concrete Cloth which may reduce it's support. To the extent possible, Concrete Cloth should be in intimate contact with the sub-surface to which it is being applied. If the grade upon which the Concrete Cloth is placed contains ridges, bumps, or valleys, these features will be visible once the Concrete Cloth is installed.

When installing Concrete Cloth in underwater applications, it is the contractors responsibility to do appropriate testing to insure appropriate subgrade preparation. Once placed in an underwater application, Concrete Cloth will begin hydrating immediately and subsequent modifications to the subgrade may be time limited *(working time once hydrated is approximately 2hrs)*.

Installation

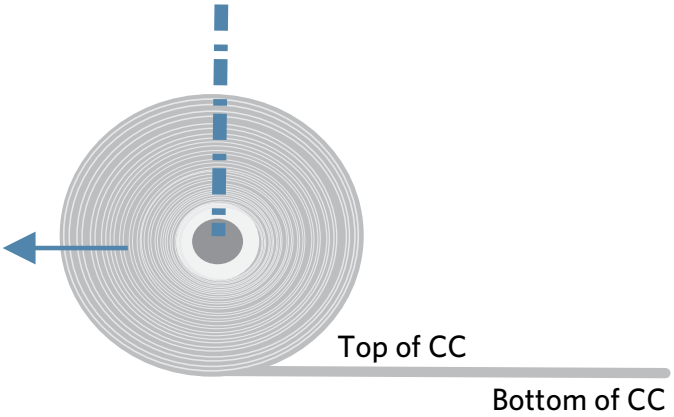
Concrete Cloth Placement

Because of the nature of the overlap design used in many Concrete Cloth installations, typical installation will begin at the lowest point of the project and proceed up the grade. A 'shingled' installation overlapping the Concrete Cloth rolls is used to reduce any water seepage between the overlapped rolls.

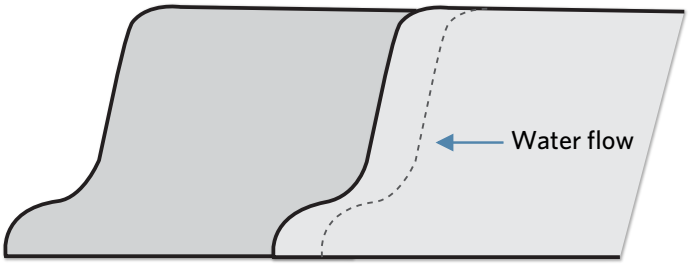
Concrete Cloth is designed such that the PolyVinylChloride (PVC) back of the material will be against the subgrade in almost all applications. This side is water resistant and will not allow subsequent hydration if the material is installed upside down. The PVC back side is easily identifiable because it is a continuous film on the Concrete Cloth material. Additionally Concrete Cloth is batched into rolls such that the PVC backside will always be on the outside of the roll. For this reason when placing Concrete Cloth from rolls it is important to let the fabric off from the bottom side of the roll.

Top of CC

Bottom of CC



When using bulk rolls, it is important to insure that the roll is well centered on the spreader bar so that the material will unroll more easily. Temporary anchoring may be used on the leading edge to aid in the unrolling of the roll from the spreader bar. In applications where long lengths will be let off the roll, it is a good practice to allow several feet of extra material on the down-slope side of the install to allow for migration of the material in direction of equipment movement.



After installation of the first roll, the leading edge of the second roll will typically be 'shingled' over the first for the reasons mentioned above. In certain applications special joints and seams may be used rather than the 'Shingle' method *(these are discussed in subsequent sections of this guide)*.

Installation

Cutting Concrete Cloth

Often times the Concrete Cloth material will need to be cut to a specified length, or to conform to the installation area. Concrete Cloth is designed to be cut with commonly available cutting tools. A 'box cutter' or 'razor knife' will work well in making cuts in the Concrete Cloth. Always use appropriate hand PPE when working with cutting tools.

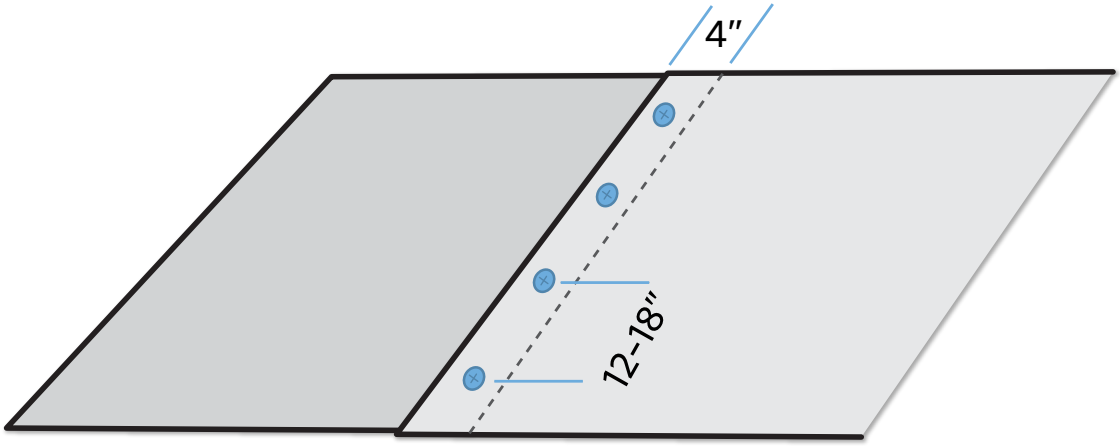
To make the cut simply place the Concrete Cloth onto a desirable cutting surface. A piece of plywood will make a good cutting surface. The use of the cutting surface is to protect the tool and result in a clean Concrete Cloth edge. It is completely possible to make cuts in the Concrete Cloth after installation, assuming it can be done safely. Place the backside of the Concrete Cloth *(this is the side with the PVC backing)* down in contact with the cutting surface. Always cut Concrete Cloth from the top side of the material *(non PVC coated side)* when possible. This will minimize any tearing of the PVC backing.

Seams and Overlaps

As previously discussed in many applications a simple 'Shingle' technique is quite sufficient for overlapping as you work up the slope. When using multiple widths side by side 'on grade' other techniques of seaming and overlap may be required.

Overlap Seaming with screws

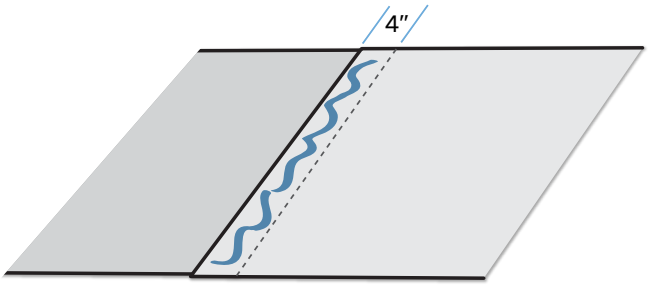
In this technique one of the Concrete Cloth rolls is overlapped approximately four inches (4″) atop the other roll. A stainless steel #12 screw is used to fasten the two rolls together. One screw is placed every linear foot along the cloth. The screw is located more than one inch (1″) from the overlapped edge of the upper roll.



Seams and Overlaps

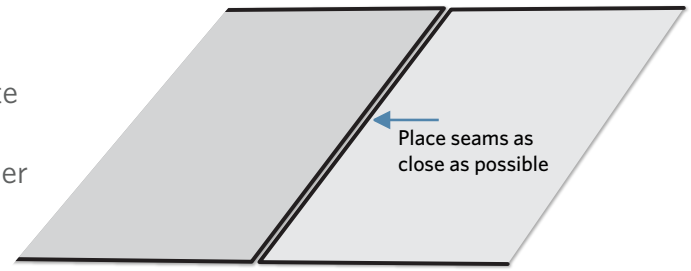
Overlap Seaming with adhesives

In this technique one of the Concrete Cloth rolls is overlapped approximately four inches (4″) atop the other roll. The edge of the top layer is then pulled back and a bead of adhesive is laid, centered in the overlap. The adhesive chosen will depend on the performance requirements and environment the seam is expected to experience. This seam may be desirable when a lower joint permeability is desired.



Butt Joint Seams

Butt joint seams are typically not recommended but may be required in certain applications. When producing a butt joint seam it is important to insure that the two rolls to be joined are as parallel to one another as is possible. After initial installation of the rolls to be seamed, fine tune adjustment along the length of the seam may be required to eliminate gaps and overlaps. It must be noted that in most installations a butt joint seam will be prone to higher levels of leakage at the seam joint.



Anchoring

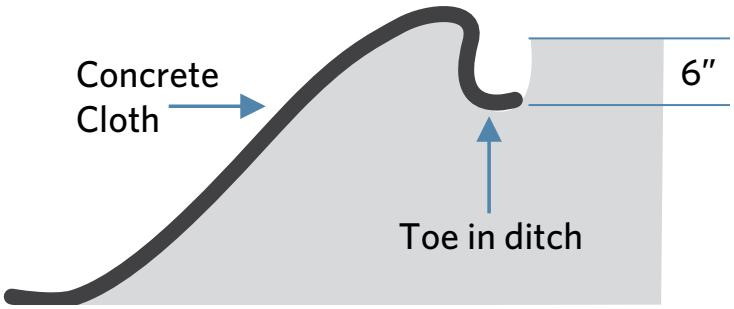
Soil Anchors and Soil Nails

Some soil slopes and soil types may require anchors or nails to stabilize the underlying soil mass against internal instability. There are several producers of soil anchors, soil nails, and other stabilization devices. Concrete Cloth may be used as the non-structural facing treatment when internal anchorage conditions are required. Anchors may be installed first, then covered with Concrete Cloth, or the Concrete Cloth may be installed first and the anchors inserted through the cloth.

Toe-In Trenching

Along all exterior edges (top, bottom, and sides) of the Concrete Cloth installation, it is recommended to install a toe-in trench (minimum 6 inches in depth) to resist migration of surface water between the Concrete Cloth and the subgrade. This toe-in trench may vary in location and depth depending upon site conditions including soils, sub-grade, and recommendation of the design engineer.

Depending upon the job site and equipment accessibility before and after Concrete Cloth installation, it may be preferable to dig the toe-in trench prior to laying the Concrete Cloth. Should the edge of the Concrete Cloth installation not line up exactly with the toe-in trench, adjustments can usually be made with a simple hand shovel.



Hydration

Complete hydration of the Concrete Cloth is critical to optimal performance. Concrete Cloth cannot be overhydrated and incomplete hydration may result in reduced strength of the product. Hydration can be done with virtually any water source. Salt water and or dirty water will not have a negative effect on the performance of the product in most circumstances.

To hydrate Concrete Cloth

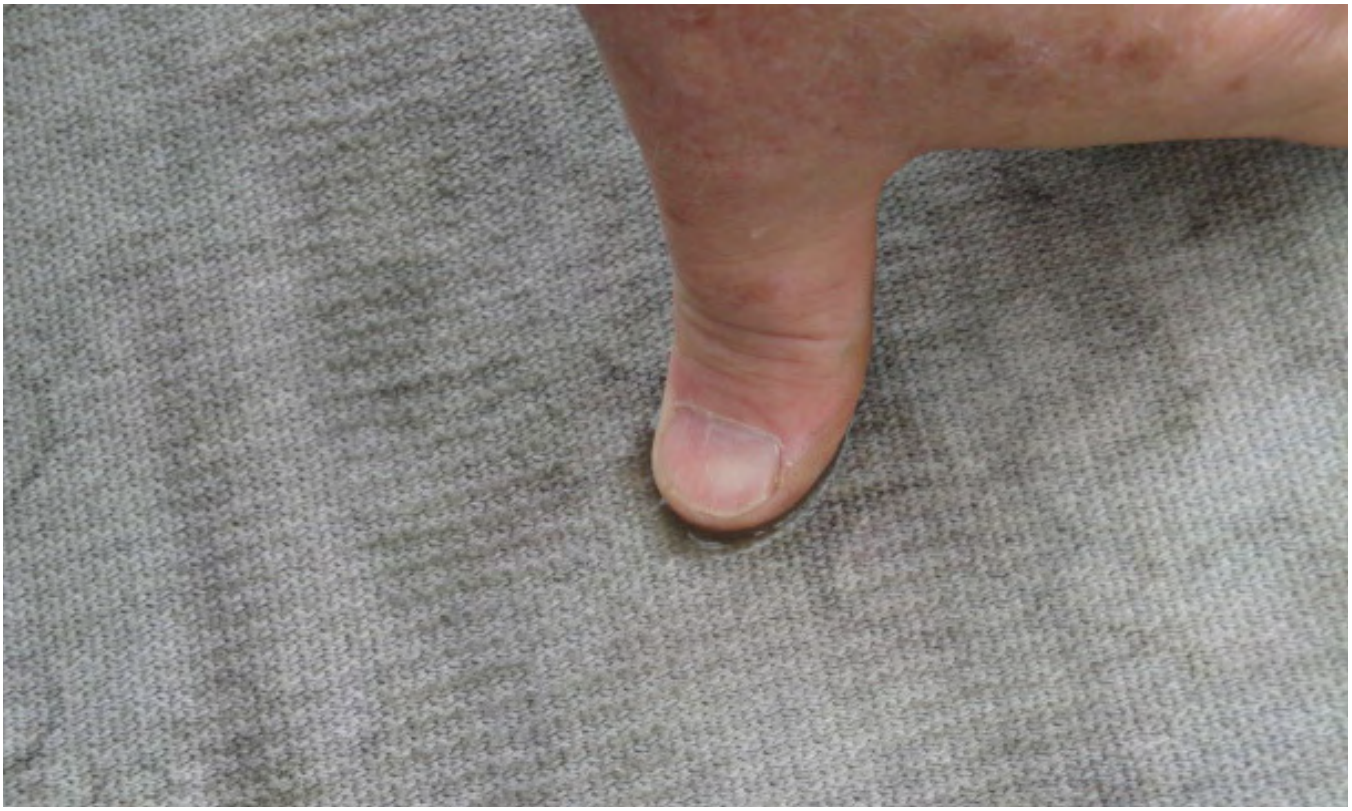
1) Saturate the top-side of the Concrete Cloth material. This will take multiple passes of a moderate spray of water from a garden hose or other source.

   Note: More water will be required to saturate the product as the slope of the installation increases.

2) Insure that the Concrete Cloth has been saturated by means of the "thumb test", where a thumb is pressed into the Concrete Cloth and water is observed to pool in the indentation.

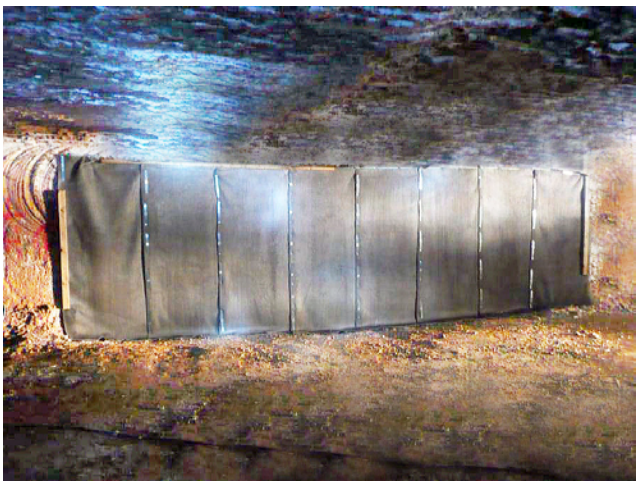
3) Wait 30-60 minutes then put a final dose of water onto the Concrete Cloth to insure complete hydration.

In special applications where it is important not to allow excess water runoff, or water is scarce; water troughs of appropriate size may be used. Submerge the Concrete Cloth in the filled trough for a period of 5-10 minutes, remove and install.



Vertical and Overhead Installation

Placing Concrete Cloth in vertical and / or overhead applications provides significant challenges. Gravity and the flow of water make hydration of installations in vertical and overhead applications more difficult after installation. For this reason it is recommended when possible to hydrate the Concrete Cloth in small sections prior to installation. This will significantly increase the weight of the material to be installed so it is very important to plan the install in sections which can be easily managed into position.



In situations where hydration prior to installation cannot be done it is possible to hydrate the Concrete Cloth in a vertical installation; however, this hydration requires an extended period of time and a lower spray velocity. Additionally 80% of the hydration should take place in the top 1/3 of the installed material as gravity will allow the water to flow to the lower part of the install. Hydration of an installed overhead Concrete Cloth piece is not possible.

APPENDIX D

QUALITY CONTROL DOCUMENTS

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TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

TEST PLAN and LOG

Task Order Number: _____ Task Order Manager: _____
Project _____ Location: _____

Spec. Section	Paragraph No.	Test Procedure	Test Name	Test Frequency	Test Responsibility	Tested By	Date Completed	Remarks

TETRA TECH EC, INC.

CONTRACTOR PRODUCTION REPORT

Date:

Contract No.	Title & Location:	Report No.
N62470-13-D-8007		

Contractor:	Superintendent:
AM Weather:	PM Weather:

Work Performed Today

Work Location & Description	Employer	Number	Trade	Hours

Was a job safety meeting held this date? (If yes, attach a copy of meeting minutes.)	Yes: No:		Total work hours on site this date:	0.0
Were there any lost time accidents this date? (If yes, attach a copy of completed OSHA report.)	Yes: No:		Cumulative work hours from previous report:	
Was trenching/scaffolding/HV electrical/high work done this date? (If yes, attach statement or checklist showing inspection performed.)	Yes: No:			
Was hazardous material/waste released to the environment? (If yes, attach description of incident and proposed action.)	Yes: No:		Cumulative work hours since start of work:	

List safety actions taken today/safety inspections conducted:

Remarks:

Contractor Superintendent

Date

CONTRACTOR PRODUCTION REPORT

Date: 1/0/1900

Contract No.	Title & Location:	Report No.
N62470-13-D-8007		0

Rental Equipment	Vendor	PO/MOA#	Charge #	Start Date	Rate	Daily Hrs	P.O.P. Expires

Materials	Vendor	PO #	Charge #	QTY REC'D	ACCUM QTY	P O QTY	P.O.P. Expires

Contractor Superintendent

01/00/00
Date

TETRA TECH EC, INC	REPORT NO:	
NAVFAC MIDLANT REMEDIAL ACTION CONTRACT (RAC VI) CONTRACT NO. N62470-13-D-8007	PROJECT: PROJECT NO: SUBCONTRACTOR: LOWER TIER SUB:	
CONTRACTOR QUALITY CONTROL REPORT	DATE: TASK: LOCATION	

SEE CONTRACTOR DAILY PRODUCTION SUMMARY REPORT FOR INFORMATION ON SAFETY, WEATHER, SUBCONTRACTOR HOURS AND AREAS OF RESPONSIBILITY:

SUMMARY OF CONSTRUCTION PROGRESS AND QUALITY CONTROL ACTIVITIES PERFORMED:

Tests Performed and Results:

Materials Received:

Deficiencies Noted with Proposed or Implemented Corrective Action:

JOB SAFETY: (LIST OBSERVATIONS)

COMMENTS: ADDRESS ANY CHANGES (FCR/DCN), MEETING RESULTS OR OTHER INFORMATION

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials used and work performed during this reporting period are in compliance with the contract plans and specifications to the best of my knowledge, except as may be noted above.

NAME:	TITLE/COMPANY: PQCM
SIGNATURE:	DATE:

DEFICIENCY NOTICE

TASK ORDER # _____ DN # _____ DATE _____

LOCATION: _____ ROICC / RPM

1. Plan, Procedure, Specificaion, or Drawing (Clearly state the requiremet)

2. Description of Deficiency

QC verification of corrective action required: **Yes** _____ **No** _____

Prepared by: _____ **Approved by:** _____

3. Corrective Action

_____ _____ _____

Organization Signature Date

4.

Corrective action verified by: _____ Date _____

Comments:

_____ _____

Program Quality Control Manager Date

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

DESIGN CHANGE NOTICE (DCN)

TASK ORDER # _____ DCN # _____ DATE _____

LOCATION _____ ROICC / RPM _____

1. Document to be changed. Identify revision, date, section, drawing, etc.

2. Description of Change (Items involved, submit sketch, if applicable): **(Use continuation sheet if necessary)**

Engineering "HOLD" placed on all activities in area defined herein pending receipt of formally revised document(s) and / or DCN.
Released for construction basis of modifications prescribed by this DCN.

3. Reason for Change **(Attach additional information if nedded)**

4. Originator (Print name and sign)		Title	Date
Reviewed by: (Print name and sign)		Title	Date
Task Order Manager (Print name and sign)	Date	Program Quality Manager (Print name and sign)	Date

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

DESIGN CLARIFICATION REQUEST

TASK ORDER # _____ **DC#** _____ **DATE** _____

Submitted to: _____

1. Document reference. Identify revision, date, section, drawing, etc.

2. Clearly state requirement or describe drawing as shown. (Attach additional info if needed)

3. Information requested or proposed change. (Attach additional information if needed)

4. Response

Does response require an FCR or DCN **YES** ☐ **NO** ☐

FCR ☐ **DCN** ☐

Task Order Manager (Print name and sign)	**Date**

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

FIELD CHANGE REQUEST (FCR)

TASK ORDER # _____ FCR # _____ DATE _____
LOCATION: _____ ROICC / RPM _____

1. Document to be changed. Identify revision, date, section, drawing, etc.

2. Description of existing requirement and proposed change (Attach sheet if necessary)

3. Reason for Change (Attach sheet if necessary)

4. Originator: (print name and sign)		**Title**	**Date**
Reviewed by: (print name and sign)		**Title**	**Date**
Site Superintendent (Print name and sign)	**Date**	**Task Order Manager (Print name and sign)**	**Date**
TtEC Program QC Manager (Print Name and Sign)	**Date**	**NTR Acknowledgement (Print name and sign)**	**Date**

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

Initial Phase Inspection Checklist

Task Order No.: _____ Date: _____
Definable Feature: _____ Spec Section: _____

I. Personnel Present:

	Name	Position	Company / Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

(List additional personnel on reverse side)

II Identify full compliance with procedures identified at preparatory inspection. Coordinate plans, specifications, and submittals.
Comments:

III Preliminary Work. Ensure preliminary work is complete and correct. If not, what action is taken?
Actions:

IV Establish Levels of Workmanship

1. Where is the work located? _____
2. Is a sample panel required? Yes _____ No _____
3. Will the initial work be considered as a sample? Yes _____ No _____
   (If yes, maintain in present condition as long as possible.)

V Resolve any differences.
Comments:

VI Check Safety

Initial Phase Inspection Checklist

Review job conditions using Site Health and Safety Plan and job hazard analysis.
Comments:

_____
Site CQC Representative

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT (RAC VI)
CONTRACT NO. N62470-13-D-8007

Initial Phase Inspection Checklist

Task Order No.: _____ Date: _____
Definable Feature: _____ Spec Section: _____
EFA Northwest Notified _____ Hours in Advance Yes ____ No ____

I. Personnel Present:

	Name	Position	Company / Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

(List additional personnel on reverse side)

II Identify full compliance with procedures identified at preparatory inspection. Coordinate plans, specifications, and submittals.

Comments _____

III Preliminary Work. Ensure preliminary work is complete and correct. If not, what action is taken?

_____

IV Establish Levels of Workmanship

1. Where is the work located? _____
2. Is a sample panel required? Yes _____ No _____
3. Will the initial work be considered as a sample? Yes _____ No _____
   (If yes, maintain in present condition as long as possible.)

V Resolve any differences.

Comments _____

VI Check Safety

Review job conditions using Site Health and Safety Plan and job hazard analysis.

Initial Phase Inspection Checklist

Comments: _____

_____

_____

_____
Site CQC Representative

TETRA TECH EC
NAVY REMEDIAL ACTION CONTRACT (RAC) VI
CONTRACT NO. N62470-13-D-8007

MONITORING DEVIATION FORM

Task Order # _____ **Date** _____

Project Name _____

Type of Sample _____

Sample Identification # _____ **Sampling Event** _____

_____
Field Representative

_____ _____
Project Manager **NAVFAC NTR**

Description of Deviation or Changed Condition: (State Project Requirement and Deviation)

ALTERNATE ACTION:

NAVFAC NW Response:

_____ _____
RPM Signature **Date**

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

MONTHLY REWORK ITEMS LIST

Task Order Number: _____ Project: _____ Date: _____

Number	Identification of item requiring rework	Date Identified	Date Corrected	Remarks

_____
Site CQC Representative Date

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

NONCONFORMANCE REPORT

TASK ORDER # _____ NCR# _____ DATE _____
LOCATION: _____ ROICC/RPM

1. Plan, Procedure, Specification, or Drawing (Clearly state the requiremet)

2. Description of Nonconforming Item or Condition

Did nonconforming condition require suspension of work activities Yes ☐ No ☐
If yes, explain requirement to restart work activities: _____

Prepared by:	Title	Date

3. Corrective Action

- ☐ use-as-is
- ☐ repair
- ☐ rework to specificaion
- ☐ other - specify: _____

Comments:

Organization	Signature	Date

NONCONFORMANCE REPORT

Evaluator _____ Title _____

Accept	
Accept with comments	
Reject	
Reject with comments	

Comments:

Signature _____ Date _____

Evaluator _____ Title _____

Accept	
Accept with comments	
Reject	
Reject with comments	

Comments:

Signature _____ Date _____

5. Verification

Verification required Yes ☐ No ☐

Verified by: _____ Signature _____ Title _____ Date

Approved by: _____ Program QC Manager _____ Date

Preparatory Inspection Checklist

Task Order No.: _____ Date: _____

Definable Feature: _____ Spec Section: _____
ROICC Notified _____ ____ ____

I Permits
Have all necessry permits been obtained? Yes ____ No ____

Are the permits on site? Yes ____ No ____

II Sampling Process
Is all sampling equipment on site? Yes ____ No ____

Are sampling labels on site? Yes ____ No ____

Are COCs on site? Yes ____ No ____

Do sampling personnel clearly understand the sample identification procedure? Yes ____ No ____

Has sampling decon procedures been established? Yes ____ No ____

Are proper sample preservation procedures in place? Yes ____ No ____

Has the laboratory been notified of sample shipment? Yes ____ No ____

Has waste disposal processes been established? Yes ____ No ____

Do sampling personnel understand the sampling procedures? Yes ____ No ____

Comments:

VII Safety

1. Review applicable portion of the Task Order Site Health and Safety Plan.
Comments

2. Activity Hazard Analysis approved? Yes ___X___ No _____

VIII Navy comments during meeting.

Preparatory Inspection Checklist

I. Personnel Present:

	Name	Position	Company / Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	(List additional personnel on reverse side)		

Site CQC Representative

Preparatory Inspection Checklist

Task Order No.: _____ Date: _____
Definable Feature: _____ Spec Section: _____
EFA Northwest Notified _____ Hours in Advance Yes ____ No ____

I. Personnel Present:

	Name	Position	Company / Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

(List additional personnel on reverse side)

II Submittals

1. Review submittals and/or submittal register. Have all applicable submittals been approved?
   Yes _____ No _____

   If No, what items have not been submitted?

   a. _____
   b. _____
   c. _____

2. Are all materials on hand? Yes _____ No _____

   If No, what items are missing?

   a. _____
   b. _____
   c. _____

3. Check approved submittals against delivered materials. (This should be done as materials arrives.)

Comments _____

III Material Storage

Are materials stored properly? Yes _____ No _____

Preparatory Inspection Checklist

If No, what actions is taken? _____

IV Specifications

1. Review each paragraph of Specification

_____

2. Discuss procedure for accomplishing the work.

_____

3. Clarify any differences.

_____

V Preliminary Work and Permits

Ensure preliminary work is correct and permits are on file. Yes _____ No _____

If No, what action is taken? _____

VI Testing

1. Identify test to be performed, frequency, and by whom. _____

2. When required? _____

3. Where required? _____

4. Review testing play. _____

5. Has test facilities been approved? _____

VII Safety

1. Review applicable portion of the Task order Site Health and Safety Plan.

_____

Preparatory Inspection Checklist

2. Activity Hazard Analysis approved? Yes _____ No _____

VIII Navy comments during meeting.

_____

Site CQC Representative

TETRA TECH EC, INC.
NAVY REMEDIAL ACTION CONTRACT
CONTRACT NO. N62470-13-D-8007

SUBMITTAL REGISTER

Contract Number: N62470-13-D-8007					Project Title:							Location:			
							Contractor Action			Approving Authority Action				Contracting Officer / Contractor	
Specification Section Number	SD No and Type of Submittal Material or product	Specification Paragraph Number	Classification / Approval By CO	Govt. or A/E Reviewer	Transmittal Control No.	Planned Submittal Date	Action Code	Date of Action	Date FWD to Approving Authority / Date recd From Contractor	Date FWD to other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor / Received from Approving Authority	Remarks
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)

Action Code: NR: Not Reviewed AN: Approved as Noted A: Approved RR: Disapproved; Revise and Resubmit (Others may be prescribed by Transmittal Form)